Proceedings of the 2nd Annual Conference of Engineering and Implementation on Vocational Education (ACEIVE)

3 November 2018, Universitas Negeri Medan, North Sumatra, Indonesia

ACEIVE 2018

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Preface

The 2nd Annual Conference of Engineering and Implementation on Vocational Education (ACEIVE) is a scientific forum for scholars to disseminate their research and share ideas. This conference will take place at the DigiLib Unimed, North Sumatera Province, Indonesia, on 03 November 2018. The ACEIVE’s theme is Engineering and Application for Industry 4.0. This conference will be an annual event hosted by Faculty of Engineering, Universitas Negeri Medan, Indonesia.

“Engineering and Application for Industry 4.0” has been chosen at the main theme for the conference, with a focus on the latest research and trends, as well as future outlook of the field of Call for paper fields to be included in ACEIVE 2018 are: Electrical Engineering, Civil and Environmental Engineering, Food and Agriculture Technology, Informatics Engineering and Educational Technology, Multimedia Learning, and Teaching on Vocational Education.

The conference invites delegates from across Indonesian and South East Asian region and beyond, and is usually attended by more than 100 participants from university academics, researchers, practitioners, and professionals across a wide range of industries.

S Sriadhi, Ph.D
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The Strategy for the Community Participation Development in the Management of Mangrove Forest Ecosystem in Muara Gembong District, West Java

Kirstie Imelda Majesty¹, Mahawan Karuniason², Herdis Herdiansyah³
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Abstract. Aquatic and terrestrial ecosystems along the northern coastline of Java Island form the mangrove forests into an ecosystem rich in interacting biodiversity, one of which is in Pantai Bahagia Village in Muara Gembong District, Bekasi Regency, West Java. From year 1999 to 2014, the mangrove forests in this village continued to experience degradation; mostly due to anthropogenic factors, namely the conversion of mangrove land into ponds by coastal communities which caused coastal erosion to continue to occur in this region, the absence of wave barriers, so that seawater intrusion became high, and the tidal flood which caused enormous losses for residents who mostly had livelihoods as pond farmers. Previous researches had indicated that the mangrove conditions in Pantai Bahagia Village are categorized as severely damaged and have low biodiversity conditions, so the urgency to carry out rehabilitation is classified as high. Until 2018 community participation has begun to emerge in rehabilitating mangrove forests, but is still relatively low and has not been able to match the rate of damage. A study was conducted on 30 Pantai Bahagia villagers who have a high level of concern and participation in managing mangroves to analyze the internal and external factors, which encourage or discourage community participation and develop strategies to increase community participation in rehabilitating mangrove Pantai Bahagia Village to formulate 5 (five) alternative strategies. The proposed solutions are evaluated based on those determinants, and the rank is calculated based on the implementation criteria, namely: effectiveness, cost, duration, and sustainability using AHP as a tool in the decision-making process in solving the problems with high complexity. It is determined that the prioritized alternative to be implemented in the community of Pantai Bahagia Village in Muara Gembong District is to held capacity building like workshop and training to develop alternative livelihood & income, as it is the most sustainable, economical, and effective alternative in encouraging the community willingness in voluntarily manage the mangrove ecosystem.

Keywords: Analytical Hierarchy Process analysis, community participation, mangrove rehabilitation, Muara Gembong District, West Java

1 Introduction

Mangrove systems form a crucial component of the livelihoods of coastal communities in developing countries, as they provide fish, crustaceans and other sea life for food and income; wood for fuel and energy; protection of shorelines from erosion, flooding and storm damage; and a filter for pollutants to help maintain water quality [1][2]. However, historical researches had stated that Indonesia’s mangrove area have experienced rapid change in the form of degradation and loss [3]–[6] due to the increase of human activity, especially from intensive and extensive commercial aquaculture in rural livelihoods [7]. It is estimated that Java Island alone had lost 75% of its original mangrove area from 1800 to 2012 [3]. Considering the importance of the role of mangroves to protect and conserve the ecosystem components of coastal and marine areas, the sustainability management of mangrove ecosystem is absolutely necessary [8].

From a geographical point of view, Bekasi Regency is very strategic for marine trade area because it is crossed by The Pantura (North Coast Line), the primary and densest ocean route in Java Island. From year 1999 to 2014, mangrove forests in this village continued to experience degradation due to anthropogenic factors, namely: the conversion of mangrove land into ponds by coastal communities which caused coastal erosion to continue to occur in this region, the absence of wave barriers that caused seawater intrusion, and tidal flood that caused enormous losses for residents who mostly had livelihoods as pond farmers [9]–[11].
At present, the remaining mangrove land only reaches 379 hectares or only 13.15% of the initial coverage area. The results of prior research shown that the average shoreline change in each coastal village in Muara Gembong has decreased by 346.54 ha to 349.56 ha due to erosion and sedimentation that occurred in Muara Gembong Subdistrict from 2000 to 2012 [12]. The most severe loss was land damage the pond which has been the main livelihood of fishers in Muara Gembong. Erosion that occurred at the coast of Muara Gembong could reduce the area of the pond and could have a negative impact on the economic sector. For example, due to water pollution and abrasion, aquaculture productivity decreases from time to time, caused by flood during tide, due to the lack of mangrove belt. During West Season (Musim Barat), communities of fishermen who do not actively catch fishes started to replant mangroves for livelihood purpose [13].

One of the factors causing the communities’ low interest in managing mangroves, is that there is still a lack of alternative livelihoods apart from the aquaculture sector so that mangroves continue to experience degradation and tidal floods continue to occur, thus harming local residents. In order to ensure the function of mangrove ecosystems run well for the environment as a whole in Pantai Bahagia Village, alternative strategies are needed to be prepared to encourage the community participation in managing mangrove forest ecosystems that are effective and based on sustainable environmental management principles, which cover ecological, economic, and social aspects. Thus, in-depth interview with the community to address the core problems to generate the alternative solutions for the problem. This research aims to analyze the most implementable strategy in the development of community participation in Pantai Bahagia Village, to encourage the community participation in managing mangrove forest ecosystems with AHP as the methods.

Analytical Hierarchy Process (AHP) one of the multiple decision-making methods that model decision-making processes mathematically and are used to solve complex problems [14]. For this reason, the AHP method is chosen to describe the existing problem as the main objective, using selection criteria that make an activity manageable and sustainable, namely: program effectiveness (duration), duration of the program (duration), costs to be incurred during implementation program (cost), and an estimate of whether the positive impact of the program will continue or only succeed for a short period of time (sustainability).

2 Methodology

This research uses the combination of the in-depth interview to generate the alternative strategies and for self-judgment using the Analytical Hierarchy Process (AHP) method. The in-depth interview is conducted on 30
productive adults (aged 17 - 60 years) living in Pantai Bahagia Village, including members of the Indonesian Mangrove Volunteer Community (KeMANGTEER), Save Muara Gembong (NGO) and Muara Beting Tourism Awareness Group (Pokdarwis), who actively participate in the management and rehabilitation of mangroves in the Pantai Bahagia Village. The in-depth interview is conducted during September to November 2018, during West Season. The population of the Pantai Bahagia villagers who have a high level of concern and participation in managing mangroves is interviewed to collect the internal and external factors, which encourage or discourage community participation and develop strategies to increase community participation in rehabilitating mangrove at Pantai Bahagia Village to formulate 5 (five) alternative strategies is conducted aimed to determine the most important factors that influence the development of pro-environmental behavior in the rural-urban community.

Next step is generating the AHP model, on which the selection criteria from the study are utilized to benchmark the offered alternative solutions. Finally, the scoring and grading are done with AHP Calculator Software, while maintaining the Consistency Ratio (CR%) under 10%. The obtained priority ranking helps to decide which solution is the best to achieve the study objective.

3 Result and Discussion

3.1. Formation of Alternative Strategies

The in-depth interview is meant to collect 24 internal and external issues faced by the adult population who are actively conserving the mangrove in Pantai Bahagia Village. The issues then are prioritized by scoring, and then 5 (five) main problems are generated based on the highest scores. The main problems are:

1. The lower income of the mangrove management community;
2. Only a few people involved in mangrove management;
3. Minimal recommendations and concern from the local government;
4. The permits and regulations are still not in line with the interests of the public, the private sector, and the government; and
5. Lower willingness and ability of the community to manage mangrove ecosystem.

Therefore, the alternative solutions are formulated by using the negation of the sentences. The alternative solutions proposed are categorized based on the socio-economics, socio-cultural, and stakeholder engagement, namely:

1. Develop the creative business as alternative income for the community (Socio-economic Alternative);
2. Involve more people from various backgrounds to commit in mangrove management, not only the fishermen community (Socio-cultural Alternative 1);
3. Engage more with the local government to get maximum recommendations and concerns (Stakeholder Engagement Alternative 1);
4. The permits and regulations comply with the interests of the public, the private sector, and the government (Stakeholder Engagement Alternative 2); and
5. Held training and workshop for the community to build their capacity in managing the mangrove ecosystem (Socio-cultural Alternative 2).

3.2. Decision of Most Implementable Alternative Strategy

The model of Analytical Hierarchy Process (AHP) method in determining the main objective, selection criteria, and alternative solutions for mangrove managing community in Pantai Bahagia Village area is presented in Figure 2. The main objective in this study becomes the aim of model, and the criteria and alternative solutions are generated based on literature studies. Next, each alternative will be benchmarked on priority, according to the selected criteria, thus, determining the decision that is manageable, and most important to be implemented in Muara Gembong District.
Figure 2. AHP model to determine the main objective, selection criteria, and alternative solutions.
The considerations for criteria selection is described in Table 1.

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness</td>
<td>The effectiveness of alternative actions is important for the implementation, post-implementation and evaluation of the programs.</td>
</tr>
<tr>
<td>Duration</td>
<td>The duration of alternative actions is important to estimate which program is able to be implemented the soonest.</td>
</tr>
<tr>
<td>Cost</td>
<td>The cost of alternative actions is important to estimate which program is most economical to be implemented.</td>
</tr>
<tr>
<td>Sustainability</td>
<td>The sustainability of the alternative actions is important to decide which program is sustainable, not only for cross-sectional purpose.</td>
</tr>
</tbody>
</table>

The calculation result of the priority of the criteria is presented in Table 1, where sustainability aspect of the alternative strategies becomes the first rank on priority of all 4 criteria (=0.487).

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Duration</th>
<th>Cost</th>
<th>Sustainability</th>
<th>PRIORITY</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3.00</td>
<td>0.50</td>
<td>0.331</td>
</tr>
<tr>
<td>0.14</td>
<td>1.00</td>
<td>0.50</td>
<td>0.12</td>
<td>0.056</td>
</tr>
<tr>
<td>0.33</td>
<td>2.00</td>
<td>1.00</td>
<td>0.33</td>
<td>0.126</td>
</tr>
<tr>
<td>Sustainability</td>
<td>2.00</td>
<td>8.00</td>
<td>3.00</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>0.487</strong></td>
</tr>
</tbody>
</table>

Based from the calculation, sequentially ranked criteria from the first to last priority are: sustainability, effectiveness, cost, and then duration. This ranking method is accepted due to as the purpose of the program is to ensure the program implementation is not only sustainable, but also effective and cost-friendly. The duration is not important as it is understandable that mangrove saplings need time to grow into its mature form. Thus, all of these activities are not beneficial if they are only done once (cross-sectional). Hence, if restoration of mangrove becomes habitual and conducted in daily activities, the result can be obtained in long term.

Table 3 – 6 presented the results of pairwise comparison result of each alternative activity explained in Figure 2, following the other of the criteria ranking. Table 3, 5, and 6 indicate that the pairwise comparison ranked the Alternative of Socio-economic as the first rank; while Table 4 shows that the Alternative of Socio-cultural is the first rank. Afterwards, each value grade on priority is calculated to get the value of total priority, thus, resulted in the ranking of alternative solutions as presented in Table 7, where Socio-economic alternative placed on the first rank with priority of 0.456 (45.6%).
| Table 3. Result of AHP Calculation on Priority Towards Sustainability (CR% = 3.3%) |
|-----------------|--------|--------|--------|--------|--------|----------|
|                | SE     | SC1    | SC2    | STEN1  | STEN2  | Priority |
| SE             | 1.00   | 6.00   | 1.00   | 8.00   | 9.00   | 0.438    |
| SC1            | 0.17   | 1.00   | 0.33   | 5.00   | 2.00   | 0.115    |
| SC2            | 1.00   | 3.00   | 1.00   | 9.00   | 7.00   | 0.357    |
| STEN1          | 0.12   | 0.20   | 0.11   | 1.00   | 0.50   | 0.035    |
| STEN2          | 0.11   | 0.50   | 0.14   | 2.00   | 1.00   | 0.055    |
| TOTAL          |        |        |        |        |        | 1.000    |

| Table 4. Result of AHP Calculation on Priority Towards Effectiveness (CR% = 3.4%) |
|-----------------|--------|--------|--------|--------|--------|----------|
|                | SE     | SC1    | SC2    | STEN1  | STEN2  | Priority |
| SE             | 1.00   | 0.33   | 3.00   | 6.00   | 8.00   | 0.290    |
| SC1            | 3.00   | 1.00   | 3.00   | 7.00   | 9.00   | 0.485    |
| SC2            | 0.33   | 0.33   | 1.00   | 2.00   | 4.00   | 0.127    |
| STEN1          | 0.17   | 0.14   | 0.50   | 1.00   | 2.00   | 0.061    |
| STEN2          | 0.12   | 0.11   | 0.25   | 0.50   | 1.00   | 0.037    |
| TOTAL          |        |        |        |        |        | 1.000    |

| Table 5. Result of AHP Calculation on Priority Towards Cost (CR% = 3.2%) |
|-----------------|--------|--------|--------|--------|--------|----------|
|                | SE     | SC1    | SC2    | STEN1  | STEN2  | Priority |
| SE             | 1.00   | 6.00   | 2.00   | 7.00   | 7.00   | 0.499    |
| SC1            | 0.17   | 1.00   | 0.50   | 3.00   | 1.00   | 0.104    |
| SC2            | 0.50   | 2.00   | 1.00   | 7.00   | 4.00   | 0.266    |
| STEN1          | 0.14   | 0.33   | 0.14   | 1.00   | 0.33   | 0.041    |
| STEN2          | 0.14   | 1.00   | 0.25   | 3.00   | 1.00   | 0.890    |
| TOTAL          |        |        |        |        |        | 1.000    |

| Table 6. Result of AHP Calculation on Priority Towards Duration (CR% = 3.4%) |
|-----------------|--------|--------|--------|--------|--------|----------|
|                | SE     | SC1    | SC2    | STEN1  | STEN2  | Priority |
| SE             | 1.00   | 8.00   | 4.00   | 7.00   | 9.00   | 0.597    |
| SC1            | 0.12   | 1.00   | 0.50   | 2.00   | 2.00   | 0.097    |
| SC2            | 0.25   | 2.00   | 1.00   | 5.00   | 3.00   | 0.190    |
| STEN1          | 0.14   | 0.50   | 0.20   | 1.00   | 0.50   | 0.049    |
| STEN2          | 0.11   | 0.50   | 0.33   | 2.00   | 1.00   | 0.067    |
| TOTAL          |        |        |        |        |        | 1.000    |

| Table 7. Result of AHP Calculation on Total Priority |
|---------------------------------|--------|---|
| Priority                       | Rank  |
| Socio-economic Alternative     | 0.456 | 1 |
| Socio-cultural Alternative 1   | 0.200 | 4 |
| Socio-cultural Alternative 2   | 0.235 | 3 |
| Stakeholder Engagement Alternative 1 | 0.047 | 5 |
| Stakeholder Engagement Alternative 2 | 0.262 | 2 |
4 Conclusions

Based on the AHP Analysis, it is determined that Alternative Socio-economical, the development of the creative business as alternative income for the community, is the chosen strategy as the most sustainable, effective, economical, and the fastest alternative strategy to develop community participation in the management of mangrove forest ecosystem in Pantai Bahagia Village, Muara Gembong District, West Java. It is recommended for all stakeholders to collaborate to formulate a business plan for the fishermen community, such as ecotourism, mangrove planting activity with third parties where the tourists pay for the young trees, art, and/or traditional culinary as side income from aquaculture business, so that the mangrove deforestation will be reduced.

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References


Effectiveness of Scientific Blended Learning-Product Oriented Against Student Competency Enhancement

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Abstract. This study aims to determine the effectiveness of using Scientific Blended Learning - Product Oriented (SBL-PO). The effectiveness of learning is measured by increasing the ability of soft skills and student learning outcomes from the aspects of knowledge and skills in the lecture process. This study uses a quasi-experimental method. Data collection techniques used observation sheets, questionnaires, and assessment sheets. Data analysis was performed with descriptive and quantitative statistics. Quantitative analysis was carried out by different tests of the Wilcoxon Signed Ranks Test and the Kruskal Wallis Test. The results of the study show that SBL-PO has proven effective in improving the ability of soft skills and student learning outcomes. This is evident from the student's soft skills ability to increase significantly (p = 0.000) at each meeting. Improved student learning outcomes also proved significantly (p = 0.014) better after using the SBL-PO learning model compared to before using the SBL-PO learning model.

Keywords: Scientific, blended learning, product oriented, ability of soft skills, student competency

1 Introduction

Higher education as a formal education institution aims to improve intelligence, knowledge, personality, noble character, and skills so that the graduates can live independently and practice the knowledge they have acquired. Therefore, universities as producers of human resources have a heavy responsibility in equipping graduates that they produce in entering the workforce. Global competition is currently very tight in all fields, so universities are very interested in maintaining the quality of their graduates as a necessity in maintaining their image and competitiveness in facing the world of work and industry.

Efforts made to improve the ability of students in higher education, especially for prospective teachers, are always organized and directed at various relevant learning goals such as: (1) learning to believe and devote to God Almighty, (2) learn to know (learning to know), (3) learning to do, (4) learning to live among each other side by side (learning together), and (5) learning to form identity (learning to be). Based on the goals and objectives of the study, the UNIMED Engineering Faculty graduates are expected to master the subject matter both theoretically and practically, which is certainly inseparable from the role of the lecturer who teaches in the classroom.
Development, capacity building, and student learning capacity have always been a concern for managers and lecturers in producing the quality of relevant graduates, so as to produce prospective professional educators with a nuanced nuance in the era of globalization with competency and Indonesian-ness who can win global competition. It should be understood that in the current technological era it is characterized by a shift in the mindset from the linear-mechanistic to the synthetic mindset (creative thinking), followed by the emergence of new cultural traits. Therefore, to realize a quality generation it is necessary to do proactive efforts by fixing the learning system in the Teacher Education Institution which will produce qualified teacher candidates who are able to demonstrate their capacity and capability to compete with prospective teachers from other countries.

Based on these conditions, it is imperative that efforts to change the orientation and learning objectives carried out by the Educational Institution whose paradigm is TCL (Teaching Centre Learning) lead to SBL (Student Based Learning), in order to produce qualified graduates of prospective teachers. SBL is an approach that uses more learning methods/strategies that place students as active/independent subjects/learners, with psychological conditions as adult learners, fully responsible for their learning, and able to learn beyond the classroom. With these principles, students are expected to possess and live the soul of a long-life learner and to master the hard skills and soft skills that support each other. Other conditions, the lecturers will switch functions to become facilitators, including as learning partners, and no longer as a primary knowledge source.

Along with the development of information technology, as well as the availability of supporting facilities, it is very necessary to have learning innovations that make it easier for students to use available e-learning facilities, so that student acquisition is more optimal [1]. Learning innovations that are considered very relevant are the application of blended learning that combines online learning with face-to-face learning, by controlling the acquisition of product-based lectures.[2][3] shows that the use of blended learning will provide benefits such as: (1) Optimizing the use of internet facilities in the overall learning process), (2) Optimizing the use of learning time for students, (3) Facilitating and expanding communication media between students with lecturers, and (4) Optimizing student learning achievement. Based on these conditions, it is very necessary to find ways to implement population-based blended learning that is effective in increasing students' ability to achieve the determined learning outcome.

[4] Describes blended learning as It represents an opportunity to integrate the innovative and technological advances offered by online learning and participation offered in the best of traditional learning. [5] States that blended learning is a learning model that combines face-to-face learning and online learning. Often with the development of scientific implementation in the learning process, it is very relevant if blended learning is combined with scientific learning, because scientific is able to direct students to dig up information through observation, asking questions, experimenting, then processing data or information, presenting data or information, followed by analyzing, reasoning, then concluding, and creating, so that it is also very relevant to produce products [6][7]. Product oriented learning makes learning centered on students, involving science process skills in constructing concepts, laws or principles, capable of involving potential cognitive processes in stimulating the development of the intellect, especially the high-level thinking skills of students.
2 Methodology

This research was initiated by Research and Development (R & D) research which aims to develop product-oriented blended learning models and devices. The research model was adapted from Thiagarajan, Semmel, and Semmel in Trianto (2013: 189), namely the development of Four-D Models. The Four-D model consists of 4 stages of development, namely: define, design, develop, and desseminate or adapted to a 4-P model, namely (1) Defining which includes the front end analysis, student analysis, task analysis, concept analysis, and the formulation of learning objectives. (2) Design (Design) which includes the preparation stage of the benchmark reference test, the stage of media selection, format selection. (3) Development includes device validation by experts followed by revisions, simulations, limited trials with real students. (4) Disseminate stage is the stage of the use of devices that have been developed on a wider scale. At this final stage, the quasi-experimental method is used to determine the effectiveness of the use of the model found.

Data collection techniques in this study used instruments in the form of questionnaires, interview guidelines and documentation on development activities, and used test instruments on model effectiveness testing activities. The data analysis technique used in this study is a different test and explained by simple qualitative descriptive analysis techniques.

3 Result and Discussion

The findings of the model used include the Lecture Planning Activity model, and the learning implementation model. The results of the needs analysis in the initial activities indicate that product-oriented blended learning requires comprehensive planning related to mechanisms, facility readiness, learning resources, and commitment between students and lecturers [8]. Thus in general the steps developed in planning product oriented blended learning activities as shown in Figure 1.
In developing learning both by applying Blended Learning and conventionally, lecturers need to develop appropriate learning steps in a learning implementation plan based on the basic competencies that are to be achieved in learning. The development of learning steps that apply Blended Learning also needs to be well designed, based on the steps outlined in the planning section so that in the implementation of learning students do not feel technically difficult. Therefore, lecturers need to prepare everything needed, such as the materials that will be delivered or discussed, the platform that will be used in learning with Blended Learning, platform use tutorials used in learning by applying Blended Learning and so on. Before implementing learning by applying Blended Learning, lecturers must prepare all their learning needs, especially the use of technology platforms that will be used in learning that will be used without carrying out face-to-face.

Several platforms that can be used in learning with Blended Learning in accordance with selected types of on-line media, such as Group Mailing Lists (Mailing Lists, such as Yahoo groups, Google+, and Google classroom), Web Blog Teachers, Social Media (Facebook, Twitter, Instagram, Path, etc.), Learning Management Systems or LMS Applications (such as Moodle, Edmodo, Quipper, Kelase, etc.) and so on. Next, how the platforms that have been determined by the lecturer are applied in learning beforehand in advance in the learning steps designed.

Based on the results of the needs analysis, and a description of the planning steps and types of lecture activities that allow it to be done online and face to face, then in the context of lectures by combining the application of six class assignments, the lecture activities can be described as shown in Figure 2.
The developed model equipped with standards or provisions relating to the use of models in each course. The terms of the use of the model, consisting of interrelationships with the Quality Standards of Planning, Learning, quality standards for the implementation of lectures, and standards of monitoring and evaluation.

The provisions relating to the Learning Planning Quality Standards consist of: (1) Lecturers planning blended learning which are prepared based on scientific learning principles compiled in the Lecture Program Unit, (2) Lecturers arrange teaching materials and socialize to students through lecturer blogs, (3) Lecturers are able to choose the most suitable learning method to achieve the desired outcome (product) of learning, (4) Learning resources are provided according to the learning objectives, and (5) Learning facilities and infrastructure can support learning. This condition will create a learning process that can be done by students and lecturers not limited by time and place [9]; [10].

Furthermore, the provisions governed by Learning Implementation Standards include: (1) Lecturers must be disciplined in carrying out learning, both online and classroom learning, (2) Students must be actively involved, both online and face-to-face, so that they are created interactions that support learning, (3) Lecturers must be exemplary pedagogically, personally, socially, and professionally in the face-to-face learning process applied must be able to develop learners as much as possible, (6) Learning facilities and infrastructure must be used optimally, (7) Learning methods must direct students to study independently or in groups, (8) Lecturers are able to develop and use various teaching media, (9) Learning resources can be accessed by interested parties, and (10) Administration of learning support activities carried out in a transparent and accountable manner [2].

While the standards regulated in Monitoring and Evaluation activities include: (1) Learning outcomes assessment is carried out transparently, (2) Evaluation of learning must be able to measure achievement of competence, conscience, and compasion, (3) Lecturers utilize feedback from students to improve the learning process, (4) Lecturers and students reflect on the learning process for continuous improvement, and (5) The learning process is evaluated in each face-to-face activity, (6) Every lecturer must develop and provide assignments consisting of routine assignments, critical book report, review journal, mini research, engineering ideas, and projects in order to evaluate learning outcomes and to improve students' learning abilities and experiences, (7) Each task is corrected, discussed and / or returned to students as feedback on the process and results of learning through selected media channels, and (8) the minimum
number of assignments given should be adjusted to the credit load and planned in the learning plan.

The use of product-oriented blended learning models, in addition to being expected to be able to improve students' soft skills, is also expected to improve student learning outcomes. Therefore, one indication of the effectiveness of the use of the model is the increase in student learning outcomes, in addition to the improvement of soft skills. To see an increase in student learning outcomes on the use of models in subjects that are the subject of research, learning outcomes data are needed on the application of models and data on student learning outcomes in the same subject and the same lecturer before using the model.

Student learning outcomes data obtained from the results of the application of the model is the average score of student learning outcomes on subjects that are the subject of research trials that take place in odd semester. While the data on student learning outcomes before the application of the model is the data on learning outcomes for the same subjects as the subject subjects, taken care of by the same teaching team, and took place in the previous year. The student learning outcomes data analyzed are the final values derived from the accumulation of formative values from one to the value of students obtained in formative four for each group of subjects. The average score of learning outcomes in both groups of subjects before and after the application of the model is summarized in Table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Courses code</th>
<th>Average Score Before Model Application</th>
<th>Average Score After Model Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1</td>
<td>81.79</td>
<td>88.95</td>
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<tr>
<td>2</td>
<td>A2</td>
<td>80.22</td>
<td>81.35</td>
</tr>
<tr>
<td>3</td>
<td>A3</td>
<td>81.19</td>
<td>82.65</td>
</tr>
<tr>
<td>4</td>
<td>B1</td>
<td>74.14</td>
<td>83.81</td>
</tr>
<tr>
<td>5</td>
<td>B2</td>
<td>77.08</td>
<td>81.99</td>
</tr>
<tr>
<td>6</td>
<td>B3</td>
<td>81.81</td>
<td>88.76</td>
</tr>
</tbody>
</table>

Based on the data, it can be seen that student learning outcomes in the B1 and B2 subject groups before using the blended learning model are relatively low (74.14) and (77.08), and after the application of the model the learning outcomes are much better. The B1 and B2 subject groups are courses that are in the first semester, so students who take this course really need guidance to adjust. The use of the blended learning model, at each meeting will be given orientation and reflection as part of the learning approach that serves to give direction to learning, so that students will be able to adjust in the face of lectures. Data comparison of learning outcomes B1 and B2 between before and after the application of the model shows that the application of the learning model greatly helps students to adjust quickly so they are able to obtain better learning outcomes.

To find out whether student learning outcomes in each group of subjects after the application of the learning model are better than before the implementation of the model, it is necessary to do the testing with different tests. The summary of the results of the different test after (µ1) and before (µ2) the application of the model is shown in Table 2.

The test results showed that all subjects that were the subjects of the study gave different student learning outcomes after the use of the model compared to before using the model. Based on the average data of learning outcomes shows that the average student learning outcomes after the use of the model is higher when compared with the average student
learning outcomes before the use of the model. Thus, student learning outcomes are better after the use of the model when compared to before using the model. This provides an indication that the use of blended models effectively improves student learning outcomes.

**Table 2. Summary of Different Test Results After (µ1) and Before (µ2) Application of the Model**

<table>
<thead>
<tr>
<th>No</th>
<th>Courses code</th>
<th>( \chi^2 ) count</th>
<th>( \chi^2 ) Table</th>
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<tr>
<td>6</td>
<td>B3</td>
<td>6,00</td>
<td>3,84</td>
<td>different</td>
</tr>
</tbody>
</table>

Furthermore, the observation activities on improving the ability of soft skills that are targeted at the research activities are carried out in three stages according to the implementation cycle of formative activities. Observation activities were carried out on six subjects that were targeted by the study. The recapitulation of the overall observations is shown in **Table 3**.

**Tabel 3. Recapitulation of Student Soft Skills Observation**

<table>
<thead>
<tr>
<th>No</th>
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<th>Mata Kuliah</th>
<th>Rata-rata</th>
</tr>
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<td>Pertemuan 5</td>
<td>A2</td>
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<td>2,13</td>
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<td>Pertemuan 15</td>
<td>B3</td>
<td>2,25</td>
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</tbody>
</table>

Based on the data in **Table 3**, it can be seen that the average ability of the students' soft skills observed has increased in each meeting. Increasing the ability of soft skills at each meeting reached an average of 9.28%. If the observation results are reviewed in each formative cycle, then the average increase in soft skills ability in the second cycle to the third cycle is 30.51% (from an average of 1.51 to 2.17), and in the third cycle to the fourth cycle reached 26.47% (from an average of 2.17 to 2.95). The increase in the score of soft skills ability also looks significant based on the results of the Kruskal-Wallis Test with Chi Square. Based on the results of the test with the help of the SPSS program, it shows that the Chi Square value is 71.42, while the Chi Square value of the table is 19.7. These results indicate that the value of itung2 count> \( \chi^2 \) tables, thus the average score of soft skills obtained by students at each meeting is significantly different.

Based on the profiles of the two groups of subjects in improving the ability of the students' 'soft skills, it was seen that each of the subjects in the two groups of subjects had similarities in improving the abilities of students' soft skills. The results of different test scores on the
average skills of soft skills produced from the two groups of subjects show that the value of the probability of acceptance (Asymp. Sig) is obtained at 0.97, and the acceptance value specified is 0.05. This means that the probability value is > 0.05, which means that the average score of the students' soft skills produced from the two groups of subjects does not have a significant difference. These results also prove that all subjects who are the subjects of research have similarities in developing the ability of students' soft skills, without having to distinguish between educational groups or study groups.

4 Conclusion

Based on the results of the study concluded that the results of the effectiveness test show that the scientific model of blended learning is product oriented, effectively improving student learning outcomes. Based on the analysis of student learning results indicate a significant increase between learning before using the model with after using the model. This result shows that the average student learning outcomes are better when compared to the average student learning outcomes before using the learning model. The results of observations on the ability of student soft skills also showed a significant increase, where the average increase of each meeting reached 9.28%. The improvement in the ability of soft skills for students does not differ between courses that are followed by students (See Table 3).

References

The Role of Group Sharing Model in Creating Effective and Fun Learning

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Abstract. Students expect an attractive and fun learning to motivate and to help them understand the lesson. Teachers, as the ones who manage a learning activity, have designed group sharing model that can promote an interesting and engaging learning. This paper explores the issue regarding the role of group sharing learning model in promoting a fun and effective learning. The purpose of the current study is to describe the role of the learning model in achieving its targets. It can be inferred that the group sharing learning model is able to have the students engaged in the activity because the model allows them to be creative in developing their competence. Furthermore, this effective learning integrates the concepts from each member of a group based on the focus of the lesson.

Keywords: Group Sharing, Learning, Effective, Fun.

1 Introduction

Many students [1];[2];[3] expect attractive, effective and fun learning by which such learning can help them to pay attention to the class. It also psychologically promote a comfortable situation for teachers in transferring the knowledge to their students. Therefore, the learning objectives can be achieved through implementation of learning model.

Learning model [4][5] refers to a learning method implemented by the teachers to create effective and attractive learning for students. It also helps the teachers to disseminate the knowledge to their students in understanding a particular lesson. The success of the implementation depends on the teachers’ competence in designing a learning model based on the proposed guideline.

Furthermore, a learning model aims at promoting engaging and effective learning to improve students’ academic achievement. They will be guided to develop their self-competence through their works in a real-time situation. This will alleviate their problems during the learning.

Teachers[6] are responsible for developing an effective and engaging learning which is expected by those who concern with the issue of education, e.g., students, parents, as well as the society. Parents play [7] a significant role in improving students’ academic achievement whereas the society is responsible for enhancing the students’ capacity. By that, teachers are expected to promote an attractive and effective learning atmosphere. The implementation of group sharing learning model is, therefore, expected by the learners in participating in effective and fun learning; the process is implemented without having the students feel being
forced to learn. Still, the situation enables the students to focus on the lesson to achieve the indicators of the learning.

2 Methodology

2.1 Group Sharing

Group Sharing[8][9] is a learning model that gives the students the freedom to improvise and to be creative in the process of learning. It also enables the students to produce something as a result of their learning; the result will be presented to other students in a group by visiting one booth (the groups will work in some booth) to another.

The term learning model refers to a systematic procedure in formulating a learning objective. This term shares some similarities with strategy, method, and learning approach. Recently, there has been a number of learning models developed that range from the simple to the complex one due to the instruments needed in its implementation. Therefore, a teacher is required to possess teaching competence to motivate his or her students, to design an instructional model, to manage the class, to communicate and plan the learning, and to conduct an effective evaluation [10].

Group sharing is a learning model which allows the students to develop their competence on their own through producing their works based on the designed materials. The implementation of this learning method aims at promoting an effective learning. Furthermore, Griffiths (2015) adds several characteristics of an effective learning, such as transformative, active, interactive, intrinsically motivating, and life-long.

According to Kızkapan et al (2017), project-based learning model is unable to enhance students’ academic achievement significantly. This is due to the fact that most students are adjusted with the traditional learning model in which the teacher is the center of the learning. As a result, such a teacher-centered approach constraints the implementation of group sharing model. Thomas (as cited in [11]) argues that curriculum is essential in implementing a learning model—it serves as the guideline of the model.

According to Janaikova and Janaik (2017), the development of natural science results in a condition by which the students will be more likely to discover a particular process. In other words, this is considered as demand for young students. They are expected to possess abstraction skill and the ability to comprehend a correlation between the model and the most frequent reality. Consequently, this will guide the students to recognize the reality.

An innovative learning creates another challenge in understanding the implementation of the technology development in a learning model. Without a clear concept regarding the complexity and the development of the role of technology, it is difficult to examine the advantages of the use of technology and media in the learning model to enhance the learning activity [12].

Therefore, the success of the implementation of group sharing model lies in the teachers’ effort to create an attractive and efficient learning situation as well as to reach the target proposed in the curriculum.

Group sharing is a learning model which involves a number of groups of students to discuss and create a work regarding the lesson in the form of a picture or description; the product from each group will be displayed on a post-it. There will be a representative of each group who is responsible for describing their work every time other groups visit their post-it. The way the representative explain the details will be assessed by the other.
This model[10]-[14] is able to engage all students throughout the learning because of the different jobs that have been distributed to all members of each group. As a result, students are aware of their job even though it is somewhat a simple task. Students will focus on the learning because they are required to achieve the target.

3 Result and Discussion

3.1 Defining Effective Learning

Effective learning refers to a process of teaching and learning that enable the learners to learn more specific skills, knowledge, and attitude. This kind of learning also creates an atmosphere by which the students enjoy the class.

Several components, e.g., developing one’s knowledge gradually, discovery-oriented knowledge rather than memory-oriented, questioning, community learning, modeling, reflection, and authentic assessment are involved in an effective learning [13].

According to Topala (2014), an effective learning refers to a situation of achieving high performance with the lowest cost. Topala further explains that a positive appeal during the learning process results in a situation to work, ensuring the involvement of an active individual in learning. This effective learner’s responsibilities are to form information, policy, and ideas from his or her teacher through an effective use of learning resources [14].

The tenet of effective learning is to reach targets of the learning process rather than to produce something related to the skills that the students should master after the learning activity [9].

3.2 Defining Fun Learning

Fun learning is among things that students expect in the class. Therefore, it is the main duty of a teacher to design learning that could motivate the students to be creative and active as it can eliminate boredom during the learning. This is in line with Zinn’s argument that developing students’ capacity to think creatively and critically through fun but serious learning [9].

Designing a fun learning is not that difficult for teachers since they can utilize some media to support them in their practice. The rapid pace of technology development will help them during the implementation of a particular learning model in motivating the students. According to Saeedeh, Michele, Mo and Nina (2015), a project-based learning model that integrates some aspects of designing, science, and technology is effective to raise students’ enthusiasm and participation.

Fun learning contributes to the students’ learning outcome. According to Packer and Ballantyne (as cited [8]), both the aspect of fun and entertainment is related to an idea that an enjoyable situation is a key to a successful learning based on the students’ perspective. Therefore, the group sharing model offers a learning that can create such a condition in promoting students’ curiosity regarding a particular lesson. Boddy, Watson and Aubusson (2003) add that motivation can lead the students to learn and vice versa. Motivation and learning are interdependent; both are supporting each other.

Fun learning also creates an attractive learning situation that can eliminate boredom and enable the students to focus on the lesson [14]. In other words, a fun learning refers to a process of learning that can motivate the students and improve their concentration during the class.
Mildner, Beck, Reinsch and Effelsberg (2016) argue that the key aspect of this learning is to integrate games into the activity which results in an enjoyable and effective learning. Such a game can be regarded as the part of the learning process; it is inseparable from the learning. Moreover, one may change the game used in a specific lesson.

4 Conclusion

The results reveal that the implementation of group sharing model is able to create an effective and fun learning compared to other learning models. This is based on the students’ engagement and participation during the class. Furthermore, teachers’ competence is the contributing factor of the success of the implementation of group sharing model. Teachers are required to master the model as well as to comprehend the students’ characteristics; this is to motivate and guide the students. An effective learning is a condition to accomplish targets in a set of time frame regardless of the efforts that have been attempted. On the other hand, fun learning refers to an enjoyable learning situation for the students that can eliminate their boredom during the class. This raises their motivation and curiosity to learn.

References


The Development of Mathematic Instructional Administration to Improve Problem Solving Ability

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Abstract. This study aimed to (1) produce a learning tools of Mathematics developed in the application of Contextual Teaching and Learning (CTL), (2) determine the effectiveness of learning tools of Mathematics developed in the application of Contextual Teaching and Learning (CTL), (3) determine the improvement of students' problem-solving skills with Mathematics learning tools developed in the application of Contextual Teaching and Learning (CTL). The subjects of this study were students of grade VII-1 of Junior High School (SMP N 2) of Gebang totaling 26 people. This research was an R & D study with a Dick & Carey development model. The results of this study indicated that (1) Mathematics learning tools developed in the application of Contextual Teaching and Learning (CTL) were effectively used, (2) the improvement of students' problem-solving skills with the learning tools developed.

Keywords: Learning tools, Contextual Teaching and Learning (CTL), problem solving skills

1 Introduction

The problem that often arises in the world of education was the weak ability of students to use their thinking skills to solve problems. Students tended to be presented with various information that demand memorization only. There was a lot of knowledge and information that students have but it was difficult to connect with the situation they face. Instead of being able to solve a problem, their knowledge was not relevant to what they are facing.

Based on the PISA (Program for International Student Assessment) study, in 2000, Indonesia was only able to occupy position 39 of 41 countries in the Mathematics field with a score of 367. In 2003, Indonesia was ranked 38 out of 40 countries with a score of 361. In PISA 2006, Indonesia ranks at 50th out of 57 countries with a score of 391. In the implementation of PISA 2009, Indonesia won 61st position out of 65 countries with a score of 371. While in PISA 2012, Indonesia was only able to reach 64th position out of 65 countries with a score of 375 [1]. Based on the data above, it can be concluded that the quality of education in Indonesia was still very low.

Mathematics learning should begin with the introduction of problems that were appropriate to the situation. In fact, the management of Mathematics learning in schools has not yet referred to the objectives of the Mathematics subject set in the Content Standard. This situation that might cause achievement or achievement in learning Mathematics for Indonesian students does not improve. This condition was increasingly apparent when looking at international assessments of Indonesian students' mathematics learning achievements.
Learning was no longer a "transfer of knowledge", but develops students' potential consciously through more dynamic and applicable abilities.

Education as a tool to make people useful for themselves and the social environment required a meaningful learning process. Meaningful learning required the activities of students to be active during the learning process. Student activities that were active in the learning process can be influenced by several factors. One of the factors that can influence it is the learning tool prepared by the teacher as a tool to support the achievement of meaningful learning.

Learning devices were certainly very needed in supporting the occurrence of the learning process. Learning devices were a set of tools that can help the learning process take place. Learning tools needed in managing the teaching and learning process can be: syllabus, Learning Implementation Plan (RPP), Student Activity Sheet (LKS) and modules.

In the process of preparing learning devices, a learning model was needed. Not all suitable learning models were applied in accordance with the environmental needs of students. For that, as a teacher must be able to understand the closest environmental conditions of students so that they can produce good learning devices. This can be done by applying the Contextual Teaching and Learning (CTL) learning model.

Contextual Teaching and Learning (CTL) was one of learning models that links the closest environmental conditions of students to the learning process. CTL made students able to relate the contents of academic subjects to the context of their daily lives to find meaning [2]. CTL was the connection of every material or topic of learning with real life [3]. CTL learning can be dealt with through the development of learning tools by applying the CTL model in it, both through learning resources, learning media and so on.

The CTL approach in learning Mathematics was chosen with the intention of efforts to improve the quality of learning. The CTL approach not only creates a comfortable and pleasant learning atmosphere but also meaningfulness. One of the media or learning resources that can be chosen in the CTL approach to learning Mathematics was the Student Worksheet (LKS). Trianto (2010) [4] suggested that LKS contained sheets containing a number of information or guidelines aimed at directing students to behave as expected by the teacher. Basically, LKS was very appropriate to be used to make students work independently. LKS was used as a step for students to carry out investigation or problem-solving activities. Information in LKS can be used as an exercise for students to develop aspects that must be possessed in the learning process.

Based on observations in grade VII -3 of Junior High School (SMP N 2) of Gebang Even Semester 2017-2018 Academic Year showed that out of 30 students only 13.3% of students actively listened to the teachers' explanation and did questions and answers in class, while 86.6% of students were seen just sit quietly without a learning response. The rest of the activities carried out by students were only playing in class, telling stories with friends, and scribbling books. Of the five items of Mathematical story form in the form of a test essay in solving problems about integers given, only 10% of the number of students were able to answer the question with the correct answers and completion steps while the other 90% answered the question with the wrong answers and resolution steps. Observation of students' responses to Mathematics learning showed that of the 30 students only 20% of students like Mathematics learning the rest 80% of students do not like Mathematics learning.

Mathematics learning in schools should emphasize the involvement of students who were active, and develop the view that Mathematics as a science was not just a calculation involving symbols and numbers. Rather, it was more about the application of mathematical concepts that exist in real life that are encountered everyday. So that abstract mathematical
concepts can be understood by students and applied in solving problems in their daily lives. Mathematics learning that wanted to be linked in the daily lives of students, should be adapted to the environmental conditions of students. This was to suit the needs of students. One of them was through the development of learning tools tailored to the conditions of the environment and the needs of students. Based on the description above, it was needed to conduct research on the development of CTL-based mathematical learning tools to improve students' problem-solving abilities.

1.1. Mathematics Learning Tool

Learning tools were a set of learning resources used by teachers and students to support the learning process. Learning devices were all learning resources, media and facilities used in the learning process [5]. In the learning process, the learning device consisted of various components used by the teacher. In this study, the learning tools in question were Student Worksheets (LKS), and Problem-Solving Ability Tests.

Student worksheets (LKS) were usually in the form of instructions and steps to complete a task in each subject matter [6]. Whereas [7] explained that the sheets were used to direct in the form of teaching with certain subjects in helping students improve reasoning process skills. LKS must be made by the teacher concerned so that the learning activities are adapted to the situation and conditions of learning, so that the existence of LKS allows students to maximize understanding in an effort to form basic abilities according to the indicators of achievement achieved.

1.2. Learning Contextual Teaching and Learning (CTL)

According to Sanjaya (2011) [8], CTL was a learning model that emphasizes student activity in full, both physically and mentally. Contextual learning was a concept of learning that helped the teacher connect between the subject matter he teaches and the real-world situation of students and encourages students to make connections between the knowledge they have and their application in daily life. The advantages of CTL learning were (1) learning becomes more meaningful and real, (2) learning was more productive and able to foster the strengthening of concepts to students, while the weakness of the CTL learning approach was that teachers were more intensive in guiding.

1.3. Mathematical Problem-Solving Ability

Problem solving ability was an ability that must be possessed by students in learning Mathematics. The problem-solving ability was considered to be the goal in the Mathematics learning process that students must have in learning Mathematics, because basically the problem solving ability was able to develop children's thinking skills in dealing with the problems they encounter in their daily lives.

Problem solving was a unity in Mathematics learning that cannot be separated from the Mathematics programs. In learning Mathematics required students to have problem solving skills. Not only must, but problem solving skills were indeed needed in the Mathematics learning process [9]. Learning Mathematics was a subject that teaches to think about getting things done. Problem solving skills required someone to find out the problem to be solved. According to [10] problem solving was "the process of accepting problems as a challenge to solve the problem while according to [11] Dahar (2011) problem solving was a human activity that combined concepts and rules that have been obtained previously, and not as a generic skill. Dewey describes the process that can be carried out as steps in solving problems,
namely: (1) understanding the problem, (2) planning the solution, (3) implementing the plan, (4) examining the process and results [12].

2 Methodology

This type of research was R & D development research. This research produced a product that was used in the school. This research was conducted at Junior High School (SMP N 2) of Gebang. The study was conducted in the odd semester of the 2017/2018 academic year on comparison material. The subjects of this study were grade VII students of SMP N 2 Gebang while the objects in this study were Mathematics learning tools in the application of the developed CTL. The development model used in this study was a model of Dick & Carey. The steps to develop the modification of the Dick and Carey model were; (1) identification of learning objectives, (2) learning analysis, (3) analysis of learning and context, (4) determining learning objectives, (5) developing and selecting learning materials, (6) developing learning strategies, (7) developing and choosing learning materials, (8) designing and conducting formative evaluations, (9) making revisions, (10) summative evaluation.

![Fig. 1. Modification model of Dick and Carey.](image)

The purpose of this study was to find out; (1) the effectiveness of Mathematics learning tools developed in the application of Contextual Teaching and Learning (CTL), (2) enhancing students' problem-solving skills with the learning tools developed. The instrument of this research was; (1) learning tool validation sheet consisting of LKS validation sheet, (2) problem solving ability test (3) student response sheet. The analysis of this research data on the expert validation questionnaire sheet uses descriptive quantitative, namely calculating the average percentage of indicators while the assessment data analysis tests the problem-solving ability using classical learning completeness and response sheet data analysis students use the Likert scale which was converted to an average percentage.

3 Result and Discussion

The development of Mathematics learning tools developed in the application of Contextual Teaching and Learning (CTL) referred to the 10-stage Dick and Carey development model. LKS that has been developed has been validated by the Mathematics material validators, linguist validators, and learning design expert validators. The results of expert validation showed that the Mathematics learning tools in the implementation of
Contextual Teaching and Learning (CTL) got a percentage score of Mathematics learning material by 86%, language at 85%, and learning design by 96% with very valid and feasible criteria.

The results of the problem-solving ability test showed that the pretest data obtained an average value of 57.32 with the percentage of classical learning completeness only reached 11% while the posttest data obtained an average value of 80 with the percentage of learning completeness in the classical reaching 88%. Based on the data above showed that overall students have achieved specified competencies and there was an increase in problem solving abilities after learning was done by using these learning tools. The results of student responses indicate that the responses of students obtain an average percentage in the first trial of 85% while in the second trial it was 89.1%. Based on data from trial results I and II ≥ 80% it was concluded that the learning device developed was effective.

4 Conclusion

Based on the results of the study showed that the Mathematics learning tools developed in the application of Contextual Teaching and Learning (CTL) was effectively used and there was an increase in students' problem-solving skills with the learning tools developed.

References

Creative Thinking in Fashion Deconstruction

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Abstract. Creative industri one of it is fashion is a backbone filled with steadily ideas creation requiring and competetitive dinamic innovation offering. Fashion is built through fashion design creative process to initiate bright idea will be accepted by market. The essence of fashion design is creativity. Creativity, Artistic as well as Innovation aim at how originally an object is built conceptually or through design. Creativity implies world new introductory but not for performing an existing design. Fashion design is claimed to represent new elements or genuin solution for problems for globalized competetive. The presence of de construcism is a contemporary culture which stipulates novelty and contemporary. Deconstrucism is a fashion style which displays strong fashion character which contains statement and high originality. Deconstructivism represents different attitude in work, represents fashion which has strong concept and character as a differentiator of other fashion that displays revolutionary fashion as every work has colementnfrontative collection. Through library research, ideas exploration and fashion design creation find creative construction to gain essential aspect in the creative process to prepare visual which contains ‘novelty’ in it. The Aspect and chategory discussed are manners that is prosecuted in fashion work deconstrucism.

Keywords: Creative, fashion, design, deconstructivism

1 Introduction

Creativity in the fashion design is crucially needed especially in creating artistical product that has market value. [15]. However, the problem of creativity is still a main issue and a central issue in developing creative industry in Indonesia [3]. This issue is derived from trade industry as a significant problem in gaining competition of artistic product relates to quality human resource among countries [16].

Creativity, culture and education is pictured as a future capital [2]. The creative industry capability in encountering the crisis based on the creativity globality and innovation making product design by noticing opportunities [17]. As having done by China, Globalization is anticipated by emphasizing on creative economic basic by preparing strategies such as massive improvement on national fashion industry concept [17]. Creative design, innovation and technology are the backbones which is described as two wheels that intensely support the future transition on fashion design sector as a creative fashion design scope which should be advanced positioned [8].

Fashion design lies on basic principles and pratices to make creative process logically by preparing frame work to improve the skills. One of the stages in fashion design is pointing out the creative design process which successfully applied to fullfill the market needs by considering trends and possesing problem solving [10]. These are need to support the students
to develop the innovation and experiments which will be a portrait of indicators which influence the fashion activity development in fashion learning to be adapted in the contemporary fashion industry [13]. The strength of character offered in the contemporary design is the novelty factor and deconstructivism problematic assumed as solution for creativity problems in fashion design learning.

Deconstruction is an architecture concept adopted into fashion idea which has contemporary aesthetic, unique and has strong concept during its process. Deconstruction is one of the most important phenomenon in the world of fashion. Designers were forced to look back, consider and discover the visual elements used [19].

Deconstruction is usually described as one of trends which changes rapidly in one mode. The discussion of architectural philosophy theory which is seen from alternative perspective theory - Michel de Certeau and John Fiske’s conception. This theory is used to glance at deconstructions and its important aspect in contemporary fashion design.

Challenging in deconstruct design has an essence of beauty naturally and emphasizes on the accuracy of stereotypical popular structure. Disordered method is quickly recognized by society and draws interest fashion practitioners attention and welcomed by acceptance through some arising critics. Deconstruvitation replication is getting new design from its original form to release from modernism standard as it was stilted, clean and simple. Contrasting from those, deconstructivism offers new design tends to be spoiling, incomplete, overlapped, separated from all and not integrated in a unity in which design elements apply edge pieces, repetition and translucent effect in the creative process [18].

2 Methodology

2.1. Creativity Problems in Fashion Design

Working in Fashion needs high creativity, time racing, competitive competitiveness to be a trendsetter [7]. Creativity and innovation which uphold originality is not negotiable, as working in fashion industry is susceptible in plagiarism carried out in a large scale. Before imitation is widen, fashion designer must send forth new design to offset the economic loss. Bringing up creation to be up to date is a must for a fashion design [5]. It requires the fashion creator to improve better innovation thru creative thinking. It is time for education to reform the learning methode by encouraging the students to ask from 'know – why' and finally become 'know – how'. The roots of creative society is basic education by leaving out old thinking not as a technician but as a visioner by using creativity, culture and education.

The characteristics of creativity always involve thinking or behaving imaginatively. Second, overall this imaginative activity is purposeful: that is, it is directed to achieving an objective. Third, these processes must generate something original. Fourth, the outcome must be of value in relation to the objective.

Creative idea could come up by appearing problematic found in the daily life in the context of social, politics and culture. The next stage is seeking on some facts or reality related to inovative and creative ideas. The accuracy of thinking power and focusing on issue which is raised to find its solution is challenging for students in finishing up an issue. The final result is a perfect concept and brilliant idea [12]. Essentially, learners are invited to be able to explore not only the ideas but also to find character in each design quality.

Stressing on the objective in fashion design facilitated by characteristics of fine arts elements of fashion deconstructivism, it is a learning substantive for creativity research and
appropriated innovation by integrating effective activity of learning. The application of deconstructivism characters could be standards of design understood by learners carried out thru informative research from central issues resource in making practical concept.

The importance of integration either theory or practical concept of deconstructivism in fashion design learning theoretically should be taught as a productive learning. The use of deconstructivism motivates students to actively participate with theoretical ideas from textual resources and apply these concepts in fashion designing concept [4]. The use of deconstructivism aims on how to motivate students to be innovative and creative designer [11].

2.2. Process of Creative Fashion

Like other theory of art and design, fashion has close relationship with theory and scientific method which involves creative design process in creating shelf reflection pattern of cultural practice. Theory of perception and reflection are parts of creative process and design format, universally visual, refer to observed cases. Though during its creative process ideas finding and thought are made on contingency context, but these do not mean creative process has no method. Complicated value concept in art or fashion are not transferred from objects of self contemplation performer, in fact it is negotiated or mediated by communicative ways [11].

Communication is not manifested in one way but is based on mutual interactions among designers, objects and performers. Fashion (like art) combine creative technique and innovative process as well as social exchange potential. It is served as a internal point of view, developing reflection from original practices of the creator (artist, designer) – as well as an external point of view, as a social role, aesthetic or culture [1].

Creativity problematic is discovered in the routines as in example, an attempt to immitate something, the result could be a like. It would be very different if someone does a diversity by doing variation and combination which finally lead someone to create an object which is call ‘novelty’ [14]. Evaluation on creativity is made based on value substancy derived from accurate analisys in giving response thru visual communication on ‘feel/sense’ of the creativity object. Artistic creative design or innovation, aims at created objects based on originality, conceptually and designs. Being creative means to familiarize the word new objects, on the other hand but showing off the emanated design. New elements or genuine solution are requested. The main factor of innovation is how a creative process influence genetically innate, environment, where someone revolt, it trigger a scientific revolutionary upheaval. Human creativity is generated by using dicotomy between rational such as left brain knowledge as intuitive and imaginative are on the right brain, which both need requiring combination to execute the innovation.

3 Result and Discussion

3.1. Deconstrucism on Fashion

Deconstrucism is a philosophical dialectic emerges at design study. This concept arises in the fine art periodically stages. Modernism is an answer of questions inquired by fine artists and practitioners of Art and Design problematics. Refusal of modernism is based on rigid visual form, clean, novelty concept acceptance and up todate known as contemporary.
Unusual pattern and confrontative on a deconstrucvism fashion design is an issue which has novelty value in the study of contemporary aesthetic.

One of the concept of deconstructism in the process context is ‘breaking’ by producing a ‘cut-off’ look or application of pointed hemlines, folding stocks, are unusual stiches, unfinished material expose which then is revalued as considered consumer products. Fashion design brings provocation and excitement, fear and homesickness. Deconstructivism makes problematic dualism between anesthesia and emotional innovation.

Deconstructivism allocates emotion attaches on fashion traditional system, load breaking relationship and traditional statistics. Isolating constructive element by deconstructing shape and fuctions into individual components. Overall, it is an approach to structural destruction. Conventional visual is a pile of different material, space and construction harmonically come up as collages or mess or disorder. Deconstructivism fashion design work dismantles standard aesthetics and observers are puzzled and enjoying on how the turmoil is rearranged coincidentally.

On the other side concept of deconstructivism design apply recycled products which stresses on aesthetic elements rather than ecologically consideration. Sewing technique could apply creation become pattern technic.

In the field of fashion design study, the deconstructivism approach is believed to bring changes to creative and innovative ways of thinking, especially in processing visual elements that lead to the creation of creative scissors techniques (Creative Cutting Technic) in addition to varied styling [1].

Deconstructivism Design has a contemporary aesthetic that emphasizes design work that is subjective in nature. In fashion studies this can help students to create new, imaginative elements that have implications for creativity and innovation. The demand for fashion design education in general is that each fashion learner is able to bring personal character to the design concept so that it has what is called the signature style.

3.2. Deconstructivism problems

Derrida’s Deconstruction Application as a method of creation has its own consequences. As explained earlier, to avoid a single meaning, deconstruction provides an appreciation of diversity, exploration of unregulated ideas and techniques so that elements of novelty are easy to obtain. But the consequence is that the communication aspect becomes less achievable because communication requires the same interpretation of meaning so that the message is easily understood [9].

As a solution, Derrida’s deconstruction is done partially so that the elements of novelty and communicative aspects can be achieved at once [6]. If then there is an assumption that the application of deconstruction will definitely produce anti-esthetic work, in fact it is a difference in understanding the definition of aesthetics. The aesthetic philosophy of each era and culture is certainly different. What is modernized as beauty by modernists is in fact contrary to postmodernists.

In the design of art and architecture, structure and form are subject to ‘destruction’ and new construction in the sense of deconstruction, reconstruction and transformation. In this case the user is no longer oriented to functions that emphasize clothing construction. The user’s vision of construction has shifted and made this understanding an important part. Traditional understanding. The deconstruction approach to fashion makes all these important and interesting things more visible, where shapes become more important than color. Acceptance of aesthetic concepts related to body proportions and criteria of beauty has shifted by questioning again.
3.3. Creative and Innovative in Deconstructivism

The goal of fashionable creativity in the alteration of the human body as a form of awareness of visual illusions towards human figures. The only main factor for fashion design is by using the shape of the human body as a reference to produce the best, "super superative forms also rise to superlative attention" [11]. This expression is a reality that designers commonly do for centuries in and the appearance of fashionable clothing is considered mandatory. Until now the adaptation of fashion creation with this tradition is still inherent, fashion is created to achieve the goal of perfection. Awareness of this perfection traditionally does not allow conflicting forms to become part of fashion. The design orientation is usually to correct less than perfect proportions. This is called Body Conciousness.

Deconstruction is a process that requires solving tradition, which is a rethinking of old ideas and reconfiguring of the old form. Deconstructivism questions the part of clothing that is considered fixed (fixed) but still needs to be questioned in other words 'not finished'. Traditional understanding of dress aesthetics is understood to be able to be observed through the completion of clothing that must meet the standard criteria set, such as the form of clothing that reflects body conciousness, proper finishing, to the completion of clothing details such as neat stitch edge accuracy. If there are unfinished finishes, silhouettes that do not refer to what is called an ideal body image, this condition for traditional understanding is considered a threat to dressing aesthetics. On the contrary for the understanding of deconstructivism, this is considered as deconstructing the aesthetics of the perfection of dress.

Traditional system design puts a combination such as a pattern or material that is assembled and draped on the body having a combination that is in line with the demands of ideal perfection of body shape. This principle is different in the design of Deconstructivism, which actually emphasizes the opposite. Form assembly and use of used materials is unusual. The forms used tend to use disproportionate or even excessive sizes. The main goal is to express the personal character of the designer about problems with themes from the environment, social, cultural, ultimately creating provocation in visualization representations. In the end this design has a personal, original character. The concept of thinking has been triggered by Avant-Garde thinkers who argue that through the creative process and work, it will produce a new dictionary of designs that are expected to able to challenge existing norms and attitudes aimed at creating a new visual language of clothing that is able to express a designable personality. It is anti-rationalistic and implies an intuitive world view; it aims at individual solutions that are specific to every object; uniqueness instead of mass production; organic forms; toleration of neglect and wear; corrosion and contamination used to intensify the expression; ambiguity and contradiction; suitability being less important. Beauty can be enticed out of ugliness [17].

3.4. Form - Overform - Deform -Multiform

Form is a concept of fashion construction made with a traditional system with awareness of Body Conciousness for the achievement of perfection. This concept overform tends to use a form that has a disproportionate size. Adding more size is extended from the normal shape, the initial shape is shifted so as to create the illusion of an abnormal shape. For example, the addition of certain parts that visually impress 'defect', due to the addition of shoulder pads. Or excessive attitude in exploring body shape. In this case the designer does not question the function of clothing in general. The function here is considered complete. Clothing structure is not disturbed by functional considerations, Clothing in this context is overformed by blurring the function of clothing to the point of immobility.
Deformation. The boundary between overforming and deformation is always changing. This concept rearranges the normal body shape so that it transmits the form not only at the level of overforming but has deformed the body, thus changing the overall figure of the human body. To strengthen this concept, it is supported by the use of textiles that are deformed in the form of 'so that it creates a deconstruction of the human body. The breakthrough about the concept of the body itself is carried out with a cubism approach by resembling it and using it again in a different way for character textiles. At this stage the body shape becomes fictitious, Kawakubo responds between an ideal and unrealistic figure leading to body fiction.

Fiction is mainly seen as elemental and postmodernist pretensions. Some deconstructivist designers process the concept of overforming more, but present poetically. As Kawakukbo's work questions the acceptance of imperfection, and the direction to traditional thinking about fashion, he repeatedly rejects the beautiful, noble and perfect concept by continuing to experiment with forms by creating two body silhouettes, bringing fashion designs closer to sculpture.

3.5. Multiform
The concept of deconstruction design is a process that develops from the previous process of deformation. A designer's intelligence with a combination of genius and the idea of creating a fashion form that is far from the formal law of clothing that produces imaginative forms such as the Organic form.

3.6. Organic Form
Formal law of clothing follows classical aesthetics and postulates of balanced proportions far exceeding organic forms and morphology. Morphological structure is considered as irregularity, or even as a provocation of this concept of clothing by departing from the previous concept. The creation of fashion can achieve a hyperstructured form of clothing itself. In these creations, the 'development' process appears to visually use overlapping lines, use of cross-linked materials or loss of stitches in knit patterns that cause open loops to appear holes so that organic patterns are created, resulting in forms innovative. The designer in this case does not aim to give decoration or has intentional elements to decorate.

Fig. 1. The work of student’s Deconstruction, reconstruction the normal arm into detail body shape
3.7. Fixation.

The other form of design in deconstructivism is still a reinterpretation of the initial function which was previously used by time. This shift in the function of clothing is a critical form of thinking in criticizing the function of clothing if it carries a central issue.

Innovation in fashion is by breaking down understanding, thinking logic that is free of doubts to bring up unusual ideas. Fashion design generally moves in recycling circles. The meaning is that fashion is currently in the formal law of repeating what happened in the past to be presented at this time with a few changes made to it. Simply put, a little innovation is done on it. But in the design of deconstruction, innovation is expected to emerge by presenting technology in fashion. Reflection on innovation at several levels in the fashion system: is at the level of style, idealism and conceptual in production, technology and materials.

Fig. 2. The work of students creative concepts of Deconstruction, development to garment structure detail expose material.

The attitude of innovation can take two possible routes, the first is creative destruction in the sense of stagnation in old ideas in one's mind, trying to forget what is already there, by breaking the rules. While the second is creating spaces; or create newness of continuity. Attitude Creativity and innovation in the design of deconstructivism fashion are required to be possessed by learners as part of the future designer profession.

4 Conclusion

The fashion design approach by applying deconstructivism aesthetics is expected to increase activity and have more competitive substance values. In addition to demanding that learners understand design techniques that emphasize structural analysis, aesthetics that involve visual elements and more broadly can hone students' insight into fashion related to current issues, topic trends, both socio-political and cultural. In this case the learner must collect this information, interpret it by describing it in a concrete manner, analyzing every information, then interpreting it to do a combination of information to find a unified concept that will eventually lead to fashion work that is able to reflect personal character. In this case the learner is required to find information about his 'self' and the information obtained in relation to the 'global' environment.
The search process by processing information obtained by investigating sources and conducting research and then conducting experiments. Deconstruction of clothing is to rebuild clothes by giving them a new aesthetic meaning. Construction is understood as a 'perfect' language setting. However, in the contemporary philosophy of deconstructivism, this is considered as a rejection of established aesthetics, so it needs to be reconstructed to find new aesthetic meanings through form studies.

The demands of creativity that are parallel to innovation are carried out on the awareness and desire for the need for the creation of new things. It is hoped that it can be used as an additive element as "opium" to continue to work in the creation of new things, so that each learner can display his best style. The ultimate goal of fashion creation is how fashion will deal with social and ecological consequences.

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Analysis of the Difficulties of Vocational High School Teachers in Mechanical Engineering Program in Implementing 2013 Curriculum in Medan City

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Abstract. This study aims to: (1) describe the level of difficulty of the teacher in planning, implementing and evaluating mechanical engineering learning; and (2) knowing what dimensions are most difficult for teachers in mechanical engineering learning. This research is a descriptive study with a quantitative approach. The population of this study were all mechanical engineering SMK teachers in the city of Medan, amounting to 36 people. Data collection techniques used are questionnaires. The data analysis technique used is statistical-descriptive analysis. Based on the results of the study showed that: (1) The level of difficulty of the teacher in the main task and function of the teacher generally included in the category of not difficult that is equal to 80.55%. However, there are still some teachers in the very difficult category, which is 5.56%. (2) The teacher in carrying out the stages of planning, implementing and assessing authentic learning falls into the category of not difficult. (3) The dimension that is most difficult for teachers in learning is the authentic assessment dimension; and (4) male teachers and non-government employees have more difficulty in carrying out authentic planning and assessment stages in the 2013 Curriculum.

Keywords: Teacher difficulty, mechanical engineering, 2013 curriculum

1 Introduction

The 1945 Constitution mandates that the establishment of the Government of the Republic of Indonesia, among others, to educate the life of the nation [1]. The government endeavors and organizes a national education system, which increases faith and piety as well as noble character in the framework of educating the life of the nation, which is regulated by the constitution. Furthermore, the Law on the National Education System states: The curriculum is a set of plans and arrangements regarding the objectives, content, and learning materials and the methods used as guidelines for the implementation of learning to achieve certain educational goals [2]. In its operation the curriculum is always changing in accordance with the times, at first the curriculum that applies is the 1947 curriculum until the last is the 2013 curriculum [3]. Development of the 2013 Curriculum is a further step in the development of a competency-based curriculum that was pioneered in 2004 and 2006 KTSP which includes attitudes, knowledge, and skills competencies into curriculums that in the implementation of the learning process, the approach/method recommended is to use the scientific approach/method, followed with learning models: problem based, project-based learning.
The development of the 2013 Curriculum is an advanced step in the development of a competency-based curriculum that was initiated in 2004 and the 2006 KTSP which includes integrated competencies in attitudes, knowledge and skills. In the 2013 curriculum according to the Minister of Education and Culture Regulation No. 65 of 2013 concerning Process Standards states that in the implementation of the learning process, the recommended approach/method is to use the scientific approach/method, followed by a learning model: problem-based, project-based learning, inquiry, and discovery of all subjects [4].

Implementation of the 2013 Curriculum which is based on character and competence has problems for teachers in involving all components in the learning process, starting from making Learning Implementation Plans, implementing learning using a scientific approach, assessment methods, empowering facilities and infrastructure and the work ethic of all citizens and the school environment [5].

Based on the description above, the objectives to be achieved in this study are as follows: to describe the level of difficulty of the teacher in planning, implementing and authentic assessment based on the 2013 Curriculum of Mechanical Engineering Vocational School in Medan City; and to find out which dimension is between planning, implementing, and authentic assessments that are most difficult for teachers based on the 2013 Mechanical Engineering SMK Curriculum in Medan City.

2 Methodology

The curriculum is the intention and hope that is poured into the form of plans and educational programs carried out by educators in schools. The curriculum is as intention and plan, while the implementation is the teaching and learning process [6], whose natural development process 2013 curriculum is based on philosophical, juridical, and conceptual [7] [5].

The characteristics of the 2013 curriculum are that in each learning the aim is to develop a spiritual, social, knowledge, skill attitude so that it can be applied by students in their daily lives. With the learning experience gained, students will apply it in various situations in schools and communities.

The 2013 curriculum is a competency-based and character-based curriculum. Character-based and competency-based curriculum are outcomes-based curriculum and therefore curriculum development is directed at achieving competencies formulated from the Graduates Competency Standards [5] to answer the challenges of the times that are constantly changing so that students are able to compete in the future, in the national and global context [5].

Implementation is a process of applying ideas, concepts, policies, or innovations in a practical action so as to have an impact, both in the form of changes in knowledge, skills, values and attitudes [8]. Whereas according to the Oxford dictionary Advance Learner's suggests that implementation is "put something to effect" which means "the application of something that gives effect or impact" [9], which is the actualization of learning and the formation of competencies and character of learners [5].

The 2013 curriculum theme is a curriculum that can produce Indonesian people who are: productive, creative, innovative, affective through strengthening integrated attitudes, skills, and knowledge [5].
In implementing the 2013 curriculum in line with the duties and functions of the teacher is to plan and carry out the learning process, assess learning outcomes, conduct coaching and training, as well as conduct research and community service, create an educational atmosphere that is meaningful, fun, creative, dynamic, and dialogical, has professional commitment to improve the quality of education, and set an example and maintain the good name of the institution, profession, and position in accordance with the trust given to him, have minimum qualifications and certification in accordance with the level of authority to teach, physically and spiritually healthy, and have the ability to realize goals National Education [2].

In line with the main duties and functions of the teacher in Law Number 14 of 2015 concerning Teachers and Lecturers, the teacher is a professional educator with the main task of educating, teaching, guiding, directing, training, evaluating, and evaluating students in early childhood education through formal education, basic education, and secondary education [10]. Teacher professionalism is a condition, direction, value, purpose, and quality of an expertise and authority in the field of education and teaching related to one's work that becomes a livelihood [11]. In carrying out the duties and functions as a professional teacher the teacher has difficulties which is a certain condition which is characterized by the obstacles in achieving the goal, so that it requires more effort to overcome. Difficulties experienced by teachers are inseparable from the process of implementing the teaching that takes place in the classroom [12][13].

Research conducted by Anna Silviana Muslimah (2015), the most difficult thing in the implementation of the 2013 Curriculum is the dimension of authentic assessment; and male teachers and non-civil servant teachers are more difficult in carrying out the stages of planning and implementing the 2013 Curriculum economic learning [14]. Then the research conducted by Bagus Prasetyo and Winarno Dwi Rahardjo (2015) said that the implementation of the 2013 curriculum was not optimal [15]. Similarly, the findings of Ika Krisdiana, Davi Apriandi, and Reza Kusuma show that the greatest difficulty level of teachers in solving mathematical problems is 40% of teachers lack understanding about the objectives of the 2013 curriculum and scientific approach, 50% of mathematics teachers have difficulty in designing learning that emphasizes observation and experiment [16]. The thinking paradigm built in this paper is presented in Figure 1 below.

![Fig. 1. Thinking Paradigm](image-url)
This research is a descriptive study, which seeks to describe and explain the objects that have been implemented in State Vocational 2, State Vocational High Schools 4, Vocational High Schools, Exemplary Private Vocational Schools and Raksana Vocational High Schools in August-September 2017. This research variable is the level of difficulty that the teacher is based on the 2013 Curriculum, which means things that prevent the teacher from carrying out the learning according to the 2013 Curriculum. The level of difficulty of the teacher in carrying out learning according to the 2013 Curriculum is measured based on three dimensions of difficulty, namely planning includes the preparation of the Learning Implementation Plan and syllabus, the implementation of the scientific approach, and authentic assessment, which is captured through questionnaires or questionnaires that have been validated and valid for the sampling technique [17]. The population consists of: subject/object that has certain qualities and characteristics set by the researcher to be studied and then drawn conclusions [18]. The population in the study is all public and private vocational schools in Medan that have implemented curriculum 13.

The sample is a part or representative of the population under study [19], from 15 schools that use the 2013 curriculum, there are 5 schools with mechanical engineering expertise programs with 36 teachers with 31 male and 5 female respondents. The data used in this study is primary data. Primary data sources are data sources that directly provide data to data collectors [18]. So, in obtaining this data is done directly to the Mechanical Engineering Vocational Teachers in Medan City and analyzed with descriptive statistics.

3 Result and Discussion

3.1 Data Analysis of Teacher Difficulties in Tasks Teacher Principles and Functions

The results of the data analysis of teacher difficulties in the main tasks and functions of teachers, the categories of tendencies are presented in Figure 2:

Fig. 2. Trend Category of Difficulty in Main Duty and Teacher Functions.

3.2 Analysis of Data on Teacher Difficulties in Implementation of 2013 Curriculum

Trend categories of teacher difficulty level in the implementation of the 2013 curriculum are presented in Figure 3 below:

Fig. 3. Trend Category of Teacher Difficulty in Implementation 2013 curriculum
The results of measuring the level of difficulty of Mechanical Engineering SMK teachers based on the 2013 curriculum implementation for each dimension of difficulty (planning, implementation, and learning assessment) are as follows:

### 3.2.1 Dimension Planning Data Analysis
The results of the category analysis of the level of difficulty for planning dimensions are presented in Figure 4 below:

![Fig. 4. Trend Categories of Difficulty in Planning Dimensions.](image)

### 3.2.2 Analysis of Implementation Dimension Data
The results of the analysis of the category of difficulty level tendencies for the implementation dimensions are presented in Figure 5 below:

![Fig. 5. Trend Categories of Difficulty in Implementation Dimensions.](image)

### 3.2.3 Analysis of Assessment Dimension Data
The results of the analysis of the category of difficulty level tendency for the implementation dimensions are presented in Figure 6 below:

![Fig. 6. Trend Categories of Difficulties in Evaluation Dimensions.](image)
3.2.4 Percentage Description Frequency of each Difficulty Level Category

The results of the overall level of difficulty are clearer, namely the combination of the planning dimension (preparation of the Learning Implementation Plan and syllabus), the dimensions of the implementation of scientific learning, and the dimensions of authentic assessment are in the following figure 7:

![Fig. 7. Percentage description of the frequency of each difficulty level category.](image)

3.3 Inter-Category Data Crosstabs Analysis

Crosstabs analysis to determine the relationship between categorical variables / mechanical engineering teacher identities with the difficulty level of each learning dimension is presented as follows.

3.3.1 Gender

The description of the results of crosstabs data analysis between categories based on male and female sex is presented in the following figure 8:

![Fig. 8. Description of Crosstabs Data Analysis Results Between Categories by Gender.](image)

3.3.2 Educational Background

Description of the results of crosstabs analysis of data between categories based on educational background is presented in the following figure 9.

![Fig. 9. Description of Results of Crosstabs Data Analysis Between Categories Based on Educational Background](image)
3.3.3 Employment Status
The description of the results of crosstabs analysis of data between categories based on employment status is presented in the following figure 10:

![Fig. 10. Description of Results of Crosstabs Data Analysis Between Categories Based on Personnel Status.](image)

3.3.4 School Status
The description of the results of crosstabs analysis of data between categories based on school status is presented in Figure 11 below:

![Fig. 11. Description of Results of Crosstabs Data Analysis Between Categories Based on School Status.](image)

3.3.5 Duration of 2013 Curriculum Implementation
The description of the results of the crosstabs data analysis between categories based on the duration of the 2013 curriculum implementation are presented in Figure 12 below:

![Fig. 12. Description of Results of Data Crosstabs Analysis Between Categories Based on Duration of 2013 Curriculum Implementation](image)
From 36 Mechanical Engineering teachers who entered the research subject, in general for the level of difficulty in the main tasks and functions of the teacher the majority included in the category of not difficult as many as 29 respondents with a percentage of 80.55%, then categories in a row, which is quite difficult category with the frequency of respondents as many as 4 respondents with a percentage of 11.11%, a difficult category with a frequency of respondents as many as 1 respondent with a percentage of 2.78%, and the category is very difficult with the frequency of respondents as much as 2 respondents with a percentage of 5.56% as presented in Figure 2.

The current 2013 curriculum as a learning guide in some schools in Medan City, especially for the five schools that became the sample of the study had used the 2013 Revised 2016 Curriculum. Of the 36 Mechanical Engineering teachers who were included in the research subject, 27 teachers claimed to have implemented the 2013 Curriculum for eight semesters, and the remaining 9 teachers claimed to have just implemented the 2013 Curriculum for six semesters.

From the results of the study, it can be seen that the difficulty level of mechanical engineering teachers in conducting learning based on the 2013 curriculum in Medan City as a whole is in the not difficult category. For more details, it can be seen in Figure 3, that is, the result is 69.44% including the not difficult category, 11.11% the category is quite difficult, 11.11% is in the difficult category and 8.33% is in the very difficult category. Furthermore, the results of the research for each dimension of difficulty indicate that the difficulty level of the mechanical engineering teacher in carrying out the learning planning stages includes the preparation of RPP and syllabus, according to the 2013 curriculum is included in the not difficult category presented in Figure 4, where the percentage is not difficult is the highest of the category the other is 66.6%, the category is quite difficult 13.80% while the hard percentage is only 16.6% and the category is very difficult 2.80%, it is interpreted that in preparing the syllabus and RPP for learning in Medan City it is not difficult to do so.

The structure of the syllabus, Core Competencies, Basic Competencies, and subject matter in the 2013 Curriculum can still be understood well, as well as understanding the structure of the 2013 Curriculum Learning Implementation Plan. The difficult percentage of 16.6% is more in the implementation process indicators in learning scientific and compile assessment instruments with authentic techniques.

Then in carrying out the stages of the implementation of learning with the scientific approach is included in the category is not difficult picture 5. Where the percentage is not difficult is the highest of the other categories. that is 72.2%, while the percentage is quite difficult 8.33%, the difficulty is 16.6% and the category is quite difficult 2.80%. So, both in understanding and implementing the scientific approach in learning the teacher has no difficulty in doing so. In carrying out the stages of the core activities in learning (ranging from observing, asking questions, gathering information, and communicating) according to the 2013 curriculum's scientific approach it can still be done well. The hard percentage of 16.6% is more about the indicator of the process of carrying out scientific learning as a whole.

Furthermore, in carrying out the assessment stages of learning with authentic assessment is included in the category of not difficult can be seen in Figure 6. The percentage is not difficult is the highest of the other categories of 69.40%, while the percentage is quite difficult 11.10%, the difficult category of 11, 1% and which is categorized as quite difficult 3.80%. So, in understanding and conducting an authentic assessment of the 2013 Curriculum the teacher has no difficulty in doing so. Basic concepts of authentic assessment and content of the Competency Standards Graduates of each domain (including the realm of attitudes, skills and knowledge) in the 2013 Curriculum are not difficult to understand. Likewise in the process of
implementing authentic assessments by teachers to students for the realm of attitudes and skills. The percentage is quite difficult to be in the process of implementing authentic assessments that are in accordance with the 2013 Curriculum assessment guidelines.

From all the results of this analysis it can be seen that the dimension that is most difficult for the teacher is the authentic assessment stage. Where the highest percentage of categories is the most difficult, which is 60%, then followed by the implementation stages using the scientific approach with a fairly difficult category with a percentage of 41.67%, and planning stages of difficult categories with a percentage of 37.50%. The mechanical engineering teacher claimed to be quite difficult when going to do an assessment with authentic techniques.

Authentic assessment itself is an assessment that does not merely measure the competency of students' knowledge so that it is quite difficult to apply. Authentic assessment consists of a variety of assessment techniques namely, first direct measurement of students' skills related to long-term educational outcomes such as success at work. Second, an assessment of tasks that require broad involvement and complex performance. Third, process analysis is used to generate student responses to the acquisition of attitudes, skills, and knowledge available. For that authentic assessment must be able to describe what attitudes, skills, and knowledge have or have not been owned by students.

In this case, the teacher has difficulty in assessing where the grades of students must be presented in the form of letters and not numerical values as before. The assessment process begins with reviewing the syllabus as a reference in making the design and assessment criteria at the beginning of the semester. After setting the assessment criteria, the teacher chooses assessment techniques in accordance with the indicators and develops instruments and guidelines for scoring in accordance with the selected assessment techniques. After that, the assessment report form of students in accordance with the 2013 curriculum is in the form of values and/or descriptions of achievement of competencies for the results of the assessment of competencies in knowledge and skills including assessment of thematic-integrated learning outcomes. Then accompanied by a description of the attitude for the results of the competency assessment of spiritual attitudes and social attitudes.

Then the results of the teacher category relationship to the level of difficulty perceived by the teacher in conducting learning based on the 2013 Curriculum is quite influential. This is intended from crosstabs analysis which is then displayed in the form of curves, where each curve has its own pattern. Based on the analysis that male teachers and teachers who are not Civil Servants have more difficulty in carrying out authentic planning and assessment stages in the 2013 Curriculum. Then State University graduates and teachers who implement 2013 Curriculum for eight semesters have more difficulty in performing authentic assessment stages. Meanwhile, public school teachers have more difficulties in planning and assessment stages than private school teachers.

4 Conclusions

Based on the research results obtained through analysis and discussion of "Difficulties Analysis of Vocational Teachers in Mechanical Engineering Expertise Programs in Implementing 2013 Curriculum in Medan City" are as follows:

a. The level of difficulty of the teacher in the main task and function of the teacher generally falls into the category of not difficult that is equal to. However, there are still some teachers in the very category.
b. The level of difficulty of Vocational High School teachers in planning, implementing and evaluating learning based on the 2013 Curriculum in Medan City in carrying out the learning planning stages (preparation of the RPP and syllabus) is included in the not difficult category of 66.6%. While the hard percentage is only 16.6%. The stages of implementing learning with the scientific approach are included in the not difficult category, which is 72.2%. While the hard percentage is only 16.6%. The stages of learning assessment with authentic assessment are included in the not difficult category of 69.40%. While the hard percentage is only 11.1%. The dimensions that are most difficult for teachers in learning based on 2013 curriculum in Medan City are authentic assessment dimensions. That is, compared to the planning dimensions and the dimensions of the implementation of learning, authentic assessment is more difficult. Where the hard percentage of authentic assessment dimension is 60%, planning dimension is 41.66%, and implementation dimension is 34.66%. In general, male teachers and non PNS teachers have more difficulty in carrying out authentic planning and assessment stages in the 2013 Curriculum. Then graduates from State Universities and private graduate teachers who implement the 2013 Curriculum for eight semesters have more difficulty in carrying out the implementation stages, authentic assessments. Meanwhile, public school teachers have more difficulties in planning and assessment stages than private school teachers. So, it should be noted that the implementation of the 2013 curriculum in Medan is better.

Suggestions

Based on the results obtained in this study, several suggestions can be submitted, namely:

1. In the field of learning planning, the teacher should further enhance the competencies in preparing the lesson plan, especially the part of designing learning assessment instruments with authentic assessment techniques that are appropriate to the 2013 curriculum. Therefore, it is expected that teachers are more active in participating in various activities that support competency development in preparing the 2013 Curriculum RPP or attend curriculum workshop.

2. In the field of learning implementation, the teacher should further improve competence in performing the stages of "reasoning" and "creating" activities during learning.

3. In the field of learning assessment, teachers should improve their competence in conducting authentic assessments, both in terms of the overall assessment and in processing and presenting grades into report cards.

4. For advanced researchers should develop research by adding a statement on the questionnaire about the reason respondents said it was difficult or not difficult in implementing the curriculum and developing research at a more diverse population level, and develop research by looking at new problems from the results of the discussions that have been in this paper, so that it can be a reference for future researchers.
References

A Review of Research on The Teaching and Learning of Database Course Problems

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Abstract. The global issue of problems in learning and teaching database subjects is a factor causing learning difficulties for students. Various problems of learning and teaching database systems lead to low learning outcomes, lack of learning motivation and lack of modeling and database design skills by students. In addition to teaching errors in managing learning, the models and approaches used in teaching and learning are not appropriate because they are not in accordance with the characteristics of the subjects and characteristics of students. The solution to the problem of learning and teaching database systems from previous researchers is to collaborate learning models based on the relevance between learning models with the characteristics of database subjects and characteristics of students so that database competencies can be fulfilled so that graduates can compete in the work industry.

Keywords: Database systems, database problems, learning and teaching.

1 Introduction

Database application is one of the important factors of all information systems [1]. The main purpose of studying database applications is to prepare learners to use applications as a tool to gather information and to solve business problems [2]. The database is a course that is published in the curriculum of vocational high schools, colleges of informatics and engineering education [3] [4]. In general, learning competencies and teaching database systems are teaching participants can have competence as database administrators who are able to design and resolve database system problems in an organization.

2 Methodology

An in-depth study of learning and teaching the subject of the database system was conducted to obtain real world facts problems in learning the subject. This study also identifies the difficulties of the instructors in achieving learning competencies, as well as the difficulties of students in learning the database which results in low learning outcomes. This study also highlights aspects of concepts, strategies and perspectives of previous researchers in overcoming research problems. The author hopes that this in-depth study can give birth to a new perspective for writers to conduct research on the development of effective and adaptable solutions.
learning models in their implementation to address the problem of teaching and learning processes (PBM) in database systems, both at the vocational high school level and college level.

In database learning, some previous researchers suggested that in general, the design of learning in computer science, especially in database programming, is quite difficult [3]; [4]; [5]. Technical knowledge of learners is very lacking in developing database information technology that is in accordance with system requirements. Learners find it difficult to interpret the problem of existing case studies. Students have difficulty understanding the concepts and techniques of database modeling for a complex real-world case study (Mukhlisulfath Latief, 2010). Learning that is held conventionally and PBM that is centered on teachers / lecturers has an impact on the monotonous and boring learning atmosphere for students is a factor that causes low learning outcomes.

management of learning, such as the introduction of database concepts, where students are first introduced to the knowledge of database worksheets (spreadsheet ms.excel) and then database management using database application (ms.access) [6]. Database PBM is difficult to achieve learning competencies, because there are certain parts / material that are difficult to understand and are controlled by students in general, such as difficulties in memorizing and implementing SQL (Structured Query Language) [7]. The learners have difficulty doing conceptual data modeling procedures, especially material dependency between entities, key usage, arrangement of relations between files in normalization techniques and Entity Relationship Diagram (ERD).

lack of student skills in analyzing, designing and implementing databases to solve complex abstract problems relating to the problem of organizing data in each institution or company. This has an impact on the lack of industry confidence in recruiting graduates to be placed as modern information system analysts and designers [3][4] [2]. The high level of competency in the labor market in the global era forces especially the departments of informatics to produce graduates who can compete in the world of work. The conventional learning methods and teaching of database systems are no longer effectively applied specifically to the abstract domain and database design in complex cases [8][7].

The results of the study which suggested the location of teaching and learning problems in database education as an indication of the causes of learners experiencing learning difficulties and low learning outcomes, are presented in the following scheme:

Fig. 1. experiencing learning difficulties and low learning outcomes
3 Result and Discussion

Some previous researchers suggested that the problem-based learning and project-based learning model is effective and appropriate to be applied to the database system subject. Problem Based Learning (PBL) models can improve problem solving skills, improve learning outcomes, overcome student learning saturation (Khusnul Qotimah dkk, 2015; Didih Aditiyawarman, 2016; Asmala I Agustin, 2010). In terms of achieving competency in the ability to analyze and solve problems, some previous researchers applied learning that made the problem a basis of learning in improving problem solving skills for real problems in institutions or organizations [3][7] [2].

The Project Based Learning (PJBL) learning model can improve skills in designing a database system model, results and motivation to learn [9][10]. Some models and teaching and learning approaches that are effectively applied to database learning are constructivist approaches [4][7], taxonomy bloom approach [5]; JigSaw learning method, collaborative learning method [1], “Learning By Doing” concept [6], Inquiry learning model. [8] collaborating problem-based learning methods and projects for database subjects at three European universities.

Database competencies include [1][11][12] Knowledge of the characteristics, goals and structure of a relational database. 2) Capacity to properly define, create, use and manage relational databases. 3) Capacity to evaluate alternative implementations in the relational database regarding several quality criteria. 4) Knowledge of the basic aspects of data storage legislation, and security aspects related to the implementation of these regulations. 5) Knowledge of reliability[13] issues related to the use of relational databases and existing mechanisms to help avoid them. These competencies are in accordance with the characteristics of Database subjects in the form of procedural and declarative knowledge and are applicable according to real conditions so that the match is taught by applying a combination of two learning models, namely Explicit Instruction (EI) with Project Based Learning (PJBL), (Asmala Izza, 2010).

[2][14] explains the database has characteristics in the form of design procedures that support the problem solving process. [7][15] that the art of database design is difficult to learn. Constructivist approaches must be used, and project-based approaches alone are not enough because the skills needed by students are skills in modeling the reality of an organization from various fields of science. The database is related to information technology both in terms of material content and technological devices used to support learning. The link between technology[16] and project-based learning[17] is that learners learn how to use information and communication technology devices in real contexts. The technology integrated into the PJBL builds learning skills using information technology while learning what information and communication technology is Phyllis C. Blumenfeld (1991) suggests, “despite considerable potential, project-based education is not without problem”. In order to achieve the overall learning objectives of the PBL, real problems are needed that involve students actively solving real problems to build real solutions. The Project Based Learning approach has been widely used by lecturers in the western world, because this approach is quite useful in designing effective learning.
4 Conclusion

An in-depth study of learning and teaching the subject of the database system was conducted to obtain real world facts problems in learning the subject. This study also identifies the difficulties of the instructors in achieving learning competencies, as well as the difficulties of students in learning the database which results in low learning outcomes. This study also highlights aspects of concepts, strategies and perspectives of previous researchers in overcoming research problems. The author hopes that this in-depth study can give birth to a new perspective for writers to conduct research on the development of effective and adaptable learning models in their implementation to address the problem of teaching and learning processes (PBM) in database systems, both at the vocational high school level college level.

References


Development of Interactive Learning Media in Indonesian Language Subjects at VIII Grade of Junior High School

Merry Damanić, Abdul Hasan Saragih, R. Mursid

Abstract. The implementation the objectives of Indonesian language subjects in the 2013 curriculum was presented using a text-based approach. In reality, there were still many students who have not been able to construct the text especially the news text. Based on the need's analysis carried out directly on students and teachers at State Junior High School 5 of Tanjung Morawa, that interactive learning media was needed in improving learning outcomes of news text material. The development of interactive media Adobe Flash CS6 was a solution. Interactive Media Adobe Flash CS6 developed using research adopted on a model developed by Lee (2004). The effectiveness of using Adobe Flash CS6 learning media was 82.44%, and without using Adobe Flash CS6 media was 74.37%. Data prove that the use of Adobe Flash interactive learning media material News text was more effective in improving student learning outcomes.

Keywords: Interactive media learning, formatting, Indonesian language, news text

1 Introduction

Indonesian Language Learning aims that students have the ability to communicate effectively and efficiently in accordance with applicable ethics, both verbally and in writing. Implementing the objectives of Indonesian Language, the Indonesian language learning in the 2013 curriculum was presented using a text-based approach. Text can be in the form of written text or oral text. Text is a complete expression of the human mind in which it has a situation and context.

Writing is used by someone to record or record, convince, report or notify, and influence others. Writing is a whole series of activities of a person to express ideas and convey them through written language to the reader community to be understood [1].

One of the basic competencies of writing skills was that students were able to write news texts. The core competence of news text in the eighth grade of junior high school was that students were able to identify the elements of the news text (boast and motivate) that were heard and read, examined the structure and language of news texts (boast and motivate) that were heard and read by the news, summarized the contents of the news (boast and motivating) which were read and heard, and presented data, information in the form of news verbally and in writing with regard to structure, language, or oral aspects (pronunciation, intonation, expression, kinesics).
The results of observations conducted by researchers at State Junior High School 5 of Tanjung Morawa, the teacher stated that learning to write news texts for students at the school was still low. The low results were seen from students' learning interests and the results of writing news text training. The teacher also stated that in the practice of writing news texts that have been done, students still lack understanding in the development of elements of 5W1H, who, what, where, when, why, how to write news texts.

One of the ways that can be done to improve students' writing skills into enjoyable learning was by active learning by developing teaching materials that were in line with students' characteristics and needs. The development of Adobe Flash CS6 interactive media teaching materials aimed to enable students to learn independently with the guidance of the teacher, or without teacher guidance. This teaching material was a solution in learning to write news texts. Media was one component of communication, according to the Association for Education and Communication Technology [2].

Interactive multimedia applications used two different software platforms, Adobe Flash CS5 and HTML5 with CSS [3]. This study described applications developed on two different platforms evaluated with one class of 35 students based on four performance criteria to determine students' responses to media use. Experimental results showed that students felt comfortable with the use of Adobe Flash CS5 compared to HTML with CSS.

Developing interactive multimedia based on Adobe Flash Professional CS6 chemical balance in learning can improve learning outcomes and a positive response from students so that students were motivated to learn chemistry [4].

2 Methodology

This research was conducted at eighth grade of State Junior High School 5 of Tanjung Morawa in the first semester of 2018/2019 academic year. This study began in July to August 2018 to achieve the purpose of this study, namely the product of interactive media learning of text news in Junior High School (SMP) with Adobe Flash CS6.

Adobe Flash CS6 program was developed to achieve the purpose of this study, namely the product of interactive media learning of text news in State Junior High School (SMPN) with the overall study used research adopted from the model developed [5] with the following stages:

a. Assessment,
b. Needs Assessment,
c. Front-end analysis
d. Design
e. Development Implementation,
f. Evaluation.
g. Evaluate as shown in the following Figure I [5]
Table 1. Assessment Criteria

<table>
<thead>
<tr>
<th>No.</th>
<th>Categorization</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very good</td>
<td>85% ≤ x ≤ 100%</td>
</tr>
<tr>
<td>2</td>
<td>Well</td>
<td>75% ≤ x &lt; 84%</td>
</tr>
<tr>
<td>3</td>
<td>Medium</td>
<td>65% ≤ x &lt; 74%</td>
</tr>
<tr>
<td>4</td>
<td>Not good</td>
<td>55% ≤ x &lt; 64%</td>
</tr>
<tr>
<td>5</td>
<td>Very bad</td>
<td>0% ≤ x &lt; 55%</td>
</tr>
</tbody>
</table>

Research hypothesis

a. Interactive learning media on news text with Adobe Flash CS6 was suitable to be used as a learning medium in order to achieve the elements of usability, effectiveness and attractiveness of students.

b. Interactive learning media on news texts with Adobe Flash CS6 was more effective to be used to improve the learning outcomes of Indonesian language with news text material in eighth grade of SMPN 5 Tanjung Morawa in 2018/2019 academic year.

Hypothesis 1 : H0 : μA1 ≤ μA2
Ha : μA1 > μA2

Hypothesis 2 : H0 : μB1 ≤ μB2

3 Result and Discussion

Table 2. Expert Validation of Materials, Design And Media

<table>
<thead>
<tr>
<th>No.</th>
<th>Validator</th>
<th>Average Percentage</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Expert material</td>
<td>86.20%</td>
<td>Very good</td>
</tr>
<tr>
<td>2</td>
<td>Learning design experts</td>
<td>89.20%</td>
<td>Very good</td>
</tr>
<tr>
<td>3</td>
<td>Media expert</td>
<td>85.79%</td>
<td>Very good</td>
</tr>
</tbody>
</table>

Table 3. Test Result

<table>
<thead>
<tr>
<th>No.</th>
<th>Trials</th>
<th>Average Percentage</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Individual trial</td>
<td>87.15%</td>
<td>Very good</td>
</tr>
<tr>
<td>2</td>
<td>Small group trial</td>
<td>89.45%</td>
<td>Very good</td>
</tr>
<tr>
<td>No.</td>
<td>Trials</td>
<td>Average Percentage</td>
<td>Criteria</td>
</tr>
<tr>
<td>-----</td>
<td>---------</td>
<td>--------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>3</td>
<td>Field trial</td>
<td>91.11%</td>
<td>Very good</td>
</tr>
</tbody>
</table>

It was seen that learning using interactive media with Adobe Flash CS6 obtained 43.33% on the average, 26.66% below the average, and 40.00% above the average.

Based on the data obtained, it can be seen that the news text learning outcomes scores on students who learned using Adobe Flash CS6 interactive learning media, obtained the lowest score of 63 and the highest score of 93, the average score was 74.37, standard deviation (Sd) 7, 54, median (Me) 73.00, and mode (Mo) 73.00.

Effectiveness of Indonesian language learning media with Adobe Flash CS6. obtained as follows:

\[
X = \frac{X_{100}}{100} = 82.44\%
\]

The effectiveness value of Indonesian language learning media without Adobe Flash CS6 is obtained as follows

\[
X = \frac{X_{100}}{100} = 74.37\%
\]
4 Conclusion

Based on the results of the research, development and discussion previously stated, it can be concluded:

a. Products in the form of Indonesian language learning interactive media with Adobe Flash CS6 of news text material at the eighth grade of SMPN 5 of Tanjung Morawa in 2018/2019 academic year had the results deserved to be the final product that can be disseminated and implemented to the users. This was clarified by several stages of trials, both trials from material experts, trial of expert learning design, trial of media / graphic design experts, individual trials, group trials and average field trials of all categories are very good.

b. Indonesian language learning media using Adobe Flash CS6 interactive media of news text material was higher than the Indonesian language learning outcomes without using Adobe Flash CS6 interactive media of news text material at the eighth grade of SMPN 5 of Tanjung Morawa in 2018/2019 academic year. These results indicated that the developed interactive multimedia can motivate students to explore the material [6]

References

How to Teach Critical Thinking: A Blessing or A Learning Process?

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Abstract. The quality of our life, including how we learn and how we adapt to the various situation and that of what we produce, make, or build depends precisely on a quality of our thought. Shoddy thinking is costly, both in money and in the quality of life. Excellence in thought, however, must be systematically cultivated. This paper will review the critical thinking, about what is critical thinking skills? can it be trained through the learning process? Is gift contribution to critical thinking skills? What kind of learning process that can improve critical thinking  skills? Through this paper, we can use some of the most important information to improve our critical thinking skills.

Keywords: Critical thinking skills, active learning, gifted child, disposition

1 Introduction

Many people decide to make changes in their daily lives based on anecdotes, or stories from one person's experience. For example, let's say that your aunt told you that she takes a vitamin C supplement every day. Additionally, she told you that one morning she was running late for work and forgot to take her vitamin C supplement. That afternoon, she developed a cold. She now insists that you take vitamin C every day or you will get sick, just like she did in her story. Many people hearing this story would just accept this and think, 'To avoid getting sick I should take vitamin C.'

The main questions are should you believe everything that you hear and read, just because other people said so. Unfortunately, most people do that; consciously or not. We sometimes feel it would be easier to believe what said by others rather than having efforts to find appropriate information. This is one reason that causes us to fail to become critical thinkers. Critical thinking (CT) is often described as a metacognitive process which means the ability to use prior knowledge to plan a strategy that consisting of a number of sub-skills which if we used appropriately, increases the chances of producing a logical conclusion to an argument or solution to solve a problem [1]. The main problem here is how to ensure that whether we already perform critical thinking skills appropriately, therefore in order to improve CT ability, we must be aware of what goals we want to meet and what steps should be done in data collection in order to produce the best solution or answer.

In the other hand, there is an assumption said that the critical thinking skills are a natural talent possessed by some individuals. When we look at the two students who assign to completing tasks by the teacher. One of the students carefully observe the directives given by the teacher, but one of the students had only heard but not fully give notice. When the task turned out, duties collected from students who listened to a serious direction is no better than the students who simply hear is not too serious. This will lead to the question Is critical
thinking is a natural talent possessed by the individual? However, this situation will also make students who have heard the direction of the teacher carefully, but the results obtained are not too good to be feeling desperate and fail, this will lead this typical of the student be lazy and feel that all his effort is useless.

Ironically, as it turns out, the approach in teaching subject matter to our student sometimes only focus on how we deliver information to the student and forget the main things in learning process for the graduate level. Lloyd and Bahr’s research further revealed that while 37% of academics instructing or assessing CT in university courses at least acknowledge the dispositional and self-regulatory aspects of CT, only 47% described CT in terms of involving processes or skills. Meanwhile, the student needs to reach the highest level in his/her thinking ability for competing in work field in the future but many types of research show that many educational systems did not really focus on improving. For example, Turkey education system aims to improve critical thinking skills, however the reality show it has been identified for the most part as a “read and repeat” model that conduct in the learning, this typical of learning process is reducing change for student to improve their thinking skills and to explore their ability. Regarding this issue, the teacher needs to notice that one of the cores of the learning process is to teach the student to think as a foundation to became an active learner which will lead them to become a long-life learner.

This article using document analysis as tools to reviewing or evaluating research and any other document to elicit meaning, gain understanding, and develop empirical knowledge about what is critical thinking skills? Can it be trained through the learning process? Is a gift contribution to critical thinking skills? What kind of learning process that can improve critical thinking skills?

2 Methodology

In daily life, we will face many situations that ask us to think critically, but sometimes we might fail. Have you ever seen a television show featuring politicians who were arguing about a policy? Do the politicians provide strong arguments to support his opinion? Are the politicians provide factual data? Or whether you think any politician is just boasting? Then, do you choose your side, what make you choose your side? Do you search for the real information and data, before you choose your side, or you just choose because it feels like make sense for you, or just because your friend affected you?

Critical thinking (CT) in this paper is conceptualised as an operative example of higher order thinking that defined as a skill of taking responsibility and control of one’s own mind [2], or as logical and reflective thought which focuses on a decision about what to believe and what to do [3] allows for efficient and effective evaluations. In addition, the examination of those structures or elements of thought implicit in all reasoning: purpose, problem, or question-at-issue; assumptions; concepts; empirical grounding; reasoning leading to conclusions; implications and consequences; objections from alternative viewpoints; and frame of reference.

Critical thinking involves a variety of skills such as the individual identifying the source of information, analyzing its credibility, reflecting on whether that information is consistent with their prior knowledge, and drawing conclusions based on their critical thinking [4]. In the literature, CT skills are considered to be essential for the promotion of metacognitive understanding [5], which is referred to higher order thinking which involves active control
over the cognitive processes engaged in learning. Activities such as planning how to approach a given learning task, monitoring comprehension, and evaluating progress toward the completion of a task are metacognitive in nature. Therefore, Critical thinking is an individual effort to seeking the truth information, analyze all related data to find the answer to the problem. This whole process will lead into some action that individual take through a process that requires critical thinking skills in selecting all the possibilities that exist and accompanied by supporting factual data.

A thought is difficult to be affected unless the support data is given consistently and rationally, through the critical thinking process, the individual will also evaluate whether the results of his thinking process has been able to solve existing problems. Critical thinking can also be called with the thinking that has a direction because it focuses on the expected results [6] Halpern in [7]. Critical thinking leads to a way of thinking individuals who require support to a trust. This definition of critical thinking is not simply accepting or rejecting a statement but includes a set of abilities and dispositions that help in deciding what to believe or do when employed.

Watson and Glaser [8] adds that critical thinking can be defined in three main aspects. First, an attitude looking information that involves the ability to recognize and accept the information and facts right. Second, knowledge of how the deduction, abstraction, generalization valid involving the accuracy of the facts logically and third is expertise used and applied either in attitude or knowledge. I believe that with involves many activities that require a thinking skills might give chance to practice logical thinking and deliver it decently, however people should notice that before become expert in this thinking skill people need to empowering their metacognitive and reflective ability. [3] stated that there are six elements that have the mental checklist for critical thinking known as FRISCO: Focus, Reasons, Inference, Situation, Clarity and Overview. In approaching any situation, students have to be focused on identifying the main arguments or problem as guidance for students not to get distracted during the thinking process.

The dimensions of critical thinking also developed by the American Philosophical Association Delphi [9] identifies six cognitive ability is a key concept of critical thinking. The sixth aspect is further defined with the following explanation:

a. Interpretation, which refers to understand and express meaning or experience, situation, data, assessment, rules, beliefs, customs, procedures, and criteria.

b. Analysis means able to identify the purpose and relationship of statements, questions, concepts, description or other forms that represent intended to express confidence, judgment, reason, information, and opinions.

c. Evaluation. In this part, evaluation means to measure the credibility of statements or other representations which are measured by individual perception, experience, situation, judgment, belief or opinion; and to measure the strength of the relationship between the logical statements, descriptions, questions, and other various forms of representation.

d. Conclusions are intended to identify and ensure that each element can draw conclusions reasoned, to establish estimates and hypotheses, to consider the relevant information and to show the consequences derived from the data, statements, principles, facts, judgments, beliefs, opinions, concepts, description, questions and other forms of representation.

e. The explanation refers to explain the results of an argument, to justify a reason in terms of facts, concepts, methods, criteria and consideration of circumstances involved in determination the results; and to represent a form of reason in the form of a convincing argument.
f. Self-regulation, which is the consciousness of individuals to monitor their own cognitive activities.

Others opinion about dimensions of critical thinking was develop by Facione [10]. Facione suggests seven dimensions of critical thinking dispositions which are the curiosity, open-minded, systematic, analysis, truth seeking, confidence in critical thinking and maturity. Seven dimensions are then compiled into The California Critical Thinking Disposition Inventory (CCTDI) (see Appendix Figures 1).

However, among the several dimensions associated with critical thinking dispositions above, it is interesting dimension raised by [10] which made judicious as one important dimension of the critical thinking skills. People who have good critical thinking skills, also need to have judicious in thinking. Occasionally, there are some things that we can not convey directly to others, in this case, words without filtering might cause others false interpret what we mean, so we need to have to use words that are subtler and more discreet, therefore people can understand the intent we truthfully. It is very necessary to remember that being critical thinker doesn’t mean that we reserve the right to hurt the feelings of others through our opinion, but critical thinking demands the ability to analyze a variety of circumstances with systematic, then choose the best option and deliver a precise opinion on others. [11] mention that since critical thinking is always ‘critical thinking about X, which is referred to thinking about something, it follows that critical thinking is intimately connected with other fields of knowledge. As we begin to think critically to get an answer or give an opinion, the first thing we do is associate the source with the prior knowledge then analyze more detail information to convey the truth information before judging. However, somehow people misperception with connecting between critical thinking with skepticism, or suspension. To avoid this misperception, we need to make sure that when we deliver our thought already strained by collecting accurate data and present it clearly and without bias or negative purpose. [12] notice to be a critical thinker, you will need to develop the habit of testing opinions—your own as well as other people’s—before trusting them. Here are seven effective ways of doing so.

a. Consult everyday experience: Consider your personal experience as well as what you know to be the experience of other people.

b. Consider the opinion’s likely consequences. One way to recognize that an opinion is flawed is if it leads to unintended—and sometimes undesired—consequences.

c. Consider the implications. This approach entails identifying and examining related ideas suggested by the opinion. Let’s say the opinion is, “What people view in movies or on television has no effect on their behavior.” (Media spokespeople often say this in response to complaints that graphic sex and violence have a negative social impact.) According to my own opinion media has big rules in involving the way of people thinking. A few months ago, there was a bomb attack in Paris it caused a lot of died people. Media reported it many people around the world sympathetic to this issue, then we can look at a variety of social media such as facebook profile person to replace her with a French flag background for sympathy. On the other hand, the media also reported and exhale speculation about the bomber were killed by holding the passports of certain countries if we think critically is not this really impressed fetched? at some pictures circulating in the media that we could see a passport that is still intact, but the body of the bomber that has been destroyed. Media sometimes lead us to follow and believe their news, but we are the ones who can filter correct information by using higher order thinking skills. (see Appendix Figures 2)

d. Think of exceptions. This approach is useful when you are evaluating an opinion that expresses a general rule. The more exceptions you can think of, the more suspect the opinion is. Carl Rogers, a famous psychologist, wrote: “One of the basic things which I
was a long time in realizing, and which I am still learning, is that when an activity feels as though it is valuable or worth doing, it is worth doing”.

e. Think of counterexamples. Suppose an author is arguing that parents should not give children responsibilities until they are in their teens, and supports her argument with a number of case histories like this one: “I know a person who was given responsibilities such as picking up his clothes and toys at age 3; taking out the garbage at age 6; and raking leaves, washing dishes, and doing laundry at age 10. Today he’s in his mid-thirties and resents having had all those chores.” A counterexample would be the case of someone (perhaps you) who had similar responsibilities in childhood and now regards the experience as valuable. Regarding the story about give children responsibility since their childhood, we can take an example to Japan Elementary School Educational system, where children are taught a system of moral values through four aspects: Respect Yourself (Regarding Self), Respecting Others (Relation to Others), Respect for the Environment and beauty (Relation to Nature and the Sublime), as well as valuing the group and Community (Relation to Group and Society). Therefore, when engaged in an argument we should be able to convey the opinion of the other side by adding relevant data to support our opinions. (see Appendix Figures 3)

f. Reverse the opinion. This test consists of taking the exact opposite of the opinion you are examining and determining if a case can be made for it

g. Look for relevant research. There are many different information sources: journal articles, books, newspapers, government publications, data sets, websites, videos, interviews--these are just a few of the places where you might find the information you need.

Furthermore, and perhaps more important, we might improve our critical thinking skills through critical dialogue, the clash of divergent views, and possibly other activities, to make it progressively more suitable in general and to specific situations that require innovative forms of critique [13]. Although there is no known objective standpoint for this work, varied perspectives in dialogue can allow for new understandings and improved forms of practice—including critical thinking practice need to be developed.

As we can conclude critical thinking is purposeful, reasoned, and goal-directed. It is the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions. When we think critically, we are evaluating the outcomes of our thought processes how good a decision is or how well a problem is solved.

### 3 Result and Discussion

#### 3.1. Critical Thinking: A Blessing Or A Learning Process?

There has been much debate on the question 'what is critical thinking? While there are still disagreements about matters of detail, the considerable agreement has been achieved that critical thinking is a combination of abilities and dispositions. The most influential characterization of critical thinking is due to [3]. According to Ennis, to think critically in some discipline or subject is to display these dispositions and abilities within that discipline or subject.

Now we start to figure out, are critical thinking dispositions came from a learning process or it is a blessing that is owned at birth? When baby starts "talking", baby flaunting their budding language skills. Sure, you don't have any idea what the baby saying, but this gibberish will eventually lead to real words. Baby chatter also gives you a peek into her cognitive
development, as baby memorizes and repeats sounds, takes a time to think about what the baby wants to "say," and learns how to use verbal and nonverbal actions to express she/he wants and needs. Obviously, there is a social component, long before baby says a meaning word, baby learns the rules of language and socialization by watching how you react to her sounds and too conversational partners as you take turns talking. Babies are hardwired to learn the language and are affected by how others engage verbally with them. Baby verbal skills will progress through stages as her vocal mechanism matures and she increasingly relates to her environment.

Critical thinking skills are also associated with the development of one's language. A critical thinker must be conveyed their idea through words with clear and precise, so the purpose and content delivered in accordance with the objectives can be achieved. Meanwhile, as previously described that actually children interested in many things, children spend a lot of time with developing critical questions to adult, and somehow many of this question it is difficult to answer by the adult or even adult think it is not important to answer the children question. However, maybe due to various reasons critical thinking skills stagnated. Here are some reasons why critical thinking skills in children experiencing congestion:

a. Parents effect. The family is the child's early education center. Children begin to imitate a variety of things from the nearest environment, here parents have an important role in providing the basics of character formation and development of affective, cognitive and psychomotor for children. However, sometimes without parents realize, the way they interact with children can be a blade turned a devastating effect on children. We can see parents who may for reasons already tired of working all day, so when the children urge to play or talk, parents ask children to silent even did not heed the request.

b. The lack of educational system or lesson planning's. In the various educational systems in the world, there are still many education systems are focused on only delivering the subject matter. Assuming that the school only provide course material, then the child is not trained to apply critical thinking.

c. The influence of the media. Have you ever thought that sometimes media makes you just be a follower? Media provide many kinds of information, which is with that kind of information we can filter the information, but sometimes the opposite happens.

d. The negative effect of technology. Reading for pleasure, which has declined among young people in recent decades, enhances thinking and engages the imagination in a way that visual media such as video games and television do not improve critical thinking.

e. The environmental impact of the critical thinking skills. Sometimes we wonder why a group of people can do things that harm others, such as attacking or hurting. A social psychological theory states that people will have the possibility of loss of identity when they are in a social group so that the person will most likely have to follow the values or doctrines in the group.

Nowadays, as the rapidly change of technology and the use of social media most people are easily let the other person, news or information from the media suggest some idea, information, beliefs into their thought, does not matter whether it is right or wrong. People tend to began to assess and justify one or another group with that information. However, this typical of thinking will somehow directly direct to prejudice among people. As we now, prejudice will lead to many negative effects. Even though, we are now in the era that many people going to school even university to get the education, somehow the lack of critical thinking skills caused people only believe what they hear and see without seeking the truth information. As we can see in the media many people died just because the conflict of misunderstanding and lack of critical thinking in processing information.
How one people think is different from other people's way of thinking, there is no way to think exactly the same. This is often referred to as a difference in perception or viewpoint. Become a critical thinker is not as an obligation but a necessity. Encounter varying complexity in everyday life that constantly changing, each individual is required to be able to adapt and master the various rhythm in everyday life. With so many problems faced, critical thinking skills will help the individual to be more resilient to take the best decision. [14] in the literature develop the concept of identifying the factors that influence the development of critical thinking skills in individuals, especially in the educational setting. These factors are (i) educator; (ii) students which are included in this variable is the level of involvement of students in a material, motivation and interest of students to the material provided; (iii) individuals characteristics, which are included in this variable such as gender, age, ethnicity, socioeconomic level, intelligence, and education; (iv) learning style determines on how individuals adapt to the learning environment; (v) another factor that can affect the development of critical thinking skills of individuals is related to the educational system of class size, the size of the institution and the environmental elements. It presents a challenge for students, teachers and teacher educators to identify and recognize their own beliefs about learning and effective teaching and to clarify, develop, and involves a variety of learning.

Now we will begin to examine whether critical thinking skills generated through the learning process or individuals who have above-average ability or gifted that have the critical thinking skills that better? A Recent study by [15] investigated the critical thinking skills of fourth-grade students from a school district in Texas, including 45 identified gifted students and 163 general education students. Identified gifted students outperformed general education students on both the Cornell Critical Thinking Test and the Test of Critical Thinking, the result Identified gifted students demonstrated advanced critical thinking skills compared with general education students. Based on this research we might conclude that the critical thinking skills are the ability obtained from birth, where a gifted child will have the critical thinking skills better. I agree that the IQ (Intelligence quotient) better will make a positive contribution to the various capabilities of individuals, including critical thinking skills. In addition, in his research Kettler mention about relevant literature identifies several characteristics representing advanced skill development typical of gifted students. First, there is a relationship between advanced cognitive ability and processing speed, students with higher levels of intelligence generally process information faster than average-ability peers on both simple and complex tasks Second, gifted students are generally more thorough problem solvers than average-ability peers. Gifted students have also demonstrated a wider variety of strategies during problem solving than age peers. Fourth, gifted students generally are able to sustain attention to a problem or task in ways their nongifted peers do not. Fifth, evidence suggests that students with higher levels of cognitive ability have superior memory and more efficient retrieval when compared with nongifted peers. However, in spite of some attention afforded to developing critical thinking skills among gifted students, the literature of gifted education has not actively advocated for using documented levels of critical thinking as a foundation on which to differentiate instruction.

Based on the above presentation, we might draw the conclusion that indeed gifted children who have various advantages in displays critical thinking skills. They are supported by a wide range of capabilities like cognitive ability, problem solver skills, the wider variety of strategies, superior memory and sustain attention to a problem that really need to become the critical thinker. I agree that the ability is above average, children with gifted abilities will be able to explore the critical thinking skills they have. But it should be noted that despite a sharp knife when not in use or sharpened in the end it will be blunt. The same would apply to
gifted children who are not properly trained and stimulated, then the critical thinking skills may not be used properly. Critical thinking skills are not capabilities that will continue to be owned by any individual. The ability of critical thinking requires effort and willingness of individuals to continue to nurture it because the problems each individual facing is not the same every day so that the individual must always be ready with the problems that may arise. The more often people train and use critical thinking skills they have will help improve the quality of critical thinking skills.

Therefore, to train critical thinking skills to need a media that can help to bridge the increase of critical thinking skills, this applies to all individuals both children who have average ability or gifted. Media here meant education, education that has a clear plan and appropriate method can help improve critical thinking skills. One method that can be used to improve education is the active learning method. Active learning methods geared student to participate in the whole process of learning, not only mentally but also physically involved.

3.2. Critical Thinking And Learning Process

The mission of educational institutions is to encourage the student to become a critical thinker, but in fact, the belief of educators to create is nonlinear in student learning methods. In a study conducted by [16] found that most educators only understand the critical thinking skills based on personal experience rather than on theory. In addition, educators also indicated that they have no formal training in developing a method of learning that can encourage critical thinking skills. Nevertheless, educators believe that what they understand about critical thinking can meet the objectives to be achieved in the classroom. [17] explain that critical thinking is the ultimate goal of higher education. In most high schools, education levels are still at "lower-order thinking". Students are mostly passive in receiving the information and the information obtained is used only in doing the test. Whereas the main purpose of teaching students is to teach students how to think, that will help students become learners and thinkers who can steer yourself (self-directed).

Critical thinking skills can be improved in classroom activities when students are required to actively solve the problem. For example, when students are assigned to define or clarify an issue, students will assess which information is relevant and irrelevant, seek additional information is needed and formulate the right questions. By encouraging students to analyze, synthesize and evaluate when students are required to solve the problem, educators will also help students become good thinkers [18].

Teachers have an important role in helping students to improve their understanding, knowledge, activities, problem-solving skills, observation and other learning activities. Schools and teachers can help prepare students to meet the needs and demands of the social environment. Teaches things that are generally not efficient in preparing students for their future. We hypothesize that much of the reason students do not engage in these behaviors is because the educational environment provides few opportunities for this process. Students ought to be explicitly exposed to how experts engage in critical thinking in each specific discipline, which should, in turn, expose them to the nature of knowledge in that discipline.

Active learning is a learning accustom students to learn actively. When students learn actively, it is meaning that students who dominate the learning activities. In addition, student actively uses the brain, either to find the main idea, from lectures, solving problems, or apply what they had learned into the problems that exist in real life. The core elements of active learning are student activity and engagement in the learning process. Active learning is often contrasted to the traditional lecture where students passively receive information from the instructor. During the process of teaching and teachers tend to use conventional learning
models. Learning with these conventional methods are more highly abstract and theoretical. For example, in mathematics, students crammed with lots of formulas to memorize. So when given the word "mathematics", which imagined in their minds only so many formulas and calculations difficult problem.

The American Psychological Association Task Force on Psychology Major Competencies (2007) identified critical thinking as one of 10 learning goals for psychology majors. There is much evidence that critical thinking skills can be taught and learned [19]. [20] proposed a four-part model for teaching critical thinking skills that consists of (a) explicit critical thinking skills instruction, (b) encouraging students’ disposition or attitude toward effortful thinking and learning, (c) directing learning activities in ways that increase the probability of trans-contextual transfer, and (d) making metacognitive monitoring explicit and overt. Through a supportive learning atmosphere, it can facilitate the individuals to develop critical thinking skills. Educational institutions must realize that it is important to develop thinking skills in students, explicit instruction in critical thinking causes students to transfer those skills taught in the classroom to their lives.

4 Conclusion

[21] wrote that after more than 20 years of lamentation, exhortation, and little improvement, maybe it’s time to ask a fundamental question: Can critical thinking actually be taught? A Recent study by [15] investigated the critical thinking skills of fourth-grade students from a school district in Texas, including 45 identified gifted students and 163 general education students. Identified gifted students outperformed general education students on both the Cornell Critical Thinking Test and the Test of Critical Thinking, the result Identified gifted students demonstrated advanced critical thinking skills compared with general education students. Based on this research we might conclude that the critical thinking skills are the ability obtained from birth, where a gifted child will have the critical thinking skills better. In addition, decades of cognitive research point to a disappointing answer that critical thinking can’t be taught. People who have sought to teach critical thinking have assumed that it is a skill, like riding a bicycle, and that, like other skills, once you learn it, you can apply it in any situation.

Critical thinking is not a set of skills that can be deployed at any time, in any context. It is a type of thought that even 3-year-olds can engage in—and even trained scientists can fail in. And it is very much dependent on domain knowledge and practice, furthermore in classroom activity method of learning hold important rules for increasing critical thinking skills by continue practice [21]. This statement is consistent with the statement [2] which states that a professor or educator must create activities and tasks that can actively encourage students to learn the material provided which can encourage critical thinking skills in students. The teacher can ask students to learn first before starting the learning process, so student already having a concept and basic principles regarding the material. This concept according to Elder and Paul can be divided into three main ideas. First, the proper technique is given by the educators, students can internalize information and concepts that they get even the new information. Second, internalization might be not enough, teachers should continue to encourage students to continue to think about the materials that get, therefore, a teacher might us technique like short writes, where students are asked to write a conclusion and what information they get during the material submitted. Lastly, in order to develop critical thinking skills, students are encouraged to engage in discussions with other students. This process
involves the process of expression and questions so that each student has the opportunity to evaluate their own and other people's opinion, the appropriate expression of existing data and be able to clearly express his own opinion, this process will encourage students to think critically.

Concern over critical thinking skills, over the last several decades, many educators, employers, and organizations have questioned whether today’s graduates in the USA will be prepared to meet the demands of the 21st century workforce, which one of the skills that need is critical thinking [22]. Research that conducted by [23] provided evidence that scores on a critical thinking assessment can predict real-world outcomes. One of the major goals of education reform is increased critical thinking skills instruction, and there is evidence that the knowledge gained from critical thinking instruction does transfer to the real world. (Fong in Butler, 2012)

References


Need Assessment For Graduate Users Through Tracer Study on Lecturer Groups of Beauty Education Study Program Universitas Negeri Medan

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Abstract. The results of the tracer study on curriculum implementation carried out in 2011 obtained graduate competency results not link and match with stakeholders' needs and graduates' academic achievements (very high achievement index, but not in accordance with performance in the field). The purpose of this study was to develop the alumni of cosmetology education website. The population of this study were all alumni who were netted through the website and filled out questionnaires that had been developed previously, using the snowball method. This type of research is a Development research, which is developing the Makeup Cosmetology Alumni website, which starts from website product development, then is validated on the expert team, then individual trials and field trials are carried out. The instrument used is a questionnaire that is to capture alumni data, the presence of alumni, work, suitability of alumni works with competence, suitability of the curriculum with work, long working income, then the data is descriptive, to draw conclusions. The results of this study are the competence of graduates who still do not meet the criteria for the required competencies. Stakeholders where alumni work have not adjusted their graduates' competencies, there is still low information in the community in mastering competencies, in-come is not in accordance with alumni competencies. The conclusion of the above is to gather the existence of Makeup Arrangements alumni, the Cosmetology Study Alumni Program community is formed through a tracer study website, so that there is a forum for alumni and keep monitoring the presence of the Alumni.

Keywords: Tracer study, cosmetology education.

1 Introduction

Government policy through the decision of the Directorate of Higher Education, which states that universities must be able to prepare their graduates to compete in a competitive labor market or an imbalance between demand and supply, and the quality of human resources produced in an effort to explore information related to the transition from lecturing to the world of work while tracking alumni performance, a study called the tracer study was conducted.

In the ILO's presentation (2011) explained that tracer study has the following meanings: Tracer studies of take a retrospective look at the evolution of the situation of a sample of children already provided with or exposed to a specific intervention. It is an inquiry approach at a single point in time that generates data on already achieved impact. From this opinion, it is
explained that tracer study is a method for tracing information on a sample that has been given a particular intervention which in time brings about the desired impact.

The KKNI curriculum is a curriculum that is oriented towards quality improvement which includes attitude, skills and knowledge. The implementation of the new Higher Education Paradigm is a curriculum change from content-based to competence-based with the demands of changing times and labor market signals. This situation leads to the consequences of curriculum fees that are demanded by the stake-holder parties. This guideline must be followed up by reviewing and identifying the latest market needs that have a vision in the future so that out-put (graduates) receive an appropriate award on the job. Many efforts can be made in identifying market needs as a foundation in the curriculum content, one of which is by searching graduates to see the initial conditions. To trace the profile of market needs, one method can be done by tracking graduates to alumni.

Based on the alumni data base at the Cosmetology Education Study Program level only provides information about the graduate address data obtained at the time of completion of the study (graduation). Data collection and traceability of alumni has not been maximized so that the presence of alumni after completing the study cannot be tracked. Data on temporary alumni is only obtained through personal information that has not been well documented. The choice of graduate tracing that is in accordance with the needs of the labor market is best done to obtain information on the absorption capacity of graduates towards the labor market. The search is carried out to be able to improve the competence of graduates in competing in the world of work.

To see how far the Cosmetology Education Study Program graduates can benefit the community, in accordance with their main competencies, it is necessary to conduct a tracer study. This tracking study is important because after graduates enter the workforce, it is very difficult to find information about the existence of graduates. The number of graduates absorbed into the world of work is also difficult to know. The suitability of the field of work of graduates cannot be known, as well as the ability of graduates from the point of view of the stakeholders. At this point the search and data collection of alumni is important to do. Tracer study on the one hand is undoubtedly to be done as one of the study program accreditation databases, and becomes increasingly important in its role because it can provide various information to evaluate the relevance of higher education in this case Cosmetology Education Study Program with the world of work. Feedback from graduates and graduate users can be used as material for evaluation and improvement of the curriculum.

The tracer study process is expected to provide useful input for lecturers and administrators to improve performance, as well as information for the public in monitoring the world of higher education. From the search of alumni related data, it is known that during this time the Makeup Management Study Program has never conducted a tracer study structured with a methodology that can be accounted for academically. Tracer studies that have been conducted in preparation for the submission of accreditation / reaccreditation. As a result, the implementation tends to simply prepare data to meet the administrative requirements for accreditation. So, whatever the results, the implementation is not sustainable and difficult to aggregate at a higher level to improve the implementation of the study program. This research focuses on the issue of external success through alumni tracking of the Cosmetology Education Study Program. To answer the main problem, in this study a problem was formulated which was described as follows; 1) How to map the realm of work for Makeup Cosmetology alumni in a career? 2) What is the relevance of the competence of alumni to the needs and demands of the job? 3) What are the supporting factors and constraints of alumni in
getting a job? 4) What additional competencies should alumni have to be able to compete in the world of work?

Tracer study is a study whose main purpose is to obtain information about graduates who have worked and have not worked. In addition, tracer study aims to find out the results of education in the form of mastery and acquisition of graduate competencies that are applied in the world of work and the transition from the world of higher education to business and industry. Through this tracer study, education providers can find out how the implementation and quality of program services through the assessment of alumni. Through this, education providers are able to improve and improve the quality of their services.

Institutionally, in addition to obtaining important information in the form of alumni feedback as evaluation material to find out the relevance of higher education to employment, educational institutions are also billed by stakeholders about the real work of educating the nation's generation in the form of giving birth to academically qualified and elegant personalities. To carry out these noble ideals, educational institutions are required to continue to reorganize themselves and improve the quality of education services to the public. One of them is through the assessment of the study program performance by the National Higher Education Accreditation Board (BAN PT) and the preparation of the Self Evaluation report as the basis for organizational consolidation and the development of academic activity programs. One of the items of self-evaluation and content of accreditation forms is about the existence of graduates after leaving college. Tracer Study is a study conducted on college graduates related to the transition of higher education to the world of work. The target of the study are college graduates who are already working in an agency or entrepreneur or graduates who have not worked [7]. Tracer Study also provides valuable information from evaluating the results of education and training in certain agencies, thus tracer studies can provide a decision to plan future educational activities [8].

Tracer study of alumni is an empirical study that is expected to provide information to evaluate the results of education. This information is used for further development in ensuring the quality of education. With this tracer study activity, it is expected that will get information on indications of lack of implementation of study programs and provide the basics of future planning. For that information the success of professionalism (career, status, income) of alumni is needed. Similarly, information on relevant knowledge and expertise (the relationship between knowledge and expertise with work needs, scope of work, professional position).

Graduates search is an empirical research that can produce valuable information in evaluating an education program. Study information can be used as an effort to guarantee quality for the institution as a whole, in the sense that the institution continues to improve the program in accordance with input from the results of the graduates' search studies [2]. The relevance of graduate search studies on policy making in the field of curriculum and program development has long been known [3]. The study of graduates' searches plays a role in evaluating the curriculum of a learning program, showing the strengths and weaknesses of the program so as to produce fundamental improvement suggestions. The study can be the basis for seeing the relevance and effectiveness of the curriculum being taught in accordance with the needs of the job market, and how well the applicable curriculum can prepare alumni to deal with the demands of change in the work environment, as the study has been done by [4].

Because alumni have more independent ties with learning institutions, alumni have a more objective perception and perspective in evaluating the learning programs they have taken [5]. Thus, the opinion of alumni is very valuable information for the development of an institution. [6] proposed a new approach so that graduates' search studies could be used as a basis for program planning and future activities. In the study, in addition to information on the
relevance of knowledge and skills acquired by graduates with needs in the workplace, professional success of graduates such as career, employment status, and income is traced. In addition, the job satisfaction of graduates is also an important indicator of the success of a program, as well as the study conducted by [9].

2 Methodology

Tracer studies for graduates of the Cosmetology Education Study Program are carried out through surveys involving graduates and supervisors as sources of data. Given the spread of graduates covering almost all of North Sumatra, the distribution of questionnaires used in tracer studies is carried out via e-mail and correspondence with respondents through the Web Site. Through the website developed questionnaires are more effective and the return of questionnaires from both sources of information can be monitored properly.

The method used in this study is descriptive to obtain an overview of the Makeup Cosmetology graduates. To obtain research data, a survey method is used using a questionnaire as a data collection tool. Furthermore, this study used a cross sectional study with a time range of one shot with the type of cross-section data, namely data collected at the time of a selected sample. Respondents study tracing of Makeup Cosmetology alumni. This study uses quantitative methods. For quantitative methods, a survey was conducted on all Cosmetology Education graduates who graduated in 2011-2017 through a questionnaire that was netted through the website. The step of developing an application for the web is done using software development methods with the step of developing a Waterfall model application. The application built is expected to be able to fulfill the following matters: a) Revision of bio data (previous bio data has been taken from the data while being a student, then given revision facilities if there is a change in data), b) Fill out the questionnaire in the application according to each login, c) Questionnaires in the form of: main job data or entrepreneurial activities, work, positive and negative comments about work / business, the contribution of the study program in the current job, the competence of the alumni, the reason for taking the field of work/business, the most important aspects of following job selection process or starting a makeup business. In general, the implementation of this tracer study is carried out in three stages, as shown in Figure 1 below shows the details of the tracer activities shown in the flow chart below. Tracer studies for graduates of the Cosmetology Education Study Program are carried out through surveys involving graduates and supervisors as sources of data. Given the spread of graduates covering almost all of North Sumatra, the distribution of questionnaires used in tracer studies is carried out via e-mail and correspondence with respondents through the Web Site. Through the website developed questionnaires are more effective and the return of questionnaires from both sources of information can be monitored properly.

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![Flow Chart of Tracer Study](image)

The web-based tracer study system by utilizing information technology is used as part of the implementation of this Tracer Study, it is hoped that it will be more interesting and easier for both data collection and analysis. In the System, there needs to be features especially related to respondents, graduate years, current jobs, the amount of salary and the meaning of makeup knowledge with current work.

### 3 Result and Discussion

Based on the R & D procedure proposed by [10], the results achieved in the design of the tracer study program are as follows;

1. **Main page**
   
   The main page of the Makeup Tracer Study Education Study Program is the Home page. When accessing this website for the first time, the page that will appear is the Home page. This page contains a welcome slideshow on the Cosmetology Education study tracer and below the text is a button that directs to the tracer page. At the top of the display there is a logo on the left and navigation which consists of home, tracer, and about on the right side.

2. **Tracer page**
   
   The tracer page is the user's page for selecting the type of login user. There are three types of users in the Tracer Study Tracer Study of the Cosmetology Education Study Program, namely as alumni. On this page there is an explanation of the picture, the user types, and the login button for each user. On the tracer page, if the Tracer Study Program's Cosmetology
Study Program website user, presses the alumni login button, the user chooses to be an alumnus of the Cosmetology Education Study Program. After the user presses the alumni button, the alumni login page will appear containing the login form for the alumni. This page consists of a username box that uses the Student Identification Number as the username, and a password entry box to enter the alumni user page. After successfully entering the alumni page if the alumni have not filled in their personal data, the alumni profile form will appear. In the alumni profile form, there is a box of names, gender, address, telephone / mobile number, e-mail, class, year of graduation, work.

The questionnaire form will appear immediately after the alumni has logged in after filling in the personal data before or after the alumni has filled in their personal data. The questionnaire form is in the form of options ranging from 1 to 5. The type of data input type is in the HTML called the radio button. Using the radio button, you can only choose one answer for each problem. After the alumni answers all the questionnaires and presses the save button, the page will move to the page containing the text thank you for filling in the tracer study questionnaire. This page indicates that all data has been filled.

3.1 Profile of Graduates of Cosmetology Education

The graduate profile of the Cosmetology Education Study Program has a distinctive feature that distinguishes it from the profile of other skills education graduates. The profile is basically developed by each study program before the program is offered, even before developing the curriculum. Thus, before the opening of the program, the study program already has an overview of the graduate profile. In early 2016, the KKNI curriculum began to resonate again in the world of Higher Education in Indonesia. At the Higher Education level, Core Curriculum, the competency approach is officially applied. The core curriculum that previously applied nationally is not applied anymore because each curriculum is developed by each study program.

Competence can be defined in various ways as a set of smart actions, full of responsibilities that a person has as a condition to be considered capable by the community in carrying out tasks in a particular field of work. Based on this definition competence can be known for various fields, such as teacher competency, competence as medical personnel, agricultural extension workers, accountants, architects and so on. A person is considered competent in a particular field if he is able to show intelligent actions that are full of responsibility in the field, so he gets the trust of the community. Therefore, whether a person is competent or not in a particular job can be known through the opinions of the people served and of course the employer.

Smart and responsible action, which is a very complex decision-making action, based on various abilities, which in the Minister of National Education Decree No. 045 / U / 2002 referred to as the element of competence, which consists of: (1) foundation of personality, (2) mastery knowledge and skills, (3) ability to work, (4) attitude and behavior in working according to skill level based on knowledge and skills mastered, and (5) understanding the rules of community life in accordance with the choice of expertise in work.

The curriculum KKNI requires each graduate to master a set of competencies that have been developed before the curriculum is established. These competency devices are used as exit requirements or external requirements. That is, a student is declared a graduate of the program, if he has mastered the required competencies. Competency tools are developed by referring to the assumptions of the program's foundation, vision and mission of the Cosmetology Education Study Program, and the tasks/characteristics/demands of employment
presented by graduates. By looking at the profile of these graduates, prospective students can determine which competencies match their abilities and expectations.

Previous Study Tracer Results

A graduate tracer study was carried out by the Cosmetology Education Study Program Tracer Study Team in 2010. The study conducted by this Team is the initial stage of searching for a new Makeup Cosmetology Study Program Applicant. The results of the 2010 tracer study have not fully described the graduate profile. However, the number of questionnaires returned to the Tracer Study Team was 4 questionnaires (less representative). The four graduates have worked on the status and they claim to work in accordance with their expertise. Tracer studies graduates of the Cosmetology Education Study Program for 36 graduates from 259 graduates (graduates until 2009). The results of the study are as follows [11].

1. Graduates who are respondents are 36 respondents, consisting of 34 (93.3%) and 2 people (6.7%).
2. Reasons for studying in Cosmetology Education because of the affordable costs (94.4%), State Universities (69.4%), adequate academic services (16.7%), and according to job needs (16.7%).
3. Based on the experience of respondents during college, most respondents consider it to work well with aspects of knowledge, skills and attitudes.
4. In the aspect of competence, most respondents consider having increased competency after graduating from the Cosmetology Education Study Program, but their ability to write and speak foreign languages has not increased according to their expectations.
5. Most respondents were satisfied with the academic and administrative services provided by the Cosmetology Education Study Program, this case settlement service was still the last rank in the level of administrative service satisfaction.
6. In the aspect of competitiveness, Makeup Cosmetology graduates have qualities that are not inferior to other tertiary graduates.
7. Communication between Makeup Cosmetology alumni is still low due to ineffectiveness in the area.

From tracer study searches conducted from June to the end of October 2011 (four months) netted 30 Cosmetology Education alumni. After graduating from the student, the waiting period to get the first job is as shown in graph 1 below, stating that the highest percentage of 17 alumni (60.00%) stated that they have waited a long time to get a job for more than 1 year. The waiting time between 6-12 months is 32.22% (9 people) and only 7.78% (4 people) are the waiting time to get a job less than 6 months.

![Fig.1. Waiting Time to Get a Job](image-url)

In obtaining a job before graduation, the alumni stated that only 6 people (20%) who had worked before graduating were part-time jobs only as a home decorator who did not open a
salon, but could be called to make graduations, marriages and others, and the remaining 80% (24 people) said they had never worked.

In the question "What is your current job in accordance with the field of science that you have?" Around (73.3%) said that the work they got was in accordance with the field of knowledge they had, namely as honorary teachers at Vocational High Schools, opening their own businesses in accordance with their fields, namely opening salons and becoming bridal grooms, and only (26.7) said their work was not in accordance with the knowledge they gained, namely credit sellers, working at a private bank and in the company as a secretary.

In figure 4. It is unfortunate that there are no 0% of alumni participating in the alumni organization activities, this is likely to occur because the alumni organization in the Cosmetology Education Study Program has not been active and running properly, this has become a big whip for the Cosmetology Education Study Program immediately activating the organization that is actually an Alumni bond that has existed since 2013, but the reality in the field has not played a role to advance the Cosmetology Education Study Program.
The next question is how to participate when there are alumni organization activities? Considering that the alumni organization has not been active and is running well, all alumni answered that they were not active. Because the activities of the alumni organization have not been active so that all alumni (100%) state they are not active in the organization as shown in figure 5 below.

Next is the question whether there is a function of the alumni organization that you follow in fostering graduates? Because the existence of the Alumni organization is not yet active, so the answers of 100% respondents stated that they have not functioned in their duties to foster alumni, which should be the activities of alumni organizations to foster alumni to be efficient in the labor market.
In figure 7. It is seen that alumni who are always looking for information in getting jobs have 16.6% alumni who stated that they are actively seeking job information, while 56.6% are less active, and 26.6% say they are not active.

![Fig.7. Finding job information gets a job](image)

Regarding the alumni’s opinion on the job market information source activities, such as the government, entrepreneurs, the Government Industry and Private Industry for the guidance of graduates, as shown in figure 8 below, 55% of alumni said they were inactive and 33% uncertain. Those who play an active role in the job market information activities are only 0% and 13% less active. This is indicated that alumni do not feel that the job market can help them to find work, so they only seek work through friends or family.

![Fig.8. The opinion of alumni on the job market information source activities](image)

In Figure 9 the following is the first amount of salary received after work alumni answer getting the first salary of over one million, there are 53.3%, then 40% say they get the first salary between Rp. 600,000-Rp. 1,000,000, and only 6.7%, whose first salary is less than Rp. 600,000.
Next to the question where the agency works, alumni answered that only 2% said they worked for government agencies. The rest works for private institutions (98%).

Alumni Assessment of Organizing and Quality of Service Alumni assessment of service delivery and quality in the Cosmetology Education study program is seen from the alumni's perceptions of aspects: 1) administrative services, 2) aspects of learning, 3) study program facilities, and 4) learning experience. On aspects of administrative services that include service effectiveness, speed of file settlement, officer communication skills, and friendliness in service are good. In the aspect of the learning process which includes lecturer and student interaction, the learning process in the classroom, practicum and research writing are good. This is shown by the acquisition of quality achievement values of 69%.

Some alumni feel that the study program has provided convenience in administrative services and teaching and learning processes. In the learning aspect the acquisition of achievement scores of 69% alumni satisfaction perceptions in the good category, of course, would be better if improved. Whereas in the aspect of study program facilities alumni satisfaction scores reached 73%. Respondents felt that service quality was sufficient but needed an increase in terms of Human Resources (HR) and facilities and infrastructure so that quality could compete with other universities and the output of students could compete in the world. On the aspect of alumni's assessment of learning experiences outside, the achievement score of satisfaction perception quality was 72%. This shows that alumni learning experiences
obtained from activities during the study such as internships/industrial practices, industry visits, and student organizations activities are able to equip alumni in the workforce. Alumni also provide input to further improve career development and guidance, including through collaboration or building partnerships from other companies to start recruiting graduates of Cosmetology Education Study Programs so that graduates will find it easier to find work, not only as teachers but also as private employees in the company which can involve alumni who have been directly involved in the Business World and the Industrial World. The alumni’s assessment of the implementation and quality of services in the Cosmetology Education study program as a whole can be seen in the following table:

<table>
<thead>
<tr>
<th>Table 1. Table of Alumni Assessment of Quality of Study Program Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspect</td>
</tr>
<tr>
<td>Administrative Services</td>
</tr>
<tr>
<td>Learning</td>
</tr>
<tr>
<td>Facilities in the Study Program</td>
</tr>
<tr>
<td>Learning experience</td>
</tr>
</tbody>
</table>

Alumni User Appraisal of Graduates Competence User perceptions of the alumni competency in Cosmetology Education Study Program aside from the school and company respondents where alumni work. Aspects assessed include: 1) integrity, 2) professionalism, 3) use of language, 4) use of makeup electronics, 5) communication, 6) teamwork, and 7) self-development On aspects of workability, alumni users at school feel that the level of integrity, professionalism, communication, teamwork and self-development is very good. This shows that the alumni of the Cosmetology Education Study Program can apply the competencies obtained during the lecture and place the position where the alumni work.

Based on the perceptions of respondents in the company obtained a little deficiency that is expected to be an input for the Cosmetology Education Study Program, namely the use of language, especially English in the company still needs to be improved. Respondents also added that the alumni of the Cosmetology Education Study Program already had good morale and competence, but needed to improve their ability in speaking English because companies in the field of Cosmetology were very closely related to the international community. In addition, cooperation with other colleagues also needs to be improved. This is needed so that teams can transfer mutual knowledge.

Based on the general description it can be stated that graduates who were made respondents had relatively homogeneous conditions and characteristics, both from their gender, age and origin of their area. Whereas based on the number of graduates used as respondents, they showed a tendency toward increasing in their force when they entered as students. This fact is caused by the difficulty of obtaining communication with earlier graduate students (tracking respondents is easier for alumni who graduate later).

The lecture material reflected in the curriculum of the Cosmetology Education Study Program, according to the alumni, is still relevant to the demands of their field of expertise in employment, so it is well stated to support the field/material in the school. This proves that alumni have sufficient knowledge and skills that are synergized with the development of the curriculum in schools or other educational fields. Nevertheless the Education Planning Education program accommodates input in the form of suggestions from alumni related to the learning system and curriculum developed. Suggestions such as those that have been disclosed are certainly very useful for study programs to be recommended in curriculum development. Because the curriculum must always be developed so that it can fit and synergize with the demands of users and demands for the development of time (science and technology).
4 Conclusion

The conclusion of this tracer study activity is the collection of alumni data in the Cosmetology Education Study Program, where it is located, the absorption of graduates by the "market" (waiting period to get a job), first salary earned, employment, curriculum relevance with work, employment status and alumni response about the importance of mastering competencies: English, Computers, soft skills and entrepreneurship.

References

Abstract. Permit on Islet C and D has been issued and come up with new era of jakarta bay reclamation conflict. Conflicts that occur due to the construction of Jakarta bay reclamation are not new. The Jakarta Bay reclamation conflict has been going on for a long time. despite changing government, this conflict still occurs. The conflicts that occur are not only vertical conflicts between the government and the community and between the central government and the regions, but also horizontal conflicts between pro and contra communities, between institutions or ministries. This research is qualitative method with depth interview and literature review. The result of this research show that cause of conflict in Jakarta Bay Reclamation is political interest that also support by economical interest. The duration of this conflict shows that there are political and economic interests being sought. However, this interest actually forgets the purpose of development itself, namely welfare for the community. Seeing the impact of social change and economic losses that arise, it is necessary to look back on what interests are carried. In addition, good environmental management needs to be supported by strict policies and strict supervision.

Keywords: Conflict, Ecological Crisis, Jakarta Bay Reclamation, Political Interest.

1 Introduction

Jakarta new Governor, Anies Baswedan has issued permits (IMB) on Islet C and D, called Pantai Maju and Pantai Kita. It’s come up with conflict that happened before. Conflicts that occur due to the construction of Jakarta bay reclamation are not new. In the 1980s, reclamation carried out in Muara Baru had received strong criticism from Emil Salim, as the first Minister of State for Development and Environmental Monitoring in Indonesia, because it was deemed not to meet the environmental permit requirements. Not only at the level of government agencies, this conflict also occurs because of business competition between developers. At this time, the rejection of farmers in the region also emerged.

In 2003, the issue of Jakarta Bay reclamation returned to concern after the Ministry of Environment and Forestry (KLHK) in the Jakarta Bay reclamation had been seen in 2003 by issuing a Decree of the Ministry of Environment No. 14 of 2003 concerning the Inability to Plan the North Coast Jakarta Reclamation and Revitalization Activities. This decree is based on a study that shows that reclamation increases the risk of flooding, especially in the northern region, damaging marine ecosystems, causing fishermen's income to decline, and disrupting the Muara Karang power plant. This decision was sued by 6 developers who carried out reclamation until the Supreme Court issued a decision to win a lawsuit for 6 developers in 2011.
Permits issued during the government period, Fauzi Bowo and Basuki Tjahya Purnama, again raised strong opposition from the people who were members of the coalition to save the Jakarta bay. These permits were even sued because they were considered by the community to be of interest to the community by not doing socialization to the affected communities, especially the people who depend on Jakarta bay for their lives. In addition, the issuance of the permit was considered to be administrative and legal. Until then, the permit and rules for reclamation of the Jakarta bay are still one of the long debates.

The issue of Jakarta bay reclamation even became one of the issues that became the material for the Jakarta gubernatorial election campaign in 2017. Basuki Tjahya Purnama and Djarot Saiful Hidayat who agreed with the construction of the Jakarta bay reclamation. While his opponents, Anies Baswedan and Sandiaga Uno, refused the existence of the Jakarta bay reclamasi. At the same time, this issue became very political when different statements emerged in several ministries. Different attitudes, even debating authority in implementation and supervision, make many of the assumptions that emerge mainly the issue of political interests.

Different political interests make the Jakarta bay reclamation conflict not have a meeting point to date. The lack of clarity in the policy on the certainty of whether or not the construction of the Jakarta bay reclamation will not only disturb developers who have already issued large investments, but also the people affected like fishermen. The total value of potential losses from jakarta bay reclamation is Rp. 207,153,292,610, - / year [1]. In addition, there are changes in social activities caused by the inability of the community to adapt [2]. Not only humans, but environmental conditions will certainly have an impact. However, policies that are not in the same direction, and are uncertain, make environmental management and the handling of environmental impacts not yet addressed. Neglecting the economic valuation of environmental impacts is also neglected. Even if the amount is calculated to reach 1.4 trillion rupiah [3]. It means, ecological crisis will threaten the sustainability of the environment around the bay of Jakarta.

Some studies on the reclamation policy in Indonesia also carry the concept of sustainability as an indicator of development. The research that assess the sustainable development of Makassar beach reclamation with the Reclamation Sustainable Index (RSI). RSI uses 9 indices from three indicators of environmental factors, namely coastal resources, buildings and infrastructure [4]. The reclamation policy in Bali is considered not only damaging environmental sustainability but also causing social and cultural problems [5][6]. Although almost the same, this research will focus on the debate over the Jakarta bay reclamation policy. Does the policy not only pay attention to environmental sustainability, but also pay attention to social and economic issues.

2 Methodology
This research uses descriptive qualitative design that is to explain phenomena deductively and structurally which is the result of analysis of data and information obtained through in-depth interviews and discourse studies. In-depth interviews in this research used open-ended questions with interview guides attached in the appendix to this research. Discourse studies are the collection and search of data and information obtained through texts or documents such as official government press releases, news in print and online mass media, regulations or laws and articles. Informants in this study came from various sectors, from the central and regional governments, the coalition to save the Jakarta bay and also academics.

3 Results and Discussion

The government as the state organizer has authority in planning, implementing and supervising related to development involving national interests. This authority is reaffirmed in regulations either in the form of laws, regulations, decrees or other regulations. Jakarta Bay Reclamation which was formed through Presidential Decree No. 52 of 1995 concerning the Implementation of North Coast Jakarta Reclamation giving authority to the DKI Jakarta Provincial Government for planning, management and supervision. However, this authority must also coordinate with other institutions. For example, such as management rights (Hak Pengelolaan/HPL), the DKI Jakarta Provincial Government must obtain permission from the Ministry of Agrarian and Spatial Planning / Head of the National Land Agency. However, the issue of authority is overlapping when there are other regulations that also give authority "reclamation" to the Ministry of Maritime Affairs and Fisheries and also the Ministry of Transportation. This overlapping of authority will not be problematic if there are similarities in decisions, but in the case of the Jakarta Bay reclamation, this overlap in authority makes conflict.

If viewed from the regulatory side, the appointment of the Maritime Coordinating Minister is the coordinator of the Jakarta Bay reclamation joint committee which aims to resolve the conflict. So that the decision made or the cancellation of the Jakarta Bay reclamation should not be the authority of the Maritime Coordinating Ministry. Deeper, the results of in-depth interviews state that the results of the joint committee based on various studies conducted by committee members have been agreed. However, this agreement has never been an official decision because of the replacement of the Minister. The current status of the joint committee is only as a forum for coordination between institutions, but the final decision is in the hands of the Maritime Coordinating Ministry.

This shows that in a joint committee there is a power relation which is finally won by the interests of the group that wants reclamation to continue. Despite the regulation, the authority possessed by the Maritime Coordinating Ministry is not as strong as other institutions, but the existence of relations between actors who support the same interests makes the final decision in the hands of Minister Luhut Pandjaitan. Even though Rizal Ramli and Luhut institutionally have the same authority, the interests brought by Luhut Pandjaitan are stronger in relation. So, theoretically, there are several agreements even though there are also some differences in the concept of the authority of the Jakarta Bay reclamation.

Researchers agree with Afiff that changes in the environment, both in the context of the pollution that has occurred, efforts to improve or influence that will occur due to Jakarta Bay reclamation are the results of economic and political policies arising from the results of various actors in the context of a country and the interaction between countries, so that each actor cannot be seen as a monolithic and homogeneous group [7]. This means that struggles, resistance, and
conflicts including cooperation and alliances can be found to arise between individuals or groups both in each category of actors and between actors. This is what makes the complexity of planning and management in government policies [8] which ultimately can cause or deteriorate environmental conditions in the Jakarta Bay.

Secondly, the researchers agreed with the concept of power which was shown by Facoult that the concept of power or authority does not apply if it is only seen as a matter given by the state, but power is network, spread everywhere, so that power can be found in all areas of human interaction [9]. This is evident from if we look at the Jakarta Bay reclamation problem, the same authority is given by the state to the Maritime Coordinating Ministry, but the relationship that Luhut Pandjaitan has has more economic power than Rizal Ramli, so the policy taken by Luhut Pandjaitan has more influence rather than Rizal Ramli.

Third, although Foucault agrees with power relations, there are some things that are slightly different, namely power is considered as an individual's freedom of action, and is not influenced by anything [10]. However, this researcher found that the actions of actors who gain power are not entirely free based on their will, but there is one thing that influences the interests. The researcher found that power relations are formed by the same interests. So that how the policymaking actors position their knowledge and authority to gain interests, then it will influence the existing policies in government institutions.

The conflict in the Jakarta Bay Reclamation arose because there were differences in attitudes that were pointed out by the Central Government and the Regional Government. This conflict is included in resource use conflicts which often occur due to conflicting values and interests [11] or in this case the values and interests are manifested in the form of attitudes. The attitude or response of an institution with one another that is not as good as it can lead to conflict [12], but this is worsened by the belief that with the knowledge that is owned by each party is correct and authorized.

In other side, the involvement of "economical interest" also show up with given access to the collaboration of public private partnership (PPP), the concept of cooperation between the government and the private sector in implementing project development, is included in the funding. The omission of developer access that is too free can be caused by the existence of power relations with decision-making actors. This proves that power relations can shape the ability of access in the utilization and mastery of natural resources or profitable material [13], which are carried out exploitatively for economic growth activities [14]. Policy uncertainty, tugging on moratorium actions, violations of environmental permits and building permits, indicate that there are or no rights that developers have, developers feel they have what is called Ribot and Peluso as "bundle of power" [15]. forming access to resources. Where these developers have bundles and networks (webs) of power that allow developers to do things they shouldn't do. The relationship between politicians, bureaucrats and entrepreneurs raises a chain of power relations and interests that are difficult to break, and if this is included in an environmental policy, the researchers agree with Saragih, will worsen the ecological conditions of the earth [26]. This is because the policy taken will only benefit actors in power relations that are usually related to political economic interests. It is evident from the results of the interviews and policy analysis which shows that to date the Jakarta Bay reclamation is still controlled by developers.

The conflict that occurs is also inseparable from who is the authorized actor in the institution. Douglas calls these actors stakeholders, where there are social relations that lead to conflict [17]. These actors play an important role in any available decision making. In the Jakarta Bay reclamation policy, we can see changes in actors influence changes in attitudes and policies
and discourses that they form. This shows that in addition to seeing it as a conflict between institutions, this conflict also needs to be seen as a conflict between interested actors. Thus, research agrees with Bryant and Bailey that it is important to look at the role and influence of actors in conflict, because of the political interests and actions of actors who are political [18]. Each actor knows very well, knowledge of applicable regulations, overlapping authority, and also the effects of good or bad that can be generated. However, interest dominates the actor's attitude, which makes each actor position knowledge as desired in achieving his goals. Even than settling overlapping regulations and equating perceptions, often the actors involved in this conflict are looking for weaknesses in regulations, studies, and statements as a defense and blaming the conflicting parties.

4 Conclusions

The Jakarta Bay reclamation conflict has been going on for a long time. despite changing government, this conflict still occurs. The conflicts that occur are not only vertical conflicts between the government and the community and between the central government and the regions, but also horizontal conflicts between pro and contra communities, between institutions or ministries. The duration of this conflict shows that there are political and economic interests being sought. However, this interest actually forgets the purpose of development itself, namely welfare for the community. Seeing the impact of social change and economic losses that arise, it is necessary to look back on what interests are carried. In addition, good environmental management needs to be supported by strict policies and strict supervision.

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Life Cycle Cost Identification on Building Maintenance of Badan Pengelola Keuangan Daerah Pematangsiantar

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Abstract. Badan Pengelola Keuangan Daerah Pematangsiantar building has been established since 1981 and has been operating for more than 30 years. In order for the function of the building not to decrease during the life of the plan, routine maintenance is needed. However, maintenance carried out on the building so far has only been carried out in the events of damage or just as needed. Therefore, it is necessary to conduct a Life Cycle Cost study at Badan Pengelola Keuangan Daerah Pematangsiantar building to analyze the economic value of the building by considering the operating costs throughout the life of the plan. The purpose of this research is to make a long-term plan of Life Cycle Cost and to identify maintenance components of the building by making a financial schedule of maintenance costs over the life of the plan and to know the biggest maintenance costs. From the results of the research carried out, the total maintenance costs for the next 15 years amounted to Rp 2,052,491,356 which consisted of mechanical components maintenance amounted to Rp 386,534,267, electrical components amounted to Rp 1,078,841,811 and external spatial components amounted to Rp. 578,115,279. As well as the biggest maintenance costs on the maintenance of all components reviewed is the maintenance of electricity network with an average weight for the next 15 years of 29.86%.

Keywords: Building maintenance, financial schedule, life cycle cost, maintenance component

1 Introduction

Pematangsiantar City is the second largest city in North Sumatra Province. Pematangsiantar City is also has various characteristics of economic activities and consumption as a potential source of regional income. Therefore, the government of Pematangsiantar City built the Badan Pengelola Keuangan Daerah building in Pematangsiantar as the organizer of government affairs in the area of regional revenue in 1981 and has been operating for more than 30 years.

In order for the function of a building is not reduced throughout the life of the plan, there is a need for routine maintenance of buildings. However, maintenance of buildings so far has only been carried out if there is a damage that occurred or according to the required needs. With routine maintenance, the frequency of replacements and repairs will be increasingly frequent over the life of the building plan, resulting in high maintenance costs, then the overall costs of the project cycle will also be high [1].
To analyze the economic value of a building by considering maintenance costs throughout the life of the building plan, it is necessary to do studies of Life Cycle Cost [2]. The life cycle cost – LCC is the total cost of a building or its parts throughout its life, and it includes the costs of planning, design, operation, maintenance and disposal, less any residual value [3]. The purpose of the Life Cycle Cost is to manage life cycle costs (long-term) rather than short-term savings, to ensure a consistent service according to the purpose of designing a building, to increase sustainability and to reduce the risk of failure [4].

Based on the background above, it is necessary to do research by identifying the Life Cycle Cost on the components to be examined in the Badan Pengelola Keuangan Daerah building of Pematangsiantar by making a financial schedule of maintenance costs during the life of the plan. So that the results of this research will later provide an overview and input about Life Cycle Cost in the building to consider various alternatives and to find out the biggest maintenance cost during the life of the building plan.

The research purposes are as follows:

First, to calculate the long-term plan of Life Cycle Cost on the maintenance of the building for the next 15 years.

Second, to identify the maintenance components which its Life Cycle Cost to be calculated by making a financial schedule of maintenance costs and knowing the biggest maintenance costs during the life of the plan.

2 Methodology

Hidayat and Sedarmayanti suggested that research methodology is a discussion of theoretical concepts of various methods, advantages and disadvantages, which in the scientific work continued with the selection of the methods used [5]. The purpose of the existence of a research methodology is to direct the thinking process and work process to answer the problems that will be investigated further.

The research which its maintenance components to be reviewed is located in the Badan Pengelola Keuangan Daerah Pematangsiantar building at Jalan Merdeka No. 8, Pematangsiantar City.

2.1 Research Processes

The problem chosen as the topic of this research is to find the background, in this case the author chooses the Badan Pengelola Keuangan Daerah Pematangsiantar building.

After identifying the problem and determining the title of the research, the next thing to do is to determine the purpose of the research.

Literature studies in this research is needed to be done to find the data in the form of journals, books, and the internet that relate and support this research.

In this research, the data needed are: Primary data, direct interviews with respondents regarding main-tenance on the office building of Badan Pengelola Keuangan Daerah of Pematangsiantar, and Secondary Data, maintenance data of the building in 2013-2017 and inflation data in 2013-2017 based on Badan Pusat Statistik of Pematangsiantar City.

In analyzing the data in this research is by using Life Cycle Cost Analysis. The calculation of Life Cycle Cost Analysis in this research is based on the maintenance data of the building for the last 5 (five) years.
At the final stage, conclusions are made based on the data that has been analyzed which is directly related to the purposes of the research along with suggestions for further research.

2.2 **Preliminary Survey**
Survey is an activity to visit the object of the research directly to obtain important information related to this research.

2.3 **Data processing stage**
Maintenance components that will be reviewed are divided into 3 types of maintenance [6], which are:

a. Mechanical components. Included in the maintenance is: water network.

b. Electrical components. Included in the maintenance are: generatorset, electricity network and internet / computer network.

c. Outer spatial components. Included in the maintenance are: roof, fence and wooden listplank.

2.3.1 **Inflation**
Inflation is used to calculate the amount of building maintenance costs over the next 15 years. The amount of the inflation can be taken from Badan Pusat Statistik (BPS) of Pematangsiantar City for the last 5 (five) years. The next stage is to get the average of the inflation value for the last 5 (five) years with the formula:

\[
\text{Average} = \frac{\sum (\text{inflation 2013–2017})}{\text{amount of samples}}
\]

(1)

2.3.2 **Table of interest**
The interest table is used to get the value of the inflation factor. The table of interest used is taken from a book of compound interest tables.

2.3.3 **Calculating maintenance costs using the interest rate formula**
Calculating maintenance costs for 15 years is by using the single payment interest rate formula [7]:

\[
F = P (F/P, i\%, N)
\]

(2)

2.3.4 **Calculating the biggest maintenance cost**
Determining the biggest amount of maintenance cost by calculating the percentage of component maintenance costs each year with the formula [7]:

\[
\text{Average} = \frac{\sum (\text{maintenance costs 2018–2027})}{15}
\]

(3)

Then, to get the percentage of maintenance costs each year is by using the formula [7]:

\[
\text{Percentage} = \left( \frac{\text{components maintenance costs}}{\text{total of maintenance costs}} \right) \times 100\%
\]

(4)

3 **Result and Discussion**

3.1 **Identification of the Reviewed Building Components**
Mechanical Components. Included in the maintenance of mechanical components is:
Table 1. Maintenance Costs of Mechanical Components in 2013-2017

<table>
<thead>
<tr>
<th>Maintenance Cost</th>
<th>Water Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Rp 15.000.000</td>
</tr>
<tr>
<td>2014</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>Rp 15.000.000</td>
</tr>
<tr>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>Rp 17.000.000</td>
</tr>
</tbody>
</table>

Source: Kasubbag Data dan Program Badan Pengelolaan Keuangan Daerah Pematangsiantar

Electrical Components. Included in the maintenance of electrical components are:

Table 2. Maintenance Costs of Electrical Components of in 2013-2017

<table>
<thead>
<tr>
<th>Maintenance Cost</th>
<th>Generatorset</th>
<th>Electrical Network</th>
<th>Internet/Computer Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Rp 10.000.000</td>
<td></td>
<td>Rp 5.000.000</td>
</tr>
<tr>
<td>2014</td>
<td>Rp 12.300.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>Rp 12.000.000</td>
<td>Rp 20.000.000</td>
<td>Rp 10.000.000</td>
</tr>
<tr>
<td>2016</td>
<td>Rp 12.000.000</td>
<td>Rp 40.000.000</td>
<td>Rp 10.000.000</td>
</tr>
<tr>
<td>2017</td>
<td>Rp 14.000.000</td>
<td>Rp 35.000.000</td>
<td>Rp 12.000.000</td>
</tr>
</tbody>
</table>

Source: Kasubbag Data dan Program Badan Pengelolaan Keuangan Daerah Pematangsiantar

Outer Spatial Components. Included in the maintenance of outer spatial components are:

Table 3. Maintenance Costs of Outer Spatial Components in 2013-2017

<table>
<thead>
<tr>
<th>Maintenance Cost</th>
<th>Roof</th>
<th>Fence</th>
<th>Wooden Lisplank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Kasubbag Data dan Program Badan Pengelolaan Keuangan Daerah Pematangsiantar

3.2 Inflation

Cost estimation is calculated by the effect of inflation. Inflation data taken at Badan Pusat Statistik of Pematangsiantar City are as follows:

Table 4. Inflation of Pematangsiantar City

<table>
<thead>
<tr>
<th>Year</th>
<th>Inflation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>12.02</td>
</tr>
<tr>
<td>2014</td>
<td>7.94</td>
</tr>
<tr>
<td>2015</td>
<td>3.36</td>
</tr>
<tr>
<td>2016</td>
<td>4.76</td>
</tr>
<tr>
<td>2017</td>
<td>3.10</td>
</tr>
</tbody>
</table>

Source: Indeks Harga Konsumen dan Inflasi Kota Pematangsiantar
Next, to get the average inflation value for the last 5 (five) years is by using the formula:

\[
\bar{x} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}
\]  

(1)

which:

\( \bar{x} \) = Average

\( x_1, x_2, x_3 \) = Value of samples

\( n \) = Amount of samples

So that the average is obtained as follows:

\[
\bar{x} = \frac{12.02\%+7.94\%+3.36\%+4.76\%+3.10\%}{5}
\]

\( \bar{x} = 6 \% \)

Based on the calculation above, the inflation value to be used for the next 15 years is 6% and is assumed to be fixed. Then, to get the value of the inflation factor of 6% can be seen in the following table:

**Table 5. Factors of 6% Compound Interest**

<table>
<thead>
<tr>
<th>N</th>
<th>Factors of Number of Compound F/P</th>
<th>Factors of Present Value P/F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.0600</td>
<td>0.9434</td>
</tr>
<tr>
<td>2</td>
<td>1.1236</td>
<td>0.8900</td>
</tr>
<tr>
<td>3</td>
<td>1.1910</td>
<td>0.8396</td>
</tr>
<tr>
<td>4</td>
<td>1.2625</td>
<td>0.7921</td>
</tr>
<tr>
<td>5</td>
<td>1.3382</td>
<td>0.7434</td>
</tr>
<tr>
<td>6</td>
<td>1.4185</td>
<td>0.705</td>
</tr>
<tr>
<td>7</td>
<td>1.5036</td>
<td>0.6651</td>
</tr>
<tr>
<td>8</td>
<td>1.5938</td>
<td>0.6274</td>
</tr>
<tr>
<td>9</td>
<td>1.6895</td>
<td>0.5919</td>
</tr>
<tr>
<td>10</td>
<td>1.7908</td>
<td>0.5584</td>
</tr>
<tr>
<td>11</td>
<td>1.8983</td>
<td>0.5268</td>
</tr>
<tr>
<td>12</td>
<td>2.0122</td>
<td>0.4970</td>
</tr>
<tr>
<td>13</td>
<td>2.1329</td>
<td>0.4688</td>
</tr>
<tr>
<td>14</td>
<td>2.2609</td>
<td>0.4423</td>
</tr>
<tr>
<td>15</td>
<td>2.3966</td>
<td>0.4173</td>
</tr>
</tbody>
</table>


### 3.3 Maintenance Cost Estimation With the Effect of Inflation by Using Rate Interest Formula

The calculation of components maintenance costs estimation that will be calculated to the next 15 years, can use a single payment interest rate formula (looking for F if P is known) as follows [7]:

\[
F = P \times (\frac{F}{P}, i\%, N)
\]

(2)

### 3.4 Recapitulation of Maintenance Costs of Mechanical Components
For the recapitulation of maintenance costs of mechanical components, it will be shown in table 6 and figure 1.

<table>
<thead>
<tr>
<th>Maintenance</th>
<th>Water Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Rp 16,606,667</td>
</tr>
<tr>
<td>2019</td>
<td>Rp 17,603,067</td>
</tr>
<tr>
<td>2020</td>
<td>Rp 18,659,000</td>
</tr>
<tr>
<td>2021</td>
<td>Rp 19,779,167</td>
</tr>
<tr>
<td>2022</td>
<td>Rp 20,965,133</td>
</tr>
<tr>
<td>2023</td>
<td>Rp 22,223,167</td>
</tr>
<tr>
<td>2024</td>
<td>Rp 23,556,400</td>
</tr>
<tr>
<td>2025</td>
<td>Rp 24,969,533</td>
</tr>
<tr>
<td>2026</td>
<td>Rp 26,468,833</td>
</tr>
<tr>
<td>2027</td>
<td>Rp 28,055,867</td>
</tr>
<tr>
<td>2028</td>
<td>Rp 29,740,033</td>
</tr>
<tr>
<td>2029</td>
<td>Rp 31,524,467</td>
</tr>
<tr>
<td>2030</td>
<td>Rp 33,415,433</td>
</tr>
<tr>
<td>2031</td>
<td>Rp 35,420,767</td>
</tr>
<tr>
<td>2032</td>
<td>Rp 37,546,733</td>
</tr>
</tbody>
</table>

Fig.1. Graph Total of Maintenance Costs of Mechanical Components for 15 Years

3.5 Recapitulation of Maintenance Costs of Electrical Components

For the recapitulation of maintenance costs of electrical components, it will be shown in table figure 2
3.6 Recapitulation of Maintenance Costs of Outer Spatial Components

For the recapitulation of maintenance costs of outer spatial components, it will be shown in table 7 and figure 3 below.

**Table 7. Recapitulation of Maintenance Costs of Outer Spatial Components for 15 Years**

<table>
<thead>
<tr>
<th>Maintenance</th>
<th>Roof</th>
<th>Fence</th>
<th>Wooden Lisplank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Rp 20,824.732</td>
<td>Rp 2,140.870</td>
<td>Rp 17,683.852</td>
</tr>
<tr>
<td>2019</td>
<td>Rp 2,269.323</td>
<td>Rp 18,902.823</td>
<td>Rp 20,036.723</td>
</tr>
<tr>
<td>2020</td>
<td>Rp 2,405.450</td>
<td>Rp 21,239.599</td>
<td>Rp 23,453.123</td>
</tr>
<tr>
<td>2021</td>
<td>Rp 2,549.857</td>
<td>Rp 22,513.134</td>
<td>Rp 25,785.976</td>
</tr>
<tr>
<td>2022</td>
<td>Rp 26,291.224</td>
<td>Rp 23,864.057</td>
<td>Rp 28,128.947</td>
</tr>
<tr>
<td>2023</td>
<td>Rp 27,027.748</td>
<td>Rp 25,295.732</td>
<td>Rp 30,520.869</td>
</tr>
<tr>
<td>2024</td>
<td>Rp 28,649.292</td>
<td>Rp 26,813.207</td>
<td>Rp 32,943.512</td>
</tr>
<tr>
<td>2026</td>
<td>Rp 33,190.458</td>
<td>Rp 30,123.830</td>
<td>Rp 37,989.041</td>
</tr>
<tr>
<td>2027</td>
<td>Rp 34,122.658</td>
<td>Rp 31,935.946</td>
<td>Rp 40,512.347</td>
</tr>
<tr>
<td>2028</td>
<td>Rp 35,071.875</td>
<td>Rp 33,882.136</td>
<td>Rp 43,134.551</td>
</tr>
<tr>
<td>2029</td>
<td>Rp 36,834.041</td>
<td>Rp 35,882.726</td>
<td>Rp 45,755.931</td>
</tr>
<tr>
<td>2030</td>
<td>Rp 41,903.526</td>
<td>Rp 38,036.127</td>
<td>Rp 48,401.068</td>
</tr>
<tr>
<td>2031</td>
<td>Rp 43,566.315</td>
<td>Rp 40,319.068</td>
<td>Rp 51,094.512</td>
</tr>
<tr>
<td>2032</td>
<td>Rp 45,840.387</td>
<td>Rp 43,019.068</td>
<td>Rp 53,803.543</td>
</tr>
</tbody>
</table>

Fig.2. Graph Total of Maintenance Costs of Electrical Components for 15 Years

Fig.3. Graph Total of Maintenance Costs of Outer Spatial Components for 15 Years
### 3.7 Total of Maintenance Costs

For the recapitulation of the total of maintenance costs, it will be shown in Table 8 and Figure 4.

<table>
<thead>
<tr>
<th>Year</th>
<th>Mechanical</th>
<th>Electrical</th>
<th>Outer Spatial</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Rp 16,606,667</td>
<td>Rp 45,626,667</td>
<td>Rp 40,798,454</td>
</tr>
<tr>
<td>2019</td>
<td>Rp 17,603,067</td>
<td>Rp 48,364,267</td>
<td>Rp 21,172,145</td>
</tr>
<tr>
<td>2020</td>
<td>Rp 18,659,000</td>
<td>Rp 51,265,616</td>
<td>Rp 22,442,173</td>
</tr>
<tr>
<td>2021</td>
<td>Rp 19,779,167</td>
<td>Rp 54,342,627</td>
<td>Rp 23,789,457</td>
</tr>
<tr>
<td>2022</td>
<td>Rp 20,965,133</td>
<td>Rp 57,602,083</td>
<td>Rp 51,507,106</td>
</tr>
<tr>
<td>2023</td>
<td>Rp 22,223,167</td>
<td>Rp 61,057,859</td>
<td>Rp 26,728,986</td>
</tr>
<tr>
<td>2024</td>
<td>Rp 23,556,400</td>
<td>Rp 64,721,110</td>
<td>Rp 28,332,536</td>
</tr>
<tr>
<td>2025</td>
<td>Rp 24,969,533</td>
<td>Rp 68,603,749</td>
<td>Rp 30,032,187</td>
</tr>
<tr>
<td>2026</td>
<td>Rp 26,468,833</td>
<td>Rp 72,722,061</td>
<td>Rp 65,025,933</td>
</tr>
<tr>
<td>2027</td>
<td>Rp 28,055,867</td>
<td>Rp 77,084,037</td>
<td>Rp 33,744,284</td>
</tr>
<tr>
<td>2028</td>
<td>Rp 29,740,033</td>
<td>Rp 81,709,881</td>
<td>Rp 35,769,921</td>
</tr>
<tr>
<td>2029</td>
<td>Rp 31,524,467</td>
<td>Rp 86,613,165</td>
<td>Rp 37,916,154</td>
</tr>
<tr>
<td>2030</td>
<td>Rp 33,415,433</td>
<td>Rp 91,808,965</td>
<td>Rp 82,094,046</td>
</tr>
<tr>
<td>2031</td>
<td>Rp 35,420,767</td>
<td>Rp 97,317,941</td>
<td>Rp 42,602,442</td>
</tr>
<tr>
<td>2032</td>
<td>Rp 37,546,733</td>
<td>Rp 103,158,787</td>
<td>Rp 45,159,455</td>
</tr>
</tbody>
</table>

**Fig. 4.** Graph of the Total of Maintenance Costs for 15 Years

### 3.8 Graph of the Average of Maintenance Costs

To find the average maintenance cost every year, the following formula can be used:

\[
\text{Average} = \left( \frac{\sum (\text{maintenance costs 2018–2032})}{15} \right)
\]

Then, to find the percentage of maintenance costs every year, the following formula is used:

\[
\text{Percentage} = \left( \frac{\text{components maintenance costs}}{\text{total of maintenance costs}} \right) \times 100\%
\]

Based on the formula above, the results of the average maintenance costs of all components are reviewed in the following table:
Table 9. The average maintenance costs of all components for 15 years

<table>
<thead>
<tr>
<th>Maintenance</th>
<th>Maintenance Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Network</td>
<td>Rp 25,768,951</td>
</tr>
<tr>
<td>Generatorset</td>
<td>Rp 19,836,610</td>
</tr>
<tr>
<td>Electrical Network</td>
<td>Rp 52,086,178</td>
</tr>
<tr>
<td>Internet/Computer Network</td>
<td>Rp 15,214,647</td>
</tr>
<tr>
<td>Roof</td>
<td>Rp 30,552,485</td>
</tr>
<tr>
<td>Fence</td>
<td>Rp 3,322,038</td>
</tr>
<tr>
<td>Wooden Listplank</td>
<td>Rp 27,671,651</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Rp 174,452,559</strong></td>
</tr>
</tbody>
</table>

Fig.5. Graph of the Average of Maintenance Costs of All Components for 15 Years

Based on Figure 3.5 above, it can be concluded that the highest cost of maintenance on the maintenance of all reviewed components is in the maintenance of electricity network with an average weight of 29.86% for the next 15 years.

4 Conclusion

From the results of the discussion, the amount of maintenance costs based on financial schedule for the next 15 years can be summarized as follows:

a. the total cost of the building maintenance is Rp. 2,052,491,356 and it is expected that an increase in maintenance costs will not be constant due to differences in maintenance cycle time for each components.

b. the maintenance of mechanical components is Rp. 386,534,267 and it is estimated that there will be an increase in maintenance costs every year.

c. the maintenance of electrical components is Rp 1,078,841,811 and it is estimated that there will be an increase in maintenance costs every year.

d. the maintenance of the outer spatial components is Rp. 578,115,279 and it is estimated that there will be an increase in maintenance costs every 4 years.

e. the biggest maintenance costs on the maintenance of all reviewed components is in electricity network maintenance with an average weight of 29.86% for the next 15 years.
References


Development of A "Product Design" Guidelines Book Based on Indonesia National Curriculum Framework (KKNI) to Develop Creative Industries Students of Education Department of Family Welfare State University of Medan

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{fingtyas@gmail.com}

Universitas Negeri Medan, Medan, Indonesia

Abstract. Product Design is a new subject that is compulsory in the Department of Family Welfare Education, so that all of these courses must be in the Fashion Design Education Study Program, Catering Education, Cosmetology and Nutrition Education. The discussion of a quality learning process in accordance with the curriculum is conducted intensively, but the reality in the field shows that there are not many lecturers who want to practice when conducting lectures. Students view the material as too theoretical, giving no contextual examples. Creative learning has a strategic position in developing student competencies, both technical competence (hard competence) and entrepreneurial skills (soft-competence). This study aims to develop a product design learning tool to enhance the creative industry, including, Product Design Guidebook, Semester Program Design, teaching materials, learning methods, and evaluation of learning outcomes, which can develop creative industries. Learning material needs to be designed by focusing on joint exhibition activities (creating or creating products both goods and services in accordance with the study program) that emphasize character, assignment or project-work learning methods, and evaluation of learning outcomes need to apply performance evaluation techniques by emphasizing evaluation processes and products. This research is a development research, with the instruments used are questionnaires and interviews. Data were analyzed using qualitative descriptive analysis techniques and quantitative descriptive statistical analysis. The results of this study is, that the existence of a product design guide book on the family welfare education department that is validated and suitable for student use. It is expected that there will be a Product Design Guidebook to improve the creative industry which is measured from the effectiveness of the experts and validators of learning design, so that the character of the student creative industry.

Keywords: Development of learning tools, product design, creative industry

1 Introduction

In the process of implementing learning in the Family Welfare Education Department, it is known that innovation and creative learning. This learning contains a set of courses that specifically aim to equip students to have productive competencies through the learning of
Product Design, in accordance with the Indonesian National Qualification Curriculum. The strategic position of learning to improve the creative industry is basically a benchmark that should be a reference for quality in the implementation of the Family Welfare Education Department. However, in reality it has not been used optimally, especially for the development of the character and entrepreneurial spirit in developing the creative industries that the government is currently proclaiming. Creating a design that solves problems certainly requires a brilliant idea so that the problem is solved and finds a creative concept. The process of finding the idea requires a joint discussion phase with each other randomly devoting ideas and opinions called brainstorming. This process is very important because this is where ideas become increasingly explored from various perspectives. In the design method, there are two methods of designing products namely creative methods and rational methods. The design method aims to help stimulate creative thinking by increasing the production of ideas, removing mental barriers to creativity or by expanding the solution search area. While the rational method emphasizes a systematic approach to design.

Learning from the large number of graduate graduates who are not absorbed in employment, if linked to limited employment, while the number of graduates is increasing sharply every year, the development of an entrepreneurial mental attitude has strategic value. This is because the development of character and entrepreneurial spirit means that the organization in the Family Welfare Education Department is not only focused on preparing graduates to become business/industrial world workers, but also focusing on the formation of entrepreneurial character to improve the creative industry. The need for the development of entrepreneurial character is actually in line with the results of research at Harvard University in the United States, which states that one's success is not determined solely by knowledge and technical skills (hard skills), but rather by the ability to manage themselves and others (soft-skill). This study reveals, a person's success is only determined around 20% by hard skills and the remaining 80% by soft skills (Ministry of National Education, 2010).

Developing a Product Design course is a course in the Department of Family Welfare Education in the IQF curriculum, especially requiring the right approach in developing creative industries, both classrooms learning and practice. Actually, the development of teaching materials, learning methods, and learning outcomes assessment system in this Product Design course focuses on referring to character indicators on creative learning which basically can develop and shape the competencies and characters of students of the Family Welfare Education Department.

Inter-sectorial collaboration between product design and various related sciences (engineering, humanities, science, business and management) is the main prerequisite for equipping reliable product design experts. For this reason learning in product design courses must anticipate this challenge by producing graduates who: Have the knowledge, skills and knowledge about designing creative industrial products that are in line with the latest information about the household industry; Having high creative power in solving design and innovation problems, through mastering the basic principles of technology, science and visual elements; Able to carry out product research and development through various multidisciplinary methods and approaches and cooperate well in a design team; Able to conduct reviews and analysis through various aspects (technology, humanities, social, and culture) on the development of industrial product design both nationally and internationally; Having the ability to present and communicate ideas, processes, design results, and evaluations in a clear, systematic and effective manner.

Designing the same as this design word seems not to be able to interpret the design more broadly, the word "Design" from the word design (English) is retained. A good design only on
paper only falls just as a concept culture. Because however good design is a design that meets the needs of the community. Besides that the acceptance of the community to a design must be critical, because without these elements there is no healthy growth of design. With that understanding, it provides an illustration that design is not solely owned by one of the disciplines, but belongs to all disciplines, because basically design is a cross-field between art, science and technology. Based on the background description in the introduction, the formulation of the problem of this research is: How is the development of learning equipment for packaged Product Design to develop Creative Industries for Student Family Welfare Education Department?

Product design is a field of design expertise that studies and plans for disposable objects, which are manufactured industrially. The scope of the expertise is broad, ranging from simple items such as household appliances, furniture, props, and children's toys, to modern high-tech equipment such as equipment, transportation, household equipment. Product design emphasizes its main concern on the relationship between humans as users and products as objects of use. The emphasis is on reciprocal relationships that involve consideration that includes technical, functional, psychological and market aspects. The design of a product requires adequate insight into materials, production processes, human behavior and social, cultural and economic demands. A product besides being demanded not only has technical, economic or just physical needs, but is also expected to answer the demands of symbolic functions, beauty, comfort and beauty.

Product design consists of two words namely design and product according to the large Indonesian dictionary, design means the form or design framework. While the product means the goods or services that are made and added to the use or the value is then processed into the final production process. So the understanding of product design is one of the activities that design a form and then processed through the production process and the end result becomes a product that is produced from the production process and its value and usefulness can meet consumer desires that are adapted to changing times and times. Product design is a profession whose activities are related to a process of technological innovation. Product design is the process of creating new products sold by the company for its customers. A very broad concept, basically the generation and development of effective and efficient ideas through processes that lead to new products. In a systematic approach, product designers conceptualize and evaluate ideas, and turn them into real discoveries of products. The role of designer products is to combine art, science and technology to create new products that can be used by others.

The term "Industrial Product Design" or "Industrial Design" first appeared in the early 20th century as a description of the creative preliminary process of mass-produced goods. To overcome the complexities of a mass production process, product designers need to carry out product usability tests to ensure that a product can meet the needs, desires, and expectations of its users, and often they rearrange its components or parts to make products more efficient to be manufactured and easy to assemble, repair and recycle.

2 Methodology

The design applied in this research is research and development [1]. This research was at the Department of Education for Family Welfare, with research subjects, namely the fields of food, clothing, makeup and nutrition. One skill competency is taken to develop learning tools
namely Guidebook, Semester Learning Plan, teaching material, learning method, and evaluation system with reference to indicators based on the creative industry. Preliminary studies were carried out using questionnaire techniques and literature review, namely the distribution of questionnaires to students. At the development stage used Focus group discussion techniques, with data collection techniques. Data collection instruments used in this study are: questionnaires used to collect data at the preliminary study and development stages; questionnaire (rating scale) is used to assess the results of the application of population design courses based on the creative industry.

The instruments used in this study were: questionnaire sheets for the needs of lecturers and students; questionnaire sheets for material experts; used to obtain data on the quality of product design materials and the development of learning delivery systems; questionnaire sheets for learning design experts; used to obtain data about the quality of learning and technical design of the product, Semester Learning Plan and joshed by learning design experts; observation sheet; which is used to obtain data about product design learning.

3 Result and Discussion

The process of developing a Learning Guidebook Product design is done in stages, which is done is to do a needs analysis and data collection. The activity was carried out to obtain data on the teaching and learning process, characteristics and learning needs of students, problems that existed in learning and developing guidebooks during the learning process. The needs analysis phase consists of an analysis of lecturer needs and an analysis of student needs.

The results of the questionnaire for lecturers' needs (99%) stated that the Product Design Learning manual was not available, so that it needed the development of learning manuals in an effort to improve more effective and interesting learning. The results of the questionnaire for student needs (48%) stated strongly agree and (52%) agreed if there was a product design guidebook. Expert validation is carried out by competent experts, consisting of two lecturers who are experts in the field of learning media. Media experts validate products on aspects of book appearance, efficiency, and technical quality, program effectiveness.

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Score (%)</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conformity with student character</td>
<td>83</td>
<td>Well</td>
</tr>
<tr>
<td>2</td>
<td>Use of good and correct Indonesian</td>
<td>99</td>
<td>Good luck</td>
</tr>
<tr>
<td>3</td>
<td>The language used is easily understood by students</td>
<td>90</td>
<td>Good luck</td>
</tr>
<tr>
<td>4</td>
<td>withdrawal of guidebooks</td>
<td>82.3</td>
<td>Well</td>
</tr>
<tr>
<td>5</td>
<td>suitability of the image</td>
<td>80</td>
<td>Well</td>
</tr>
<tr>
<td>6</td>
<td>the attractiveness of the color of the book</td>
<td>84</td>
<td>Well</td>
</tr>
<tr>
<td>7</td>
<td>Clarity of text in the book</td>
<td>90.5</td>
<td>Good luck</td>
</tr>
</tbody>
</table>

Average 85.6 Good luck

Based on the results of the media expert's validation, it was seen the display aspect of the Guidance namely suitability to student character (83%), good and correct use of Indonesian (99%), easy language understood by students (90%), book design attractiveness (82.3 %),
Suitability of the image (80%), color composition (84%), text clarity (90.5%), overall average for the aspect of the guidebook display is (85.6%).

<p>| Table 2. Scoring scores by Media Experts Aspects of Efficiency |
|---------------------------------|----------|----------|</p>
<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Score (%)</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Workbook guidelines</td>
<td>92</td>
<td>Very Good</td>
</tr>
<tr>
<td>2</td>
<td>Ease of Use of the Guidebook</td>
<td>92.5</td>
<td>Very Good</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>92.25</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

Based on the results of expert validation in table 2, the efficiency aspects for the score manual workflow (92%), ease of use of the guidebook (92.5%) were seen. Overall the average score on the efficiency aspect (92.25%).

<p>| Table 3. Scoring scores by Media Experts Aspects of Technical Quality, Effectiveness of the Guidebook |
|---------------------------------|----------|----------|</p>
<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Score (%)</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clarity and accuracy of the contents of the book</td>
<td>91</td>
<td>Very Good</td>
</tr>
<tr>
<td>2</td>
<td>Book Writing is not boring</td>
<td>82</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>Accuracy of evaluation</td>
<td>90.3</td>
<td>Very Good</td>
</tr>
<tr>
<td>4</td>
<td>The marginalization of the Guidebook</td>
<td>81.2</td>
<td>Good</td>
</tr>
<tr>
<td>5</td>
<td>Innovative presentation of material</td>
<td>90</td>
<td>Very Good</td>
</tr>
<tr>
<td>6</td>
<td>The overall creativity of the Book</td>
<td>89</td>
<td>Very Good</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>86.3</td>
<td>Good</td>
</tr>
</tbody>
</table>

The results of media expert validation showed aspects of technical quality, effectiveness, clarity and attractiveness of the guidebook (91%), open display was not boring (82%), accuracy of evaluation (90.3%), manual guidebook (81.2%) in criteria good, display of book content (89%), and innovative presentation of material (90%) Overall the average number of scores on aspects of technical quality, program effectiveness is 86.3% in very good criteria.

<p>| Table 4. Level of Trends in the Assessment of Media Experts on Aspects of Book Display | |
|---------------------------------|----------|----------|----------|</p>
<table>
<thead>
<tr>
<th>No</th>
<th>Criteria</th>
<th>Interval</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Good</td>
<td>85% ≤ skor ≤ 100%</td>
<td>5</td>
<td>27.78%</td>
</tr>
<tr>
<td>2</td>
<td>Very</td>
<td>69% ≤ skor ≤ 84%</td>
<td>13</td>
<td>72.22%</td>
</tr>
<tr>
<td>3</td>
<td>Pretty good</td>
<td>53% ≤ skor ≤ 68%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>4</td>
<td>Not good</td>
<td>37% ≤ skor ≤ 52%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>5</td>
<td>Not very good</td>
<td>20% ≤ skor ≤ 36%</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Based on the observations of the results of media experts in table 4, it can be seen from the manual guidelines for the level of tendency (27.78%) and (72.22%) good.

<p>| Table 5. Comments and Suggestions for Improvement from Media Experts |
|-----------------------------|---------------|</p>
<table>
<thead>
<tr>
<th>Media Expert</th>
<th>Comments and Suggestions</th>
</tr>
</thead>
</table>
Media Expert

Comments and Suggestions

Media Expert

I

Improved book cover design
Add a look to the design cover book of the study program
The color composition of the cover must be considered to be balanced
Add interesting pictures in the contents of the book

Media Expert

II

is already well used in learning Product Design
The content display is adjusted material and image so that the material
flow can be easily understood.
The text in the guidebook must also be adapted to the guidelines for
writing a good manual.

Validation of material experts on the development of the Product Design Guidebook carried out by material experts conducted for information was used to find out the shortcomings and feasibility of the material.

| Table 6. Score Assessment by Material Experts on Educational Aspects |
| --- | --- | --- |
| No | Indicator | Score (%) | Criteria |
| 1 | Compatibility of material with the curriculum | 98 | Very Good |
| 2 | The accuracy of the material with the syllabus | 98 | Very Good |
| 3 | The accuracy of the material with the Semester Learning Design | 99 | Very Good |
| 4 | Compatibility of material with competence | 90 | Very Good |
| 5 | Conformity of the material with the aim of learning | 97 | Very Good |
| Average | 97 | Very Good |

Based on the results of material expert validation on aspects of material accuracy, namely material integrity (90%), material presentation flow (91%), material determination with preliminary activities (98%), material accuracy with core activities (92%), material provisions with closing activities (91%), appropriateness of evaluation with material (92%). Overall the average aspect of material accuracy is (96.7%).

| Table 7. Evaluation of responses to the development of the Product Design Handbook on product testing aspects of attractiveness |
| --- | --- | --- | --- |
| No | Indicator | Score | Average (%) | Criteria |
| 1 | With this, a guidebook increases the interest in learning Product Design | 36 | 72 | Agree |
| 2 | The material presented in the form of a Guidebook adds motivation to learning | 38 | 76 | Agree |
| 3 | With the Guide Book can focus on learning Product Design | 39 | 78 | Agree |
| Average | 75,3 | Agree |

The results of the analysis by material experts in each aspect of the overall assessment are determined by the scores in each category. The results of the study were analyzed to determine whether or not the development of a Product Design Handbook is feasible.
Table 8. Results of the average percentage assessment of the development of the Guidebook by media experts

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Average (%)</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aspect of Book Display</td>
<td>85.6</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Efficiency Aspect</td>
<td>88</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>Technical Quality Aspects, Effectiveness of the Guide book</td>
<td>86.3</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>86.63</strong></td>
<td><strong>Good</strong></td>
</tr>
</tbody>
</table>

Media experts assess the development of the Product Design Guidebook based on three aspects, namely the aspect of book display (85.6%), efficiency aspects (88%), and aspects of technical quality, book effectiveness (86.3%).

Media experts assess the development of the Product Design Guidebook based on the above three aspects, namely the education aspect (98.0%), the material accuracy aspect (96.7%). The results of the material expert research percentage can be seen in Figure 1 below.

![Fig.1. Development of a Guide to Product Design courses by Material Experts.](image)

The results of the analysis of product trial data in each aspect of the overall assessment are determined from the average score in each category. The results of the assessment are then analyzed to determine the shortcomings of the Product Design Handbook. The average results of the percentage assessment of student product trial responses are based on four aspects, namely aspects of attractiveness (75.3%), aspects of difficulty (71%), aspects of appearance (74%), and aspects of benefits (76%). Overall in the criteria (74%) the percentage of product trials can be seen in Figure 2 below.

![Fig.2. Scoring Guide Book Development Product trial product design.](image)
The results of the evaluation of the development of the Product Design Guidebook indicate that the products developed are in good criteria and can be continued in use / field trials. The results of the trial data analysis use in each aspect of the overall assessment determined from the average score in each category. The results of the assessment are then analyzed to determine the shortcomings of the Product Design Handbook.

The results of the average evaluation of the trial responses using students while attending Product Design learning are based on four aspects, namely aspects of attractiveness (91.7%), aspects of difficulty (89%), aspects of appearance (91.3%), and aspects of benefits (91.4%).

The results of the evaluation of the development of the Product Design Handbook in general, the value of responses from students was considered very Agreeable so that no revisions were made, this can be seen from the product trials and usage trials experiencing an increase in student responses below.

The results of data analysis on effectiveness tests were conducted to find out which Guidebook products were made feasible or not used as learning media. Effectiveness test is carried out on students who take part in learning Product Design. Analysis of student effectiveness test data. Based on the results of data analysis evaluating media experts, material experts, researchers conducted several revisions to the learning manual product.

Table 9. Comments and Suggestions for Improvement from Material Experts
At the stage of identifying potential and problems, a needs analysis is conducted to Product Design lecturers by giving questionnaires and observations to product Design lecturers to find out about Product Design learning, the curriculum used in Product Design. The development stage then designed the Product Design guidebook. Before the guidebook is complete, the pre-production stage is carried out to draw up an outline of the learning program and the contents of the material through a flow diagram. The development of guidebooks plays a role in determining the title, purpose and points of the learning material. The principle of psychology in making Guidebooks is content organizations [2]. So in the development of the guidebook it is organized and organized in several sequences as outlined in the flowchart, the sequence of presentation of learning material starts from the Standards of competence, basic competencies, indicators, objectives, and material of Product Design.

Based on the results of the data analysis carried out, it was stated that the Product Design Handbook was in a good classification, meaning that it was worth using for the learning guide. The feasibility referred to is the manual book product that has fulfilled the characteristics, namely Self Instructional or independent learning, (Susilana and Riyana, 2009), in fulfilling the Self Instruction character, the indicator guidebook products are as follows: There is competence to clarify the objectives of the learning material given; Presentation of learning material made in stages into activity units, making it easier for students to learn independently; Presentation of Product Design material packaged in books with narratives to support the clarity of presentation of learning material; Product Design Materials given is related to the everyday student environment; Using communicative and simple language so that it is easily understood by all groups.

The field developed in Product Design is closely related to human resources as a key factor in the creative industry, so the aspect that directly needs attention is the learning process. Improvement of development is a change in the learning device. It should also be realized that higher education institutions are one of their visions and missions as agents of change (agents of change), their realization can be measured from the outputs produced, namely the results of creativity and productivity.

Improving the skills of students who are based on local potential, students need to be trained continuously, the main competencies taught are not only skills but more importantly are student soft skills to develop creativity. In accordance with the opinion of Victorino (2004), the general characteristics of local potential are: existing in the environment of a community; the community feels ownership; unite with nature; has a universal nature; practical; easy to understand using common sense; represents inheritance down and down. From the beginning the lecturer entered the class, repeating the learning material, giving apperception in the form of giving motivation to the students to look calm and pay close attention. There are no students who are busy themselves, students have been able to move well in learning. This is in agreement with Bamberger and Tal saying that learning outside the classroom as an effort to create interesting learning and become an alternative choice to avoid boredom and boredom [3].
With the preparation of the product design guidebook, it is expected that student creativity in designing skill products by utilizing local potential is achieved well. The development of a Learning Guidebook is directed at adding insight and knowledge about the superiority of regions that have environment. The learning process of Product Design is in the form of attitudes, knowledge, skills and creativity of regional superior products that will be developed by students.

Learning applies an increase in student attitudes, especially in instilling the character and development of the student culture itself. According to Mason (in Timpe, 1992) states that creativity that has sensitivity to problems, is full of original ideas and has flexibility in solving problems. John Baer (2011) states that creativity can train students to be able to solve problems independently.

Indirectly train students to have a brave attitude in facing the new world, train to communicate with others well, develop talents that exist in students, and bring new creative ideas. Opinion of Fasco D. Jr. that education and creativity are closely related, can develop knowledge and learning models to train students to think creatively, the emergence of creativity is influenced by intrinsic factors and extrinsic factors [4]. Seeing the many advantages gained from product design learning from the opinions above concluded that the existence of a learning manual better optimizes student learning resources. The results of this study are in line with the opinion of Horng (2005) arguing that the teaching strategies of creativity abilities that are guided by guidebooks are proven to be successful in increasing student creativity, among others: (1) student-centered learning, (2) use of various learning aids, (3) management good class, (4) linking the content of teaching with real life contexts, (5) using open questions and encouraging students to increase creativity [5].

4 Conclusion

The results of the average evaluation of the trial responses using students while attending Product Design learning are based on four aspects, namely aspects of attractiveness (91.7%), aspects of difficulty (89%), aspects of appearance (91.3%), and aspects of benefits (91.4%). The results of data analysis on the effectiveness test conducted to find out the Guidebook products that are made worthy of being used as learning media. The effectiveness test was carried out on students who participated in Product Design learning for small classes (74%) and in large group trials (90.9%) the effectiveness test data of students. Based on the results of data analysis evaluating media experts, material experts, researchers conducted several revisions to the learning manual products which basically lead to intellectuality, ideas and originality of human resource ideas derived from a combination of thought and creativity in designing, and producing. Advice and infrastructure support as an inseparable part of learning activities requires learning approaches and methods. Thus the creativity of students will not be shackled in a boring routine, even must be fostered and developed to achieve optimal, professional, and have benefits for the wider community including creative industries that can be realized in the Tri Dharma College program.

References


Effect of Transformational Leadership and Characteristics of Working Group on Educator Work Satisfaction (Study at Huria Kristen Batak Protestan (HKBP) Private High School in North Sumatera)

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Abstract. This study aims to determine the effect of transformational leadership and work group characteristics on the job satisfaction of educators in HKBP Private High Schools in North Sumatra Province. The population of this study was all full-time educators at HKBP Private High School with a sample of 131 taken by proportional random sampling technique. The research data was collected through questionnaires and analyzed with path analysis techniques. The results of the study showed that transformational leadership and the characteristics of the working group had a significant effect on the job satisfaction of educators. Conclusion, the more effective the transformational leadership of the principal is the higher job satisfaction, and the higher the support characteristics of the working group the higher the job satisfaction of the educator. The implication of the results of this study explains that to improve educator job satisfaction can be done by increasing the effectiveness of the principal's transformational leadership and the development of the characteristics of educator working groups..

Keywords: Transformational leadership, characteristics of working groups, job satisfaction.

1 Introduction

Educators as human resources in schools have a central position in order to achieve the vision, mission, and goals of the school. Educators are the key factor in the implementation of education in schools. Educators are the leading executors who cannot be replaced by technology even in the teaching and learning process in the classroom. Educators as human resources are most important inputs needed for the ongoing process of education in schools [1]. Educators play a strategic role, especially in the effort to shape the character of the nation through the development of desirable personalities and values [2]. The sophistication or technological advances that exist in schools cannot be used to shape the character of the nation but must still be in the hands of humans, namely educators.

A symptom that can make damage to the condition of the private school organization is the low job satisfaction of educators which results in dissatisfaction phenomena such as the desire to change jobs, absenteeism, being late, opposing leadership policies, refusing suggestions, high turnover, complaining, low quality of teaching, want to stop working, or working at another school. The existence of educators in schools must be seen as the highest capital of school organizations that have the potential, competence, attitudes and behavior that can be transformed into positive attitude towards their work so that they can gladly make a large contribution to school development and progress in the future. Those dissatisfactions seem to occur in schools run by the HKBP foundation which both quantity and quality dropped drastically. In the 1970s the number of schools managed by HKBP was 150 units [2] while in 2012 only 83 units from kindergarten to tertiary level [3], especially high schools also experienced a decline in the number of 17 units in 2012 to 14 units in 2013 [4].

Principals as leaders in school management need to pay attention to the psychological condition of educators so that they remain motivated and eager to succeed in achieving school organization goals. Growing and maintaining educator satisfaction towards their work is an important task that must be considered and realized by the school management so that it can have a positive impact on their work behavior in school. An educator who is satisfied with his job will tend to like and give the best and will even strive to meet the needs
of the subjects/objects he loves and is willing to sacrifice [4], the quality of the organization (school) is increasing, educators do not want to get out of their jobs, attendance is high, carrying out tasks on time, high morale, showing friendly attitude in serving, mentally and physically healthy, complete the task quickly, and do not like to complain [5], creating an educational atmosphere that is meaningful, fun, creative, dynamic, and dialogical, has a professional commitment to improve the quality of education, and exemplifies the good name of the institution, profession, and position in accordance with the trust given to him [6-7]. Teachers who are satisfied with their work will be productive, will develop and maintain a high level of performance, making the teaching and learning process more efficient and effective so as to produce students who highly competitive [8].

![Diagram](image)

**Fig. 1. Research Theoretical Model**

Job satisfaction as a psychological force that encourage individuals to have motivation and enthusiasm in achieving organizational goals is influenced by various factors, including compensation, promotion opportunities, job security, working conditions and the work itself [8-9], remuneration and awards received [9], reward and recognition, supervision [4], organizational climate [10], transformational leadership, individual performance, financial compensation system [11], transformational leadership [12], interpersonal communication [13] and achievement of goals [14].

According to House, job satisfaction was influenced by perceptions and individual motivation, leadership style (directive, supportive, participative, and achievement-oriented), individual characteristics (locus of control and ability), and organizational environment, task characteristics, formal authority systems, and primary work groups [15]. Lawler and Porter explained that job satisfaction is determined by individual perceptions of rewards obtained based on performance [16-17]. Fratrat and Starke also state that job satisfaction is determined by various factors that support one another: employee need structure, job motivation, productivity, rewards [18]. Robbins & Judge (2008) also explain the possibilities that make a person feel satisfied in their work is the job itself, wages or salaries, promotions, and co-workers. Korman (1978) states that the factors that can determine the formation of job satisfaction are occupational levels, job content, attentive leadership, payment and promotion opportunities, and social interaction in work groups.

Based on the explanation above it can be stated that job satisfaction is influenced by a number of variables, but in this study is limited to the leadership qualifications of principals and the characteristics of educator working groups. The principal’s leadership is an important element in realizing the achievement of goals and advancing school and maintaining its existence. Success of managing a school to achieve its goal is a manifestation of the ability of the principal as a leader to mobilize and utilize the resources in the school [20]. One form of leadership carried out by the principal realizing the achievement of school goals is transformational leadership. Transformational leadership carried out by principals is motivating followers to increase their level of understanding of usability and value from detailed and ideal goals, making them express the interests of the team or organization rather than personal interests, and move them to try to meet the needs of higher levels [21].

The essence of transformational leadership is to empower followers to perform effectively by building their commitment to new values, developing their skills and beliefs, creating a climate conducive to the development of innovation and creativity [22], so followers feel high psychological satisfaction in his work. The success of an organization achieving its goals is also inseparable from the influence of the working group’s characteristics. The working group is a number of individuals involved in a particular field of work where there is a reciprocal relationship between individuals who are bound psychologically, resulting in mutual dependence on one another and having the same interests to achieve organizational goals. The effectiveness of collaboration in work groups has an impact on group outcomes, one of which is job satisfaction [23]. Thus, it is assumed that transformational leadership and work group characteristics can influence the job satisfaction of educators.
2 Methodology

This type of research is classified as expose facto causal research. The target population of this study were all permanent teachers who served at HKBP Private Senior High School in North Sumatra with \( N = 292 \) teachers while the sample unit size was determined by referring to Harry King's Nomogram Table of 45% with 0.05 precision = 131 teachers, and the selection of samples using proportional random sampling. Data collection was conducted through questionnaires that had been tested for validity and reliability, while the research data were analyzed using descriptive and inferential statistical analysis. Hypothesis testing is done by path analysis.

3 Results and Discussion

Descriptive data analysis results are presented in Table 1 below:

Table 1. Summary of Results of Descriptive Data Analysis of Research Variables

<table>
<thead>
<tr>
<th>No</th>
<th>Statistic Descriptive</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sample (N)</td>
<td>131</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>2</td>
<td>Minimum Skor</td>
<td>63</td>
<td>61</td>
<td>62</td>
</tr>
<tr>
<td>3</td>
<td>Maximum Skor</td>
<td>185</td>
<td>164</td>
<td>149</td>
</tr>
<tr>
<td>4</td>
<td>Range</td>
<td>122</td>
<td>103</td>
<td>62</td>
</tr>
<tr>
<td>5</td>
<td>Number of Interval Class</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>Length of Interval Class</td>
<td>16</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>7</td>
<td>Mean (M)</td>
<td>132.76</td>
<td>118.21</td>
<td>112.25</td>
</tr>
<tr>
<td>8</td>
<td>Median (Me)</td>
<td>139.37</td>
<td>124.25</td>
<td>114.12</td>
</tr>
<tr>
<td>9</td>
<td>Modus (Mo)</td>
<td>161.70</td>
<td>136.14</td>
<td>119.80</td>
</tr>
<tr>
<td>10</td>
<td>Deviation Standard</td>
<td>34.50</td>
<td>28.31</td>
<td>19.69</td>
</tr>
<tr>
<td>11</td>
<td>Ideal Minimum Skor</td>
<td>41</td>
<td>36</td>
<td>33</td>
</tr>
<tr>
<td>12</td>
<td>Ideal Maximum Skor</td>
<td>205</td>
<td>180</td>
<td>165</td>
</tr>
<tr>
<td>13</td>
<td>Ideal Mean</td>
<td>123.50</td>
<td>108</td>
<td>99</td>
</tr>
<tr>
<td>14</td>
<td>Ideal Deviation Standard</td>
<td>27.33</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>17392</td>
<td>15485</td>
<td>14705</td>
</tr>
</tbody>
</table>

X1: Transformational Leadership;
X2: Characteristics of Working Groups
X3: Job Satisfaction

Based on the data analysis above it can be seen that:

(a) In general, educator job satisfaction is in the medium category with an average of 112.25. Analysis results of the overall aspects of job satisfaction are the highest aspect of satisfaction perceived by educators is found in the aspect of the job itself with an average value of 4.33 while the lowest perceived satisfaction is on the payroll aspect with an average value of 2.59.

(b) Principal transformational leadership is categorized as sufficient with an average of 118.21. Analysis results on the principal's transformational leadership dimensions indicate that individualized consideration is the highest average value of 3.70, and the lowest is intellectual stimulating of 2.82.

(c) Support characteristics of the educators working group are quite sufficient with an average value of 132.76. Analysis results of the characteristics of the working group showed the group cohesiveness indicator gave the highest support with an average value of 3.88 and the lowest was the composition of the group with an average value of 2.71.

After analyzing the correlation between variables, then continued with path analysis of the research variables. The summary of the path coefficient estimation results on the research variables is presented in Table 2.
Table 2. Summary of Calculation Results of Pathway Coefficients

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>t</th>
<th>t(0.05)</th>
<th>t(0.01)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \rho_{31} )</td>
<td>0.19</td>
<td>2.51</td>
<td>1.65</td>
<td>2.33</td>
</tr>
<tr>
<td>( \mu_{12} )</td>
<td>0.19</td>
<td>2.59</td>
<td>1.65</td>
<td>2.33</td>
</tr>
</tbody>
</table>

Based on the data analysis above, it can be stated that transformational leadership has a direct and positive effect on the job satisfaction of educators in HKBP private high schools north sumatera. And it also can be stated that the characteristics of work group directly and positively influence the job satisfaction of educators in HKBP private high schools north sumatera. Based on the path coefficients obtained, we can illustrate the model path diagram in figure 2 below.

![Fig. 2. Empirical Causal Relationships X1, X2, X3, and X4 to X5](image)

Table 3. Summary of Direct and Indirect Influences on \( X_3 \)

<table>
<thead>
<tr>
<th>Variable</th>
<th>( R^2 )</th>
<th>Direct</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X_1 )</td>
<td>0.30</td>
<td>0.19</td>
</tr>
<tr>
<td>( X_2 )</td>
<td>0.30</td>
<td>0.19</td>
</tr>
</tbody>
</table>

The first hypothesis, shows the high and low job satisfaction of educators directly influenced by transformational leadership (\( x_1 \)) of 0.19. The second hypothesis, shows the high and low satisfaction of educators influenced by the characteristics of the work group (\( x_2 \)) of 0.19.

The results of testing hypotheses have shown that educator job satisfaction is influenced by transformational leadership and the characteristics of work groups. The more effective principal’s transformational leadership, the higher the job satisfaction of educators, and the better the support of the characteristics of the work group, the higher the job satisfaction of educators. This finding explains that educator job satisfaction can be improved through the effectiveness of principal’s transformational leadership and the development of work group characteristics. Therefore, the effectiveness of the principal's transformational leadership still has to be improved in order to increasing job satisfaction of educators. Psychologically, from each educator as an inseparable group member, there is a feeling of mutual assistance, mutual support, and a sense of mutual interest in achieving the goals of the school organization. Working groups based on strong psychological ties are believed to be one of the motivations of educators to remain loyal to their work groups and can increase high job satisfaction.

Three variables examined in this study are all in the sufficient category. This shows that educators have not felt the maximum support from the school organizers or foundations as one of the main responsible elements in the empowerment of human resources and the support of educators in schools. This is in accordance with one of the basic principles of HKBP education management item 2.10. which states that the empowerment of educational institution human resources is the key to achieving success in the effort to
improve the quality of sustainable human resources, including teachers / lecturers, leaders, academic support staff and administrative staff. This HR empowerment system consists of pre-service training, education/training in positions, and welfare (salary, etc.).

In terms of management theory, descriptive research findings can be said that the education management system practiced practically in HKBP education still has not paid attention to the psychological and sociological variables of educators optimally, but educators are required to achieve good school education results. This is in accordance with scientific management theory initiated by Fredrik W. Taylor to focus his attention on physical production or satisfactory results or performance, not paying attention to the psychological and sociological variables of employees. The orientation of Taylor's theory is that direct production increases that tend to equate workers with machines, need attention from their supervisors in order to work and provide high productivity [23]. This finding suggests that the management of HKBP education providers needs to apply a human relations orientation approach, as initiated by the Hawthorne Study with its followers such as Elton Mayo, Fritz J. Roethlisberger, Abraham Maslow, and others. This theory views that human relations in management are in the organizational context. This means that the informal working group of employees' social environment has a big influence on productivity, there needs to be attention to social needs and self-actualization of employees so that he is eager to work as an opportunity to excel himself without any supervision. This human relations approach suggests that managers use psychological techniques that are associated with human behavior, greater attention to employees. Thus to improve the condition of educators, management of the HKBP education foundation needs to make the school organization a "happy big family" with an emphasis on educator motivation and satisfaction as well as group spirit that results in a commitment to achieving the goals of the school organization.

Job satisfaction can grow and develop in a person because it is supported by a number of factors. The results of previous studies have proven this. Research by Irma Tabah and Ozaira Zafar concluded that compensation, promotion opportunities, job security, working conditions and the work itself could positively influence the level of job satisfaction of academic staff at state and private universities in Pakistan. Gathungu & Wachira's (2013) study also found that remuneration and rewards have an influence on job satisfaction if only considered fair. Shah et al. (2012) found that there was a significant and positive relationship between reward and recognition, supervision, and work itself, with job satisfaction. The results of these studies have supported the theories put forward by experts that there are a number of determinants of job satisfaction. This can be seen from the Robert House Path-Goal Theory, and the theory of job satisfaction from other experts such as Porter-Lawler, Ferratt and Starke, [24-25] and Howel and [26]. The findings of this study have supported these theories by demonstrating that transformational leadership factors and the characteristics of work groups can influence the job satisfaction of educators. It means that:

(a) Principal’s transformational leadership needs to be improved in order to increase the work satisfaction of educators. The findings of this study support the opinion of DA Waldiman& FJ Yamimirino and B Shamir. RJ House & MB Arthur stated that the results obtained as an effect of the behavior of transformational leaders shows the personal commitment of followers to their leaders and visions, arising self-sacrifice behavior of followers for the sake of the organization, organizational commitment, satisfaction with followers because they feel duty what he does is meaningful for himself and for the organization. This finding also supports the results of MarnisAtmojo's research which states that: transformational leadership significantly influences job satisfaction. Ni Komang Sukertiasih's research also shows that authentic transformational leadership has both direct and indirect effects on teacher job satisfaction. According to this theory the effect of leader behavior results in an increase in intrinsic motivation, achievement, and willingness of the followers and work groups voluntarily to achieve goals have an impact on increasing job satisfaction perceived by employees in carrying out their duties.

(b) Characteristics of work groups can determine the high and low level of educators’ job satisfaction. The findings of this study suggest that educators will feel a high level of job satisfaction if supported by the characteristics of a good working group such as the support of a group composition state, the recognition of one's status in the group (hierarchy of status), a person can carry out his role in accordance with his position or status group, each group member acts according to group norms, group leaders can carry out their roles in a balanced manner between task demands and maintaining human relations, and are supported by high group cohesiveness so that members have a strong commitment to support the achievement of group goals and objectives. This is consistent with the
group formation model theory and its development proposed by [27], which states that the results of the characteristics of the working group have an impact on the performance, satisfaction, and development of the next group. [22] stated that the higher the level of group cohesiveness, the higher the performance and satisfaction of group members. This finding supports the theory put forward by Coulquitt, LePene, and Wasson in an integrative model of organizational behavior that places job satisfaction as one of the variables of individual mechanisms directly influenced by the group mechanism, namely leadership, processes and characteristics of the team or work group. This finding also supports the statements of Ivancevich, Konopaske and Matteson in the group formation and development model, that job satisfaction is directly affected by the characteristics of work groups. In connection with this, there needs to be a good working interaction between one educator and another educator even with education personnel in other school, helping each other, encouraging each other, and supporting each other for the realization of high attitudes of educator job satisfaction in schools.

4 Conclusion

Based on the results of data analysis and discussion of research results, a number of information can be summarized as follows:

a. The tendency of transformational leadership, characteristics of work groups, and job satisfaction of educators is in the sufficient category.

b. Transformational leadership directly affects the work satisfaction of educators. That is, the more effective the transformational leadership of the principal, the higher the level of job satisfaction of educators.

c. Characteristics of work groups directly influence the job satisfaction of educators. That is, the better the support of the characteristics of the working group, the higher the level of job satisfaction of educators.

References


Implementation of Education Management Standards Policy in The Medan City Education Department Office

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Abstract. This study aims to find out how the support of communication, resources, disposition and structure of the bureaucracy and how is the consistency in implementing standard management policies in Education in the Medan City Education Office. These supports were obtained by observing, interviewing and studying documents at the Medan City Education Office, especially the head of the Primary and Secondary Education Division, and as a source of triangulation carried out also in elementary schools in Medan City. Selected SD Negeri Percobaan Medan, SDIT Al Fityan Medan, and also SDIT Al Munadi Medan. Interviews were conducted with the head of the Medan City Education Office in the Field of Primary and Secondary Education, head of the Medan Experimental Public Elementary School, Al Fityan Medan Elementary School, and Medan SDIT Al Munadi. Likewise, observation and documentation study. From the results of interviews, observations and documentation studies it was found that (1) communication aspects are less supportive of the element of information clarity, (2) aspects of resources have supported policy implementation, (3) the disposition aspect shows the support of the attitude of the apparatus in the school in carrying out a fairly good management standard policy, (4) aspects of the bureaucratic structure that are in accordance with the TUPOKSI are supplemented by SOP support in each school for certain needs.

Keywords: Implementation, policy, management, education, Medan

1 Introduction

Education is a joint process between the government as a determinant of policy in terms of quality and service standardization, the community as subjects who get education services and also third parties as users of the Education product. To achieve quality and quality education, a number of quality implementation components are needed starting from the implementation regulations, education and education personnel resources, curriculum, facilities and quality assessment systems. The government issued various policies as a rule in the implementation of education in this country, preceded by the issuance of the law, followed by government regulations as its operationalization, and so on until the issuance of SOPs (standard operating procedures) in schools in implementing various policies technically. Referring to the theme of long-term education development based on Law Number 17 of 2007 concerning the National Long-Term Development Plan (RPJPN) for 2005-2025. Alignment of
the theme and focus of Education development at each stage is further formulated in the 2005-2025 Long Term National Education Development Plan (RPPNJP), as shown in table 1.

Management of Education especially Primary and Secondary Education is focused on children's character education. To realize the positive character there is what is called strengthening character education and child-friendly school programs. How do schools manage education that prioritizes character education, based on child-friendly schools by involving the participation of various formal and non-formal institutions? This study is intended to explore how communication support, resources, disposition or attitude of the apparatus and the structure of biroraksi and the consistency of the implementation of standard policies for the management of education in schools under the Medan City Education Office.

1.1 Public Policy

The definition of policy according to political scientist Carl Friedrich [1]:

Is an action that leads to a goal proposed by a person, group, or government in a particular environment due to the existence of certain obstacles while seeking opportunities to achieve goals or realize the desired goal.

Knoepfel and his colleagues emphasized Friedrich's statement when they interpreted the policy as "a series of decisions or activities resulting from structured interactions between different actors, both public and private, who are involved in various ways in the emergence, identification and resolution of a problem defined politically as a public one "(a series of decisions or actions as a result of structured and repeated interactions among various actors, both public/government and private / private involved in various ways of responding, identifying and solving problems that politically defined as a public problem [2].

1.2 Implementation of Public Policy

Merilee S. Grindle [2] says that public policy is influenced by two major variables, namely the content of policy and the environment of policy implementation (context of policy). While Daniel A. Mazmanian and Paul A. Sabatier [3] stated that the success of public policy implementation was influenced by three groups of variables, namely the characteristics of the problem, the characteristics of policies / laws, and environmental variables. On the other hand, Van Meter and Van Horn [2] state that there are at least five variables that influence the implementation of public policy. Namely policy standards and objectives, resources, communication between organizations and strengthening activities, characteristics of implementing agents, and socio-economic and political conditions.

Daniel A. Masmanian and Paul A. Sabatier [4] explain the concept of implementation as understanding what actually happens after a program is declared valid or formulated is the focus of policy implementation attention, namely events and activities that arise afterwards ratification of public policy guidelines that cover both efforts to administer it and to cause real consequences or impacts on society or events.
Edwards III, who said that the implementation of policy is part of the stages of the policy process that is between the preparation of policies and the consequences that can arise from the implementation of the policy [5]. According to Edward III, there are four aspects that influence the implementation of public policy, namely communication, resources, disposition or attitude of the implementer, and bureaucratic structure.

1.3 Management Standards

Management standards are one part of eight national education standards as stated in government regulation number 23 of 2013 concerning changes to government regulation number 19 of 2005 concerning national education standards. It is stated that national standards are the minimum criteria regarding the education system in all jurisdictions of the Unitary State of the Republic of Indonesia. There are eight national education standards, namely graduate competency standards, content standards, process standards, educator standards and education staff, facilities and infrastructure standards, management standards, financing standards, assessment standards.

Management standards are national Education standards relating to the planning, implementation and supervision of Education activities at the level of the Education unit, district/city, province, or national to achieve efficiency and effectiveness in the implementation of Education (PP No. 19 of 2005 concerning National Education Standards). States that management of education requires the realization of all management functions in administering education, including planning, organizing, actuating, and controlling. The components of the management standard based on Minister of Education Regulation No. 19 of 2007 is program planning, implementation of work plans, and evaluation [5].

2 Methodology

2.1 Research subject
The subject of this study consisted of the Head of the Medan City Education Office in the Field of Primary and Secondary Education as the main subject and as the supporting subject was the head of Medan Primary School 1 Experiment, head of the Al Fityan SDIT Medan, and Head of SDIT Al Munadi Medan.

2.2 Data collection technique
Data collection in this study uses interview, observation and document study techniques.

2.3 Data Analysis Techniques
Data analysis techniques in this study used an interactive model consisting of data collection, data reduction, data presentation, drawing conclusions and verification.

3 Results and Discussion

This study describes the implementation of standardized education management policies in elementary schools under the Medan City Education Office based on the theory of public policy implementation formulated by C. Edwards III.
The results showed that support for policy implementation was based on the theory of C. Edwards III on aspects of communication, resources, disposition / attitude of the apparatus, bureaucratic structure

3.1 Communication

Based on the results of observations, interviews, and also documents found by researchers during carrying out this research, the researcher draws conclusions related to communication that was built in implementing the policy regarding Education Management Standards in schools under the Education Office is already in accordance with the theory delivered by Edward III. Especially for the transmission aspect and also the consistency of the communication. What was built started from the Education Office, in this case the Head of the Basic Education Division to the elementary and lower school principals both public and private. Except for newly established schools, there are still those who have not received socialization and guidance directly from the Education office. Even though the supervisors at the sub-district level still get their guidance.

While for the aspect of clarity of information regarding management standards, it is less fulfilling considering there is no specific explanation and also technical guidance regarding the standard of management of basic education by the Medan City Education Agency. But in general, it is, namely, the National Education Standards where Education management standards are one of the standards contained in them.

3.2 Resource

Policy implementation must be supported by supporting resources, such as human resources, methods of implementation, and material that is made into policy. Without adequate resource support, the policy product will be an administrative document that does not have an impact on the community. Resources that support the implementation of public policies include adequate staff, complete information, funding that includes all programs, structured authority, and other supporting facilities. (Affandi and Warjio in Ramdhani, 2016)

Based on the results of observations, interviews and document studies that the researchers did during carrying out this research it was found that the staff available to implement the management standard policy were quite numerous and fulfilled the expected competencies of the implementation of the management standard policies. The principals are technical executing officials at their respective schools who have a minimum education background of undergraduate degrees. In addition, the training carried out by the Education Office through sub-district supervisors and directly carried out by the Education Office can help school principals to implement the management standards in their schools to the fullest.

Availability of sufficient and easily accessible information on this management standard, although it is not obtained directly from the Education Office, but the school principals can directly access it via the internet and through discussion forums followed by the principal. This has led to the availability of information about the standard of Education management until the technical instructions for its implementation are easily obtained and applied by school principals. Although still, there must be guidance and direction from the Education Office, in a smaller capacity through school supervisors in each sub-district.

Funding provided by the government through BOS funds is considered to be still inadequate for the operations of all activities and programs run by schools. Therefore, principals based on the guidance and direction of the Education Office mobilize the potential and role of parents to help programs and activities in schools work hand in hand for the implementation of programs or activities designed by the school. By continuing to prioritize
the principles of openness and cooperation, parents of students become more caring and prepared to help schools for the education of their children.

The authority attached to the Education office to force school principals to work in accordance with their Tupoks meet various administrative standards expected in Education management standards. Similarly, the authority of the head of school is to force teachers to work well in accordance with Tupoksi so that the implementation of Education management standards can run well. Good facilities are certainly one of the factors that support the implementation of policies regarding Education management standards. From the observations and also the results of interviews of researchers that elementary schools, both public and private, have begun to provide facilities to support the implementation of standardized Education management in their respective schools. Both in the form of facilities and infrastructure in schools are directed to support the successful implementation of management standards in schools.

3.3 Disposition / Attitude of Apparatus

Tendency is the attitude shown by the policy organizers in supporting the implementation of a policy. The better the attitude shown by the apparatus on a policy, the more real their support for the implementation of the policy will be in the form of the application of its work programs. On the contrary, the more different the attitude shown by the implementing apparatus, the more difficult the implementation of the policy will be [6-7]. Based on the results of the interview, observations during the observation the researchers found that the attitude shown by the staff starting from the principal and also the teachers in carrying out the programs that had been compiled looked very good and helped smooth it out.

Even though there are problems found after tracing more to the obstacle of communication that is clogged between one party and another. And after further clarification and explanation, usually the attitude that is raised is the attitude of support and cooperation so that the results obtained are also maximum. Coupled with exemplary and also an open attitude from the principals to the teachers makes the atmosphere of a more lively and vibrant work environment. The result is satisfaction from the teachers, students are well served, and of course parents as school partners feel the benefits directly to their children as a fruit of the process carried out in school.

3.4 Bureaucratic Structure

Basically, every policy implementer knows what must be done, has resources that support its implementation, but in its implementation, they are hampered by the organizational structure where they are required to implement the policy [8]. According to researchers, the implementation of management standards in schools under the Education Office is inseparable from the neat working structure of the organization. It is not merely the complex structure that is built, because it will be related to the availability of personnel at school. However, more to the division of work and the right responsibilities to the right people will have more influence on the successful implementation of these Education management standards at the school level as implementers. And this is in accordance with the theory put forward by Edwards, that the most important are people who know what, how, they will do to support work programs that are compiled, implemented and evaluated later. Few but understand working more effectively than many but don't understand what they want to do and how to do it.

Based on observations, interviews and study documents that the researchers did during the period of this study it was found that the principals always had a special team that helped various jobs in the field. And the right division of work to the right people is certainly done
through a process that is not short, needing to change personnel several times to be given the right tasks and responsibilities. Until finally a solid, strong and precise team was formed.

4 Conclusion

Implementation of standardized management of education in elementary schools under the education office of the city of Medan in accordance with Minister of National Education Regulation No. 19 of 2007 concerning Management Standards for Primary and Secondary Education is supported by several factors. These include: (1) communication, (2) resources, (3) apparatus’ attitude, and (4) bureaucratic structure.

Each supporting factor is related to one another, and which is used as a benchmark to assess the success and consistency of the implementation of education management standards for elementary schools under the Medan City Education Office whether or not it is in accordance with the policy direction.

References

A Descriptive Study on Character of Non-Formal Education Students

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Abstract. Character is very necessary for university students. However, many of the students show poor performance due to their character problems. The purpose of this research was to describe how character of non-formal education students while studying at University. There were 265 undergraduate students as research population. After determining sample randomly, out of 120 students who participated in this study, there are four main characters performed by non-formal students consist of: (1) lack of creative mind in learning and socializing with other friends; (2) plagiarism while conducting assignments; (3) Laziness to comprehending text book and journal; (4) undisciplined to study. Therefore, lecturers should more engage students to take a part seriously in the learning process in order to build students’ character. Further study may consider investigating how to solve non-formal students’ character.

Keywords: University students, character problems, quantitative research.

1 Introduction

Improving the quality of education in Indonesia is always conducted by solving various problems which are related to character. The character becomes very important because through the character individual may be more maximal in developing his/her potential and more beneficial for the surrounding environment or society and country. Particularly, the term “revolusi mental” is as an indication that Indonesian government is dealing seriously with character in Indonesia. Consequently, Indonesian government focuses on how to develop students’ character through education which is started from Early Childhood Education (ECD) to Higher Education (HE).

Character of student in Higher Education environments is in the spotlight and needs to be addressed now. Many behaviors of student are not in accordance with the code of ethics and have broken roles in university. For example, some of students cheat others' works, do copying paste from their friend’s works and do project with poor performance. These behaviors lead to the degeneration of student character and student dissatisfaction while studying in university.

Palila (2015) [1] emphasized that character is needed to get someone to pursue and achieve their own individual well-being. Character also leads to mental health. Therefore, while students graduate with lack of character, they only graduated with mediocre grades or
competencies that are not in accordance with the needs of the job field and societies. Those problems are very serious. Therefore, students as a college product and leader in future should be a solution to existing social or workplace problems.

Santoso (2013) [2] stated that Higher Education is a place to sow, educate and train students to become students with high reasoning, sharp and broad analysis. This is because the college's mission is teaching, research and application of science. Characters in adults like students have indeed been fossilized. Improving the character of students in principle depends on the models seen around them. So, anyone in his or her environment can be a reference for him or her to behave and act.

1.1 Character and University Students

The term character came from the Greek language which is etymologically derived from the word "karasso", meaning "blueprint", the basic format, fingerprints such as fingerprints [3]. According to Diponegoro (2010) [4] character is a personality that is evaluated based on certain values and norms. Therefore, a person who behaves dishonest, Cruel or Greedy said to be a person of character ugly, while those who behave honestly prefer to say as man of noble character [5]. The character is someone's personality and behavior. Individual who has good or superior character always tries to do the best things to God Almighty, self, others, the environment, nation and state and the international world in general by optimizing his potential (knowledge) and accompanied by his awareness, emotions and motivations (his/her feelings).

According to Curriculum Center of Ministry of Education of the Republic of Indonesia (2010) there are 18 values for character that originally derived from religion, Pancasila, culture and the purpose of national education, namely: (1) Religious: Attitudes and behaviors that are obedient in carrying out the teachings of the religion he adheres to, tolerant of the implementation of other religious services, and live in harmony with other religions (2) Honest: Behavior based on efforts to make himself as a person who can always be trusted in words, actions, and work. (3) Tolerance: Attitudes and actions that respect differences in religion, ethnicity, ethnicity, opinions, attitudes and actions of others that are different from themselves (4) Discipline: Actions that show orderly behavior and comply with various provisions and regulations (5) Work hard: Actions that show orderly behavior and comply with various rules and regulations. (6) Creative: Thinking and doing something to produce new ways or results from something that has been owned (7) Independent: Attitudes and behaviors that are not easily dependent on others in completing tasks (8) Democratic: How to think, behave, and acting that assesses the rights and obligations of himself and others (9) Curiosity: Attitudes and actions that strive to find out more deeply and broadly from what he learns, sees, and hears. (10) Nationality: Way of thinking, acting and being mindful that places the interests of the nation and the State above the self and group interests his group; (12) Appreciating Achievement: Attitudes and actions that encourage him to produce something useful for the community, and recognize, and respect the success of others. (13) Friendly / Communicative: Attitudes and actions that encourage him to produce something useful for the community, and acknowledge, and respect the success of others. (14) Love of Peace: Attitudes and actions that encourage him to produce something useful for the community, and acknowledge, and respect the success of others. (15) Love of Reading: The habit of providing time to read various readings that give virtue to him (16) Caring for the Environment: Attitudes and actions that always strive to prevent damage to the surrounding natural environment, and develop efforts to repair the natural damage that has occurred (17) Social Care: Attitudes and actions that always want to help others and people in need.
Responsibilities: Attitudes and behavior of a person to carry out their duties and obligations, which they should do, to themselves, society, environment (natural, social, and cultural), the State and God Almighty.

In the context of higher education, the character that should be owned by students can consist of honesty, discipline, diligence, creativity, independence, curiosity, appreciation, and caring. For example, discipline can be shown by the habit of attending on time, getting used to obey the rules that have been mutually agreed upon, getting used to gathering tasks on time. Curiosity characters with indicators reading the language before the lecture starts, are active in learning [6]. However, by looking at the many phenomena that occurred toward student’s behavior in university environment, it is necessary to study, specifically, the character of students. The research question in this study is how are the characteristics of Non-Formal Education Students in State University of Medan? This study aimed to find out about the character of Non-Formal Education Students during studying at the State University of Medan.

This research provides both theoretical and practical benefits. Theoretically, this study contributes to filling in the gap on character, particularly, Non-Formal Education Students. Some research on student’s character are solely in certain departments, such as psychology students [1] and accounting education students [7]. Based on researchers’ knowledge, it was difficult to find study on non-formal education character. Thus, this research may be the first study conducted that may contribute to literature on the study of Non-Formal Students’ Character. Practically, this research is useful to the department of Non-Formal Education, State University of Medan and may be to other universities because this study provides some character problems of university students that took place in university environment.

2 Methodology

This research is descriptive quantitative which involved one variable solely [8]. Data collected from participants through questionnaire. All participants involved in this study were university students from the department of Non-Formal Education at the State University of Medan. Development of instruments was carried out by examining theories and previous research related to character. In addition, the research instrument was also developed based on observations and interviews conducted by researchers with Non-Formal Education Students. After testing the validity of the instrument to some experts, the four statements were used as instrument to collect data.

The research instrument was as the following statements: (1) lack of creative mind in learning and socializing with other friends; (2) plagiarism while conducting assignments; (3) Laziness to comprehending text book and journal; (4) undisciplined to study. To evaluate the responds of participants on those statements, the answer choices were provided consisting of “Yes” or “No”. After data collected by the instrument, those data analyzed using descriptive analysis techniques use SPSS 20 for Windows.

3 Result and Discussion

There were 120 Non-Formal Students involved in this study who were selected by simple random sampling technique that forty-eight (40%) of the respondents were male, while 72
(60%) were females. According to the result of research, it can be described on the character of Non-Formal Education as shown in the Table 1.

<table>
<thead>
<tr>
<th>Statements</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of creative mind in learning and socializing with other friends</td>
<td>80 (66.67)</td>
<td>40 (63.33)</td>
</tr>
<tr>
<td>Plagiarism while conducting assignments</td>
<td>75 (62.50)</td>
<td>45 (37.56)</td>
</tr>
<tr>
<td>Laziness to comprehending text book and journal</td>
<td>87 (72.50)</td>
<td>33 (27.50)</td>
</tr>
<tr>
<td>Undisciplined to study</td>
<td>73 (60.83)</td>
<td>47 (39.17)</td>
</tr>
</tbody>
</table>

In Table 1 seen in general, most of the students agreed that they conducted such as bad behavior while studying at university. Those behaviors have negative impact on students’ performance in future. The situation indicates that improving student learning, especially non-formal students are necessary to be done. [6] Santoso (2013) suggested that awareness must be increased so that students are active in learning, so that they have the ability to speak systematically, and the ability to analyze problems. This can encourage the formation of students’ character towards a better life. Lecturers must be more active in involving students in the learning process. Thus, Universities in Indonesia must take place in applying character education to students [8].

Furthermore, Soetanto (2012) [9] stated that the application of character education in Universities must be based on five main pillars, namely: (1) Tri dharma of Higher Education which character education can be integrated into education, research and community service activities; (2) College culture or student organizational culture is required for enabling students to be familiar with good character in university; (3) Student activities by doing integration into student activities, including scouts, sports, writing, art, workshops, and events that involve students in the committee system; (4) Student daily activities are done such as daily life habits in the family, dormitory and community; (5) Academic Culture which the value of character education is effectively formed by the existence of a totality of academic culture.

### 4 Conclusion

This study describes how the character of Non-formal Education students while studying in the State University of Medan. Furthermore, based on the results of the study there are four characters, namely: (1) lack of creative mind in learning and socializing with other friends; (2) plagiarism while conducting assignments; (3) Laziness to comprehending text books and journals; (4) undisciplined to study. Therefore, stakeholders, particularly, State University of Medan, need to deal seriously with the character problems that take place toward university students.

Thus, the strengthening of character education for university students is very urgent to be done. Further research on student character needs to be done more in an effort to improve the character of students, especially, non-formal education students. Higher education needs to make routine programs in an effort to improve the character of students, such as training and
conference. This aims so that the formation of student character can develop naturally and sustainably.

References
The Influence of Internet on Gadget on the Development of Children's Social and Emotional Development

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Abstract. The child is a future investment that needs to be stimulated its development from an early age. Brain cells that possessed by children from birth will not be able to develop optimally if not given proper stimulus and support for its development. Children are very sensitive to human’s acts. Children will be able to mimic or follow everything he/she saw without studying it. At times the media gadget is now very popular among the public, including children. In other words, the gadget isn’t harmful if it’s introduced to the children in only fleeting or for educational purposes. However, nowadays gadget is one of the media that parents make to calm child so they won’t disturb their parents’ work. It would have been very sad for the children of the world in terms of social, they will tend to be more subdued and prefer to be alone in doing everything. In terms of the emotion of the child will be more like getting angry and sometimes want to cry or whine when his wish was not fulfilled. They reasoned that action is more secure and easy to supervise the activities of the children. But they haven't thought of the influence of media on the children’s development of the habit of playing gadget. A lot of the negative effects that will arise among them: will be difficult to socialize, slow in development of motoric, and a significant change in behavior. So, it is very important the role of parents to supervise, control and pay attention to all activities of the child.

Keywords: Gadget, negative impact, the role of parents.

1 Introduction

Technology is currently popular among the public. The technology offers a lot of variety of human needs in the field of information and communication especially internet. An example is: in fact, for mothers, technology highly sought, not just to look for food to cook but also a place to buy or sell goods or objects that needed. For adolescents not to be outdone, it’s for pursuing the technology not just to find information, adding insights but also to communicate with others.

Then, what about the children? Children are human beings who should still be experiencing growth and development to reach the adult stage. This development should be in accordance with his age, playing with friends, communicating with parents and his teacher and peers. But in fact, in modern times, the kids are only interested in the technology world. Why? These will be described in this paper. The problem formulation of this paper is as follows: what causes that make a child addicted to technology? What is the influence of technology on the development of children's social and emotional development? What are the factors that
make children more interested in technology? How about the solution that can be applied? As for the purpose is to solve the problem of child who is addicted to gadgets.

1.1 Technology

Technology is an advanced means of communication that currently got a lot of humans’ attention. Not just among adults but also among children. In technology it is divided from some parts i.e. television, radio, mobile and the internet. And currently the most developed is the internet. The Internet is a whole series of connected computer networks using the global system of standard Transmission Control Protocol/Internet Protocol Suite (TCP/IP) Packet Exchange Protocol (packet-switching communication protocol) to serve billions of users around the world. A large number of Internet users and still growing, has been realized the Internet culture. The Internet also has great influence over science, and world views. The development of the Internet has also influenced the development of the economy. A wide range of buying and selling that previously could only be done by way of face-to-face (and some very small by mail or phone), it is now very easy and often done over the Internet.

1.2 The Meaning and History of Gadget

Gadget is a term in the language of the United Kingdom that defines a small electronic device with a variety of special functions. Gadgets (Indonesian Language: Acang) is a term originating from the United Kingdom to refer to a device or instrument that has a specific purpose and practical functions that are useful and commonly given to something new. Gadgets in a general sense is considered as an electronic device that has a specific function on each device. For example: computers, mobile phones, games and more. The gadget has functions and benefits that corresponds to its users. Functions and benefits of gadgets in General include:

a. Communication

Science is more extensive and advanced. If ancient humans communicate via inner, then developed through writing that is sent through the post. Now the time of the era of globalization a human can communicate easily, fast, practical and more efficient by using mobile phone.

b. Social

The gadget has many features and applications are right for us to be able to share the news, and stories. So with such utilization can add friends and distant relatives in a relationship without having to use a relatively long time to share.

c. Education

Along with the development of the times, now studying not only focused with the book, but through the gadgets we can access a variety of science we need. About education, politics, public, religious and science, without having to bother to go to the library that may be far to reach.

1.3 The Development of the Internet in the Present

In the current era of internet, it takes a website in support of the business of this virtual world. We know that with the internet then everything feels not limited between space and time. All dimensions are exceeded by the media the name of a website and the internet.

The development of the internet in Indonesia is very helpful in the development of every dimension of life in the world. Already now, we should optimize the potential of the internet
to promote the nation and the State. Make development of the internet in Indonesia. Let us be positive internet users.

The Impact of the Internet Positive impact In line with the times, the progress of internet technology is also increasingly going forward. The Internet can make a positive impact for users such as: The Internet as a communication medium, is a function of the internet's most widely used where every internet user can communicate with other users from around the world and the Media to search for information or data, the rapid development of the internet, making it as one important source of information and accurate.

The Negative Impact the Internet is a computer network that connects internationally and spread all over the world. This network includes millions of aircraft computers connected to each other by making use of the telephone network (either wired or electromagnetic waves). A network of millions of computers allows a variety of applications implemented between computers in a network the internet-enabled software and hardware needed. Not only a positive impact but the internet is also one of which has a negative impact, namely: Nasty site: not just open a very nasty sites can damage the morals of the young generation (even older). The perpetrator can be very irresponsible and very easy to simultaneously be the culprit, by uploading or upload a photo or porn video via internet.

1.4 Early Childhood

Early childhood is defined as a group of children who are in the process of growth and development that is unique. They have a pattern of growth and development of the specialized according to the level of growth and development (Mansur, 2005). Characteristics of early childhood Kartini Kartono in Strain Marsudi (2006:6) characteristics of early childhood as follows:

(1) Egocentric is naïve Child looked at the outside world from his view of his own, in accordance with knowledge and his own understanding, restricted by the feelings and his thoughts are still narrow. Then the child is not yet able to understand the true meaning of an event and haven't been able to put himself into the lives of others.

(2) Primitive social relationship. Social Relationships which are the result of a primitive nature naïve egocentric. This trait is marked by the life of children who have not been able to separate between the social environments of the situation himself. Children at this time only have interest in the objects or events in accordance with his fantasies of power. Children begin to build his world with fantasy and desires of its own.

(3) Physical and spiritual Unity which barely separated Children not yet able to tell the difference between a world flesh and spirit. The contents of the outwardly and spirit is still a unified whole. Children imagination against something issued or given for free, spontaneous and honest both in facial, behavior or pretending, children express it openly because it does not teach or familiarize the child not to be honest.

(4) Attitude of life Child being physiognomic against the world, it means the children directly provide the attributes or properties of outward nature of concrete, tangible or of what imaginable. This condition is caused due to the child's understanding of what faces are still fused (totalitarian) between the physical and the spiritual. Children not yet able to distinguish between living and inanimate objects. Everything around him is considered to have a soul that is a living creature that has a physical and spiritual at the same time, like himself. Children are the next generation of the nation, so its presence is so eagerly anticipated by every human being, whether it's in a family environment, society, and Government. Childhood is a time of gold that cannot happen again, time sensitive and the development of all aspects of child development,
which would later become the basis for further development. However, the ability of the child to grow and develop cannot attend. There are processes or stages that have to be gone through, which needed a stimulus from the environment to support its development optimally.

1.5 The Child's Social and Emotional Development

a) Understanding Emotions

Emotion is a complex condition, may be feeling/thoughts that marked by the biological changes that arise from the behavior of a person. According to experts, the sense of emotions:

(1) According to Goleman (1995:411) "refers to a feeling of emotions or thoughts, a biological and psychological state as well as a series of tendencies to act."

(2) According to Syamsuddin (1990:69) expressed his "emotion is a complex atmosphere and soul or appear before or after the occurrence of a behavior." The function and role of emotions on child development are:
   a. It’s a form of communication.
   b. Emotion plays a role in influencing the personality and adaptability of the child with his social environment.
   c. Emotions can affect the psychological climate of the environment.
   d. The same behavior and shown repeatedly can become a habit.
   e. Tension of emotions that children have can inhibit or interfere with the child's mental and motor activity.

b) Understanding Social Development

According to experts the notion of social development:

(1) According to Plato, is potentially man is born as social beings.

(2) Fly (1995:105) revealed a "Socialization is the process of learning to be social creatures.

(3) According to Loree (1970:86) "Socialization is a process where the individual (child) coached her sensitivity towards the stimulation of social stimulation-especially the pressures and demands of life and learning to get along with to behave like others in his social environment.

(4) According to Muhibin (1999:35) said that social development is the process of establishment of the persons in the community.

(5) According to Hurlock (1978:250) That social development is gaining the ability to behave accordingly with the social demands. "Socializing is the ability to behave in accordance with the norms of social expectations or values".

c) Characteristics and Characteristics Of Social Behavior

In the social development of children, there are several characteristics in each period, the characteristics of such traits is –

1) Baby Period

   Age 1-2 months, children have not been able to bring up the object and objects. Age 3-4 months, already strong eye look at people or objects, smile with another baby.

   Age 5-9 months, respond differently to a friendly voice or not, sometimes aggressively, holding, looking at, follow the voice and mannerisms.

   The age of 12 months, to know the restrictions. The age of 24 months, children are already helping to do simple activities
2) The Period of Pre School

As for the traits — preschool socialization characteristics are as follows:

a. to make social contact with people outside his home
b. is known by the term pregang age
c. relationship with adult
d. relationship with peers
e. 3–4 years started playing together.

2 Methodology

2.1 Withdrawal from the Social Environment

The result of the addiction of gadgets the child will feel more comfortable surfing internet and will finally pull himself from the social environment. It is very influential, because children cannot socialize with her friends to another. Social just in terms of the emotion of the child will also be short-tempered if he disturbed when playing internet chat or play by other people.

2.2 Not Easy to Get Along

If the child is always adapting to the gadget then it will be difficult to get along even joined with others. The bigger impact is when children are in place of many children around, he will be more likely to be alone. Children will be alienated from the other kids.

3 Result and Discussion

As we know, the gadget is very influential in the daily life of human beings. While this is not the only adult, children also get involved in the development of the internet today. As it has been presented with the social and emotional development of the child should develop in accordance with the age ranging from interacting with his parents to communicate with the people around him. If the internet is constantly being the center of attention of the current child what are its effects on the social and emotional development. At present most parents are too preoccupied with the world of work, by reason of wanting to send her son, wanted his son to get an education, and extended to the growth of his son. With the busyness of parenting sometimes parents feel compromised if his work combined with the activities of the children, for example children asked to play along. For the sake of convenience of parents working freely sometimes parents made children play mobile phone for example YouTube or games. In fact, it can impact better if parents provide cognitive aspects that make the site or knowledge that children gain. But sometimes parents forget that if too often give and keep on the internet that always accompany the child with no idea can open unwanted sites. Let alone if the child be left alone. It is so influential on a child's emotions are not only social but on the emotion of the child. Here are some of the impact of the gadgets on the development of children's social and emotional.
3.1 Influencing Mental Health

It’s mentally very disturbed if the child is too focused on the internet. Because the child's emotions will not be controlled. When being bullied children are going to be angry and when their Cell phone is not taken or given the child would cry will even rebellious. With an already excessive addiction when prohibited mental child will be severely disrupted. The child will more easily upset and crying without reason because of early children only know the internet and when in an environment with other children will feel foreign.

Children who do not yet know the internet friendlier, easier to smile, it's easier to socialize and have a lot of friends. The children look more cheerful and uplifting in conducting all activities especially in group activities. Meanwhile, children who are already addicted to the internet, children tend to look crankier, crying easily, like himself and silent sector in places such as when her friend playing outside the classroom children tend to be in the class play alone. Of his emotions visible when notified or given the child sometimes want advice glare her eyes and whining also won't obey. And when her parents come children tend to directly pull the bags direct take of his mother and his mother's mobile phone from inside the bags and leave the classroom directly without farewell. When her mother forbade or hide mobile from the child, the child tends to cry and shout, sometimes threatening children don't want to go home if his mother doesn't give mobile. Solution in treating children who have influenced technology in terms of which negative have been presented below:

1. Parents should take the time to the child and parent is also not allowed to use mobile phones when together.
2. Parents should be more often go to the recreational areas that can attract the attention of children. Bring him to the book store and choose an interesting book by children.
3. For teachers, teachers can give special attention to the child, such as: more often invite them to communicate and invites children to play games that are favored by children. Teachers can also invite children to be more active in group activities, for example: teachers are more likely to ask for the opinion of the child for the results of their cooperation and solve problems together.

4 Conclusion

Children are very sensitive to human development. Children will be able to mimic or follow everything he saw without studying it. In the era of internet media is now very popular among the public, not left behind are children. In other words, the internet does no harm to be introduced to the children if only fleeting or for educational purposes. However, nowadays internet media is one of the parents that usually use to make child calm and not so they won’t interfere with parents in work. It would have been very sad for the world. Because the internet greatly affects social and emotional of children. In terms of social children tend to be more reserved and prefers to be alone in doing everything. In terms of the emotion of the child will be more like the angry and sometimes want to cry or whine when his wish was not fulfilled. We as adults should understand that it takes a child is not a chattel which although can satisfy the child but social and his emotions is disturbed, the child should require someone who can make him happy and cheerful in doing in all things. Children should play freely, explore her into a world that is supposed to be owned by early childhood. More parents should take the time for the child. Since it’s parents that introduce children to the outside world to a good environment for the development of the child and to the world that make the children
understand that it’s not just her who exist but many friends or anyone else who can be the proximity to corporate.

References


Analysis of the Use Effectiveness of Lighting Lamps Type for Household Needs

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\textbf{Abstract.} Lighting is very important in various activities in the household, so it becomes dominant in the review of electricity consumption needs. The problems faced by consumers in choosing the use of lighting generally only choose based on the type of lamp which is cheaper, without considering the quality of light and electrical energy used. This study aims to find profiles several types of lights based on the strength of the light produced, the use of electrical energy, and its sensitivity to lower voltage sources. The results of the study recommend a type of lamp that is considered efficient for users. The research method uses experimental approaches. The study was conducted by testing the strength of the light produced, the amount of electrical power used, and the sensitivity to lower voltage sources. Data collection techniques are carried out by measurement and testing. Data analysis was carried out with a quantitative approach and continued with qualitative analysis. The results showed that, (1) the types of Light Emitting Diode (LED) lamps produce better light power compared to Energy Saving Lights (ESL) at the same electrical power consumption, and (3) LED lighting components have better capability in facing a lower voltage source.

\textbf{Keywords:} Lighting, energy saving, illumination

1 Introduction

One of the main needs for electric power in human life is for lighting needs. Almost all human activities both day and night must use lighting, so with such a large amount, it will definitely be very much in need of very large electricity usage \cite{1}. The magnitude of the need for lighting, coupled with the development of a variety of lighting products, so that the number and type of lighting circulating in the market is very large. This happens because the creation of energy saving lighting is something that is considered very important in an effort to meet human needs. The problem that arises with the presence of various types of lighting brand products on the market, is the lack of information on the characteristics of the lights, so that consumers do not have references in choosing according to their needs. Consumers or users do not have information that whether the circulating lights all really have high efficiency, or whether a type of lamp is better compared to similar lights with different brands.

The need for lighting in a household must consider the electrical power used to produce the needed power. The ability of a lamp that must be known to produce light is its light efficacy. Light efficacy is the ratio of the brightness of each watt, the power can be a light flux from the source output, or it can be the total electric power used by the source. The discovery of sharing types of lighting today is very helpful for consumers in meeting their needs. There
are several types of lights circulating in the market, although some of them have started to be abandoned by the management, such as incandescent lamps which are considered inefficient anymore, Tubes Lamp (TL) or full fluorescent lamps are no longer used because in addition to being environmentally unfriendly also more electricity consumption high. The types of lights that are more widely used by consumers today include ESL and LED types.

ESL is a type of fluorescent lamp that uses the principle of the process of fluorescent mineral glow where minerals are exposed to ultraviolet light and then react with gas inside the lamp, which produces ultraviolet light. Ultraviolet light then acts with phosphorus, which is a mixture of minerals that line the inside of the light bulb. Whereas LEDs are special semiconductor diodes. LEDs consist of a semiconductor material chip that is fully charged, or dop, with impurities to create a structure called p-n junction. The wavelength of the light emitted, and its color, depends on the difference in the energy band from the material that forms the p-n junction. The LED chip has positive and negative poles (p-n) and will only light up when given an advanced current. This is because LEDs are made of semiconductor material which will only allow electric current to flow in one direction and not in the opposite direction. Light on an LED is electromagnetic energy emitted in a visible portion of the spectrum \[2\]|3\]. Characteristics of LED include: Has a longer service life than ordinary lights, can achieve durability of up to 30 thousand hours, has energy efficiency of up to 80-90 percent, is able to work at low electrical voltages, the light produced is not hot.

To obtain information about a product that has good quality, conformity to consumer needs, then of course it can be obtained from the results of testing and research that it does. The results of the study by \[4\]|5\] found that the type of LED lights had the best effectiveness compared to the types of fluorescent lamps and incandescent lamps, because they had the smallest level of energy discharge with an average efficiency of 32% and produce large lighting intensity with an average of 30 lux. \[6\] confirmed that the lumen / watt value of an LED is the binning value that the LED has, so the smaller the binning value the better the quality of the lamp.

Based on these conditions and facts, the study in this study was conducted to find out, the characteristics of various types of lamps that are circulating in the market, especially those related to ESL and LED, in order to enrich the information to the user community in order to choose according to their needs. The findings in this study will find a type of lamp that is more effective for producing light and lower use of electric power, and also determines the sensitivity level of each type of lamp to reducing the voltage source. This research will certainly provide information to students as a reference in the study of the field of lighting installation.

2 Methodology

This study uses an experimental approach. The research was carried out by using measuring instruments in the laboratory such as lux measuring instruments, wattmeter, voltmeter, amperage meter, cosϕ meter and other equipment such as voltage regulators and dark room settings. The measurement of the strength of the light produced by the lamp is carried out in the dark room, with a measurement distance between the point of the light and a 2.5-meter measuring instrument. The measurement of the strength of light is carried out at a voltage variation that is gradual up to the normal voltage. The data generated from the
The type of lamp that is the research sample consists of types of ESL and LED lamps. Whereas the lamp brand which is the research sample consists of: Hannochs, Philips, NVC, Sun Free, Omai, and Sun Sonic. The number of lights that became the research sample amounted to 100 lights. Data analysis was carried out quantitatively and descriptively. The data obtained are grouped, presented in the form of data that is easy to read, then used to describe the characteristics of the type of lamp being tested. The resulting data is also used as a comparison between the same type of lamp from different products. The different test used is a different type of parametric test if the data requirements are met, but if the data requirements are not met for the parametric test, a nonparametric difference test is used.

3 Result and Discussion

3.1 Profile of Electric Power Usage and Strong Lamp Lighting

![Chart](image)

Fig. 1. Profile of Electric Power and Strong Use of LED Lighting.

The measurement results on the use of electric power and the lighting power of each lamp tested at normal voltage indicate that the types of LED lights for each brand produce different strong lighting characteristics. The measurement results show that Hannochs lamp types and NVC lamp types tend to produce relatively linear characteristics between the use of electric power and the lighting produced by the lamp, but for philips and sun free lamps, the characteristics are not linear between the use of electric power and the light produced light. This condition can be seen in Figure 1.

In the same condition the measurement of each type of ESL lamp shows the results of different lighting strong characteristics (Figure 2).
3.2 Sensitivity Profile of Lights Against Electrical Voltage

Based on the results of testing carried out with voltage changes supplying 3W, 4W, and 5W lights, the data obtained as shown in Figure 4. From Figure 4 it can be seen that the types of 3W and 5W hannochs lamps can produce 15 lux light at 150 Volt, while lamp Philips 4W type can produce light after obtaining a 200 Volt electric voltage. This shows that for a small type of LED light, Hannochs type of lamp shows better sensitivity, because it can turn on at 150 volt.

Furthermore, based on the results of testing carried out with voltage changes supplying the 7W lamp, data is obtained as shown in Figure 5. From Figure 5, it can be seen that the type of philips lamp shows the best lighting profile, because the type of Philips lamp can produce 45 lux at a voltage of 100 Volt. When viewed from sensitivity to electrical stresses, the type of NVC lamp shows the ability to produce light at a lower voltage at 50 Volt which is capable of producing 10 lux illumination, although this type of lamp is only able to produce 40 lux of light at normal voltage. and will stabilize starting at 120 Volt.
The test results are carried out with voltage changes supplying 9W and 12W lamps, the data obtained as shown in Figure 6. From Figure 6 it can be seen that for the 9W lamp power, the type of philips lamp shows the best lighting profile, because the type of Philips lamp can produce 45 lux light at 100 Volt voltage. When viewed from sensitivity to electrical stresses, the type of sun free 9W lamp shows the ability to produce light at a lower voltage at 50 Volt which is capable of producing 5 lux illumination power, although this type of lamp is only capable of producing 30 lux illumination at voltage normal, and will produce light according to the amount of voltage received.

Based on the results of testing carried out with voltage changes supplying ESL 8W, 11W, 12W and 14W lights, data is obtained as shown in Figure 7. From Figure 7 it can be seen that all types show relatively similar sensitivity to voltage characteristics, where all types of lights produce light starting at a 100 Volt supply voltage. From the data illustrated, it is also seen that the 8W hannochs lamps show the ability to produce stronger lighting characteristics that are better when compared to the types of ESL lamps with 11W and 14W power.

Based on the results of testing carried out with voltage changes supplying ESL 18W, 20W, and 35W lights, data is obtained as shown in Figure 8. From Figure 8 it can be seen that all types indicate the type of Philips 18W lamp has a relatively better sensitivity to voltage.
characteristics, where this type of lamp is able to produce light starting at a 100 Volt supply voltage. From the data illustrated, it is also seen that the 18W type of hannochs lamp shows the ability to produce stronger lighting characteristics that are better when compared to the types of ESL lamps with 18W up to 35W tested.

Fig. 7. ESW 18W, 20W and 35W Lamp Sensitivity Profiles Against Electricity Changes

Based on profile data in Figure 2, it can be seen that when viewed from the use of electrical power used by a lamp to produce strong lighting, the type of Philips 7W lamp and type of 12W NVC lamp look more effective to produce the required light. Furthermore, if viewed from the comparison of lamp types based on their power, it can be seen that for 3W and 5W power for Hannochs lamps, and 4W lamp power for philips lights show comparable characteristics. This means that the power used is proportional to the lighting power produced. Therefore, users can choose based on the lighting requirements needed.

In figure 3 the ESL lamp profile shows that for the type of Hannochs lamp power 14W shows a non-linear illumination with the electrical power used. The same thing is also seen in the type of 14W philips power lamp. This means that lamps with a power of 14W both on the types of hannochs lamps and types of Philips lamps do not produce strong lighting that is in accordance with the power used. 18L ESL lights for Hannochs type lamps and Philips type lamps show the characteristics of the comparison between the use of electric power and the same strong lighting. This means that especially for the 18W ESL lamp types have the same characteristics. Meanwhile, the type of Omai lamps and sun free shows the incompatibility between the lamp labels and the use of electrical power.

Data from measurements on the types of LED and ESL lamps indicate that LED type lights provide better light efficacy when compared to the ESL type light efficacy [7]. This means that the comparison between the power used and the strong illumination produced is better in LED lights when compared to that produced in ESL lamps. Thus, the types of LED lights on the market have relatively better characteristics compared to the types of ESL lamps. LED lights and ESL types, both of which have a discrepancy between the power on the lamp label and the measured power. Power deviations between labels and measured objects in ESL lamps reach an average of 18.88%, while deviations in types of LED lights averaged 9.88%.

Different test results show that there are differences in the ability to produce strong light from various types of lighting that are circulating in the market, where the average LED light is capable of producing better lighting power when compared to the type of ESL lamp. The ability to accept lower voltages also differs between types of LED lights with ESL types of lights, where LED lights are more flexible in accepting voltage when compared to ESL lamp types, and there are differences in the use of electric power from various types of lighting in
the market, where lights This type of LED uses less electric power to produce lighting power when compared to ESL lamp types.

4 Conclusion

Based on the results of the research obtained, it shows that there are differences in power measured by power on the pen lamp label circulating in the market, where the type of LED lamp has label power difference with a measured power usage of 9.88% and ESL lamp types having a difference of 18.88%. The average LED light is capable of producing better lighting power when compared to ESL lamp types. LED lights are also more flexible in receiving lower voltage sources when compared to ESL lamp types. LED type lights use smaller electric power to produce lighting power when compared to ESL lamp types.

References


The Effect of Using Fuel Type on Exhaust Gas Emission of K3VE Gasoline Engine Whith Compression Ratio 11:1

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Abstract. This study aims to determine the effect of using fuel types (premium, pertalite, and pertamax) on the composition of the exhaust gas engine K3VE with a compression ratio of 11:1. The independent variables in this study are (1) premium fuel with the value of Research Octane Number (RON) 88, pertalite with the value RON 90, and pertamax with the value of RON 92. The dependent variable of this research are the composition of the exhaust gas. The data in this study were obtained from testing the use of each fuel on the K3VE gasoline engine with a gas analyzer at the Unimed Engineering Faculty of Automotive Engineering Laboratory. Testing for each type of fuel is carried out six times. Test results of the data using each type of fuel are analyzed: (1) descriptively; and (2) different tests using the Mann-Whitney Test. The results obtained show (1) the use of premium fuels, pertalite and pertamax produce CO mean consecutive: 0.02%, 0.01% and 0%; HC mean: 124 ppm, 81.2 ppm and 17.3 ppm; CO₂ mean 14%, 13.1% and 13.1% respectively; (2) There are significant differences between the average premium CO, pertalite, pertamax and HC premium, pertalite and pertamax, the lowest is for the use of pertamax.

Keywords: Premium, pertalite; petamax; exhaust gas emissions.

1 Introduction

Fuel is an important factor in vehicles, the use of this type of fuel needs to be adjusted to the design technology and specifications of the vehicle engine. For a gasoline motor, one of the determinants is the size of the compression ratio. Comparison of compression is a comparison of the volume of space above the piston when the piston is at the Below Dead Centre (BDC) with space above the piston when the piston is at the Top Dead Centre (TDC). For gasoline engines in general the compression ratio ranges from 7:1 to 12:1 depending on the type of vehicle or design from the manufacturer. The cars that have been produced lately, the compression ratio tends to be made high with the aim of increasing efficiency (fuel economical), and reducing the level of exhaust emissions. Consequently a high compression ratio in order to obtain a combustion process that produces optimum performance, must use fuel with the appropriate Research Octane Number (RON).

The higher the compression ratio of a vehicle requires high RON fuel. RON is a number that shows how much maximum pressure can be given inside the combustion chamber before the gasoline burns spontaneously. Inside the combustion chamber, a mixture of gasoline and air can burn itself spontaneously before being exposed to a spark from the spark plug, this is
an undesirable condition. The higher the number of RON gasoline, the longer the gasoline burns spontaneously. This spontaneous combustion causes a knock inside the machine which is commonly referred to knocking symptoms. The occurrence of spontaneous combustion is not desirable because combustion occurs not as designed by the manufacturer. Spontaneous combustion in addition will reduce vehicle performance, damage engine components and produce high emissions of pollutant gases including CO, HC, CO2 and NOx (Toyota Astra Motor, 2008). Therefore, it is recommended that the use of fuel must be adjusted to the engine specifications, especially the compression ratio of the engine. In Indonesia, Pertamina has provided several alternative fuel choices for gasoline vehicle, among others: premium with RON 88 which is the cheapest price, pertalite with RON 90, pertamax with RON 92 and pertamax turbo with RON 95. Higher octane value of fuel, price more expensive.

K3VE machines in Indonesia include vehicles that have many users. This car has a compression ratio of 11:1, fuel system Electronic Fuel Injection (EFI), ignition system, Electronic Spark Edvancer (ESA), and valve opening system Variable Valve Timing Intelligence (VVTi). The operation of the above systems is regulated by the Electronic Control Unit (ECU) and uses Catalyc Converter to neutralize exhaust emissions.

Cars with a compression ratio of 11:1 are designed to use fuel with RON 92, in Indonesia, namely pertamax (http://www.ridergalau.com/maupilih-premium-pertlite-pertamax-pertamax-plus. Accessed on May 15, 2017), but the reality is there are still those who use premium fuel with RON 88 or pertalite with RON 90, considering the cheaper price of RON 92 fuel.

Based on the background stated above, the formulation of the problem of this research are: (1) What is the composition of the K3VE engine exhaust emissions with a compression ratio of 11:1 that uses premium fuel with RON 88; (2), pertalite with RON 90, and pertamax with RON 92. (2) Is there a difference in exhaust emissions between those using premium, pertalite and pertamax?

2 Methodology

Premium [3] is a clear yellowish distillate type fuel oil. Premium is one of the fuel for motorized vehicles in Indonesia. Premium in Indonesia is marketed by Pertamina at a relatively cheap price because of its low quality and obtaining subsidies from the Government. Premium is fuel oil with RON 88 (Indonesian Wikipedia, the free encyclopedia). Pertalite is the latest fuel from Pertamina with RON 90. Pertalite is produced by the addition of additives in the processing process at oil refineries. Pertalite was launched on July 24, 2015 as a new variant for consumers who want higher quality premium fuel oil, but at a lower price than Pertamax, this type of fuel is a mediator between Premium and Pertamax. To make Pertalite the composition of the material is nafta which has RON 65-70, so that the RON becomes RON 90 then mixed with HOMC (High Octane Mogas Component), HOMC can also be called Pertamax, mixing HOMC that has RON 92-95, but also added EcoSAVE additives. This EcoSAVE additive is not for increasing RON but for the engine to become finer, cleaner and more efficient (Indonesian Wikipedia, the free encyclopedia).

Pertamax is a Pertamina fuel oil product. Pertamax, like Premium, is a fuel oil product from petroleum processing. Pertamax is produced by the addition of additives in the processing process at oil refineries. Pertamax in Indonesia was first launched on December 10, 1999 as a Premix replacement and Super TT because MTBE elements are harmful to the...
environment. Pertamax is recommended for vehicles that have compression from 9.1 to 10.1, especially those that have used technology equivalent to Electronic Fuel Injection (EFI) and catalytic converters (Wikipedia, the free encyclopedia).

The K3VE engine is a 4-stroke gasoline engine with an Electronic Fuel Injection (EFI) fuel system, valve opening with intelligent Variable Valve Timing system (VVTi) and using a catalyst converter as a cleaner for exhaust emissions. This engine fuel system, ignition, valve opening and closing settings are regulated by the Electronic Control Unit (ECU). ECU functions to receive signals from various sensors and process them by trying to compare them with the optimal values that already exist in the ECU program, then instruct the actuator to work. The actuator in the EFI system is an injector that sprays fuel with the duration according to the ECU calculation, while the ignition system is an igniter that regulates the appearance of ignition on the spark plug (Toyota Astra Motor, 2008).

The EFI system chart on gasoline engines is generally shown in Figure 1.

In the EFI system, fuel is supplied to each injector after ECU calculates the duration of fuel injection based on signals from sensors. The sensors are: water flow meter or manifold pressure sensor, K3VE machine including type L EFI uses air flow meter, this sensor detects the air mass that will enter the combustion chamber; crankshaft position sensor, detects the crankshaft angle and engine speed; camshaft position sensor, detects the standard camshaft timing angle; water temperature sensor, detects coolant temperature; throttle position sensor, detects the opening angle of the throttle valve; and oxygen sensor, detecting oxygen concentration in the exhaust gas. Thus the duration of the fuel injection sprayed by the injector into the combustion chamber is adjusted to the condition of the engine received by the ECU based on engine working conditions.

To get performance and exhaust gas with low emissions, the fuel injected into the combustion chamber must be burned at the right time by the ignition system. The K3VE engine uses an Electronic Spark Advancer Direct Ignition System (DIS). In general, the chart of the ESA ignition system is shown in Figure 2.
The chart shows that ignition with ESA is done after the ECU receives signals from sensor. Knock sensor signals the ECU if there is knocking. Knocking can occur when the fuel burns not as desired. Knocking shows that the occurrence of incomplete combustion will cause a decrease in performance and exhaust emissions that contain high pollutants. This condition can be caused by improper use of fuel, including machines with a high compression ratio but using low RON fuel. This is quite influential if the vehicle using conventional ignition, but needs to be tested to what extent the role of the ECU is able to calculate sensor signals, especially knock sensors so that the ECU can adjust the IGT ignition signal to igniter so that combustion that occurs in the combustion chamber does not deviate from the desired.

The combustion process in the cylinder is expected and will produce optimum performance and low exhaust emissions when combustion occurs as shown in Figure 3.

In the picture, point A is when the initial ignition matches the specifications of the vehicle and B starts burning fuel and the air in the cylinder, the A-B is called the ignition delay period. Point C is the maximum combustion. To get optimal performance, point C must be attempted to occur at 10 ° after TDC. If point C is before or after 10 ° TDC, the vehicle's performance will decrease and exhaust gas emissions will contain high pollutants.
The results of combustion [4] of fuel and air in the combustion chamber will produce exhaust gas which consists of: (1) Hydrocarbons (HC), namely toxic particles from fuels that are not partially burned or burned. HC can cause respiratory problems, help form ozone, and is a major component in smog. The composition of HC can be suppressed by giving heat and oxygen outside the combustion chamber so that it reacts to Carbondiosida and water; (2) Carbon monoxide (CO), which is a gas that can be deadly, colorless and odorless, when inhaled it dissolves in the blood so it can reduce the ability to carry oxygen in the bloodstream. CO can be converted into CO2 with the help of a little oxygen and heat; (3) Nitrogen oxide (NOx) is produced by nitrogen and oxygen in mixed air and fuel. NOx occurs when the combustion chamber temperature rises more than 1800 °C. The higher the combustion temperature the higher the NOx. NOx can cause photochemical smog and if inhaled it can cause irritation to the nose and throat; (4) Carbon dioxide (CO2), which is a relatively harmless gas, CO2 concentration indicates the combustion process in the combustion chamber. If the Air Fuel Ratio (AFR) is in the ideal number, CO2 ranges from 12% to 15%.

If the AFR is too rich or too thin, CO2 will drop, this gas emission is thought to cause global warming “greenhouse” effect. To control environmental health related to exhaust emissions of motorized vehicles, the Republic Indonesia Minister of Environment Regulation No. 5 of 2006 concerning the threshold for exhaust emissions of old motorized vehicles as shown in Table 1 (Republic of Indonesia Environmental Regulation No. 5 of emissions of old motor vehicles.)

<table>
<thead>
<tr>
<th>Table 1. Exhaust Gas Emission Threshold the Gasoline Vehicle</th>
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<td>Gasoline</td>
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One of the efforts made by motor vehicle manufacturers to reduce environmental pollution due to exhaust gas, in vehicles paired with catalytic converters. Catalytic converter is a component that functions to convert harmful exhaust gases, especially CO, HC and NOx gases into harmless gases into H2O, CO2 and N2 so that the exhaust gas that comes out becomes cleaner than pollutants. The hypothesis of this study is: The use of fuel with RON that is lower than the specifications will result in exhaust emissions with higher pollutant levels (CO, HC, and CO2) than using fuel with RON according to specifications.

This study aims to determine the effect of using fuel types (premium, pertalite, and pertamax) on the composition of the exhaust gas engine K3VE with a compression ratio of 11:1. This experimental research study examined the effect of the use of fuel types on exhaust emissions on the K3VE gasoline engine. The design of this study is shown in Table 2.

<table>
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<th>Table 2. Research Design</th>
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<td>Fuel Type</td>
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This research was conducted at the Automotive Engineering Laboratory Faculty of Engineering Unimed on Willem Iskandar Pasar V Medan Estate in October 2018.

As the object of this research is the K3VE gasoline engine exhaust gas which uses premium, pertalite and pertamax fuels.
Independent variable this are (1) Type of fuel, which is premium with RON 88, pertalite with RON 90 and pertamax with RON 92. Dependent variables in this study is the composition of exhaust emissions (CO, HC, CO2, and O2).

The data obtained were analyzed by: (1) descriptive for each treatment (type of fuel); (2) Mean difference test using the Mann-Whitney Test.

3 Result and Discussion

Tests are carried out on the same vehicle, the K3VE gasoline engine with different fuels, that is:

The first test, the vehicle filled with premium fuel, then tested the composition of the exhaust gas six times.

The second test, the fuel tank is drained and then filled with pertalite fuel, then run as far as ± 10 km so that the previous premium fuel which is still in the fuel line runs out, then resets on the ECU and runs again for ± 10 km then takes measurements of emissions exhaust gas as the first test six times.

The third test, the fuel tank is drained and then filled with pertamax fuel, then run as far as ± 10 km, then reset the ECU and run again for ± 10 km and then measure the composition of the exhaust gas six times.

Data on exhaust emissions is obtained through measurement with a gas analyzer for each fuel. From the measurement results, data were obtained from CO, HC, CO2, O, λ, and AFR.

Based on the results of testing of the use of each fuel is known that CO gas produced by the use of premium, pertalite, and pertamax is obtained a mean value of 0.02%, 0.01% and 0.00%, HC values with 125 ppm, 81.4 ppm and 17.4 ppm respectively. CO2 with an average value of 13.4%, 13.2%, and 13.1%, respectively. Pollutant values from the use of fuel above, all are still below the threshold specified in the Republic of Indonesia Regulation of the Living Environment No. 5 of 2006 concerning the threshold for exhaust emissions of old motor vehicles in Indonesia.

Hypothesis test results show that there is a significant difference between CO gas produced by the use of premium fuel with pertalite and pertamax, pertalite with pertamax, where the highest CO levels are those using mean premium = 0.02 and pertamax = 0.00

The HC element shows that there is a significant difference between HC elements produced by the use of premium fuel with pertalite and pertamax, pertalite with pertamax, where the highest HC content is premium Mean = 124 ppm and the lowest use pertamax Mean = 17.3.

The CO2 gas element shows no difference between those using premium, pertalite and pertamax fuels. The highest CO2 content is produced by premium use.

The test results showed that CO gas produced by the use of premium fuel was the highest, namely 0.02, then pertalite 0.01 and pertamax 0.00. CO gas is a polluting gas that can interfere with human health, because if inhaled it can react in the blood and inhibit the flow of oxygen in the blood. The value produced by the use of the three types of fuel above is still below the threshold, but it is better to use pertamax fuel which produces CO zero%.

The HC test results show that the use of premium fuel produces the highest HC, which is Mean of 124 ppm, pertalite an Mean of 81.2 ppm and pertamax Mean 17.3 ppm.

Hydrocarbons (HC) [5], which are toxic particles from fuels that are not partially burned or burned. HC can cause respiratory problems, help form ozone, and is a major component in
smog. Although this value is still below the permissible threshold, it is 150 ppm, but it is better to use pertamax fuel which only produces an average HC of 17.3 ppm.

The K3VE gasoline engine is a vehicle where the fuel system, ignition and valve opening are regulated by the Electronic Control Unit (ECU) and the catalyst converter has been installed. The results above show that the ECU has not been able to regulate when ignition and combustion in the cylinder which results in perfect combustion especially in premium use. It is known that the HC element which is large from the use of premium means that there are still many elements of fuel that are not burned. In addition, it is suspected that the catalytic converter has played a role in neutralizing pollutant emissions, but has not been able to neutralize exhaust emissions to the lowest level, especially in the use of premium fuel.

From the test results it is known that each fuel is burned with Air Fuel Ratio (AFR) = 14.6 with an average value of premium λ 0.994, pertalite 0.995, and pertamax 0.999. The value of λ is the value of the air ratio used for combustion compared to theoretical air. Theoretical λ value = 1. This result shows that the near perfect mixture of air and fuel occurs when using pertamax fuel, namely AFR = 0.999.

4 Conclusion

Based on the test results, it can be concluded as follows:

a. The use of fuel with RON lower than the recommended RON specifications will result in higher exhaust emissions with pollutants (CO and HC).

b. The use of fuel with lower RON than RON specification affects AFR, the mixture tends to be thin.

c. There are significant differences in CO exhaust emissions from the use of premium, pertalite and pertamax fuels. The Mean CO gas produced by the use of premium, pertalite, and pertamax fuels, respectively 0.02%, 0.01%, and 0.0%.

d. There is a significant difference in HC emissions from the use of premium, pertalite and pertamax fuels. The Mean HC value produced by the use of premium, pertalite, and pertamax fuels, respectively 124 ppm, 81.2, ppm and 17.3 ppm.

e. The use of fuel with a lower RON than the RON specification will produce exhaust gas with higher pollutants.

f. The ECU has not been able to manipulate the use of RON fuel under the specifications of the RON for perfect combustion.

g. The Catalyc converter on the gasoline engine K3VE is thought to have functioned to neutralize exhaust emissions, but not optimal in the use of fuel with RON lower than the specifications.

References


[5] Republic Indonesia Minister of Environmental Regulation No. 5 of 2006 concerning the threshold for exhaust emissions of old motor vehicles.)
Analysis of Needs to Basic Competence for Building Construction Workers

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Abstract. Construction workers are people who are directly involved in the construction of a building. Construction workers generally do not have competence in the construction field. This happens because workers in the construction sector generally have a general education background. The purpose of this study is to analyze the basic competencies needed by construction workers. The research sample consisted of 45 construction workers in Medan. The instrument used was in the form of an assessment sheet with rating scale questionnaires. The data analysis was carried out using a descriptive and qualitative method. The results show: 1) The instrument’s suitability test gives the average value of Aiken’s V 0.87; 2) Construction workers need training to improve competence; 3) Basic skills needed by construction workers are: K3 implementation, material testing, equipment use, plastering work, tile/cramping installation, and mold installation. Tools and module are needed to improve the basic competencies of construction workers in the city of Medan.

Keywords: Basic competencies, construction workers, analysis of needs

1 Introduction

Construction work is an activity related to the construction of infrastructure or civil buildings [1]. The quality of construction workers plays an important role in achieving the goals and quality of buildings (projects). For that, construction workers need not have a higher education, but a specific competence or skill is necessary.

The policy on ASEAN economic community (MEA) has been implemented so that the formal job market is increasingly competitive [2]. The field of construction work requires high competitiveness, one of the conditions is the legality of education, which has an impact on the field of construction work in the city of Medan. Medan city statistical data shows the population with lower education than high school reached 32.23%. The population of Medan is 2.5 million, with productive workers working in the informal sector at 57.50%. The results of interviews with several contractors (building construction companies) in the city of Medan, stated that most of the workers in the building construction field had the highest education in senior high school. Generally, these workers, do not have expertise in the field of building construction. This causes construction workers to be less competent in carrying out work.

Based on these data, a research is necessary to analyze what competencies are needed by informal sector workers who can compete in the construction world. Construction work is a whole or part of a series of planning and/or implementation activities along with supervision that includes the respective architectural, civil, mechanical, electrical, environmental

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management work, and their completeness to realize a building or other physical form. In general, competence in the field of construction expertise, especially in buildings consists of several fields of work: concrete stone construction, steel construction, wood construction, building drawings, furniture, and so on. [3] Nanang D.A’s research results (2010) stated that there were errors presented in presenting a building design, specifically for earthquake resistant buildings. The results of this study indicate that there is still a discrepancy between what is presented theoretically and what is done during the construction of a building. For this reason, efforts are needed so that a construction is constructed in accordance with the concept so that the building is in accordance with its function.

One area that absorbs a lot of labor in constructing a building is the construction of stone and concrete. The field of concrete stone expertise consists of a number of competencies: foundation installation, wall heating, stamping, floor work, finishing work, and others. The promising basic competencies in building construction are the finishing skill, for example, installation of ceramics, granite, natural stone, installation of molding, and wallpaper installation techniques. Workers skilled in finishing are still scarce in the job market. This will be the basis of this research: to provide basic competencies for building construction workers, especially in the field of finishing in concrete stone construction expertise. According to Caroline (2013), it is necessary to conduct basic competency training for students to improve competence before entering employment. Likewise, the basic competency training for building construction workers is expected to have an impact on increasing competency, competitiveness, and ultimately may improve the welfare of building construction workers. For this reason, it is necessary to plan an appropriate basic competency training for construction workers. This study emphasizes the analysis of the basic competencies needed by building construction workers.

2 Methodology

This research was conducted in the city of Medan. The research subjects were building construction workers, amounting to 45 people. This study aims to identify the basic competencies needed by construction workers in the field of building engineering. The data was obtained through an assessment sheet with a scale rating on basic competencies needed by construction workers. The validity test of the assessment sheet used is done with the Aiken’s formula approach. The objective of this research is to increase the competence of construction workers in the building sector. For this reason, it is necessary to develop a training module in the field of building construction, which is intended for construction workers. Module development was based on the study by [4]. Data analysis techniques were carried out with a qualitative descriptive method. The main indicators of each aspect were done using assistance factor analysis in SPSS.

3 Result and Discussion

The results of observations and interviews with stakeholders in the field of construction in Medan shows that: a) the workers in the building construction field had competencies that needed to be improved, b) there are several types of competencies/skills needed by construction workers to make a building: foundation installation, wall installation, plastering,
floor work, kozen installation work, door and window hanging work, ceiling installation work, roof installation work, sanitary installation work, and finishing work. Furthermore, from the results of the interviews, the most needed skills by workers is the expertise in concrete stonework. In addition, in carrying out the construction work, workers pay little attention to the occupational health and safety (OHS). This can be seen from construction workers who generally do not use the personal protective equipment (PPE) while working, such as not using shoes and hats. Moreover, the workplace does not provide the necessary aid and equipment.

The stages of analysis are: performance analysis and need analysis. Performance analysis is done to find out and identify whether the performance problems faced by workers require problem-solving in the form of training or management improvement. The implementation of construction work in the building sector has experienced problems, such as low skills/competency of workers, which results in the low performance of individuals in completing work. Improving the quality of knowledge and skills of workers needs to be done because of the low competency of construction workers in entering the building construction work. Therefore, it is necessary to conduct a needs analysis that is to determine the capabilities/competencies that need to be trained for workers to improve performance which has implications for increasing competence.

Needs analysis is carried out through an assessment sheet to stakeholders (users) of building construction, in this case, educators, practitioners, and instructors. The dissemination of this assessment sheet aims to obtain data on the need for the competence of construction workers. This assessment focused on the types of skills most needed by construction workers, especially in the field of concrete stonework. [5][6] suggest students should be equipped with basic competencies needed according to market needs. This is also necessary for students in the field of building construction. Workers in the field of building construction generally have a general education background, thus requiring training in basic competencies in the construction field. To find out the basic competencies needed by construction workers, an instrument was developed in the form of an assessment sheet. The assessment sheet was developed consisting of 47 questions with 6 aspects. Each question uses a Likert scale.

The results of the needs training data analysis are based on the assessment sheet using Aiken’s formula. The results of the analysis are presented in Table 1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Rated aspect</th>
<th>Number of items</th>
<th>V Aiken's</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Healthy safety work</td>
<td>9</td>
<td>0.906</td>
<td>Valid</td>
</tr>
<tr>
<td>2</td>
<td>Inspection of building materials</td>
<td>12</td>
<td>0.906</td>
<td>Valid</td>
</tr>
<tr>
<td>3</td>
<td>Concrete Stone Work Tools</td>
<td>13</td>
<td>0.888</td>
<td>Valid</td>
</tr>
<tr>
<td>4</td>
<td>Plastering Work</td>
<td>5</td>
<td>0.877</td>
<td>Valid</td>
</tr>
<tr>
<td>5</td>
<td>Tile and Ceramic Installation</td>
<td>3</td>
<td>0.890</td>
<td>Valid</td>
</tr>
<tr>
<td>6</td>
<td>Molding Techniques</td>
<td>5</td>
<td>0.900</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>Summary</td>
<td>47</td>
<td>0.870</td>
<td>Valid</td>
</tr>
</tbody>
</table>

Based on the results in Table 1, the average value of V Aiken’s is 0.870. The results of V Aiken’s value analysis are at 0.870> 0.600 so it can be stated that the assessment sheet developed is in the valid category. This shows that, based on the data provided by construction workers, they really need training in all six aspects to be able to improve their knowledge and competence in the field of building construction. The 6 aspects needed by construction workers include: 1) Occupational Safety Health, 2) Building Material Inspection, 3) Concrete

Furthermore, based on the data provided, the average needs of construction workers for each aspect of concrete stonework are presented in Table 2.

<table>
<thead>
<tr>
<th>No</th>
<th>Rated aspect</th>
<th>Average</th>
<th>Percent.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Healthy safety work</td>
<td>4,622</td>
<td>92,44%</td>
<td>Very Needed</td>
</tr>
<tr>
<td>2</td>
<td>Inspection of building materials</td>
<td>4,550</td>
<td>91,00%</td>
<td>Very Needed</td>
</tr>
<tr>
<td>3</td>
<td>Concrete Stone Work Tools</td>
<td>4,508</td>
<td>90,15%</td>
<td>Very Needed</td>
</tr>
<tr>
<td>4</td>
<td>Plastering Work</td>
<td>4,560</td>
<td>91,20%</td>
<td>Very Needed</td>
</tr>
<tr>
<td>5</td>
<td>Tile and Ceramic Installation</td>
<td>4,600</td>
<td>92,00%</td>
<td>Very Needed</td>
</tr>
<tr>
<td>6</td>
<td>Molding Techniques</td>
<td>4,480</td>
<td>89,60%</td>
<td>Needed</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>4,553</strong></td>
<td><strong>91,07%</strong></td>
<td><strong>Very Needed</strong></td>
</tr>
</tbody>
</table>

Based on the results of the needs analysis in Table 2, it can be concluded that every aspect of the concrete stonework is needed by construction workers to be trained on an average score of 91.07 (indispensable category). This shows that construction workers are in desperate need of training in improving their skills or competencies at work.

Based on the analysis of factors regarding occupational health and safety (OHS), out of 9 questions are categorized into two main factors, with an eigenvalue of 80.49%. This means that two northern factors are able to explain 80.49% of the OHS. The first factor is formed by the indicators of tidying up the area and place of work as well as conducting first aid in case of accident. The second factor is formed by the indicator of the cause of the accident and the OHS law. The analysis result using factor analysis produces KMO and Bartlett's test values as Table 3.

Based on the results of calculations using SPSS, the KMO value is 0.854, while the sig value is 0.000 calculated using Bartlett's Test. This shows that occupational safety health is important to be trained in building construction workers. For the building materials test material, based on the factor analysis result, there are 2 main factors with eigenvalue of 69.57%, with details such as the following figure.

Fig. 1. Eigenvalue of Material Test

The first major factor is formed by the testing of aggregates (sand and gravel) and the removal of parts of the building, while the second main factor is formed by concrete testing. The KMO value is at 0.811 with a sig value of 0.000 from the results of Bartlett's test. This
shows that the testing of building materials, which includes aggregate testing, testing of parts of a building, and concrete testing is needed for construction workers.

<table>
<thead>
<tr>
<th>Tabel 3. Hasil KMO and Bartlett's Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.854</td>
</tr>
<tr>
<td>Bartlett's Test of Sphericity:</td>
</tr>
<tr>
<td>Approx. Chi-Square df Sig.</td>
</tr>
<tr>
<td>207.395 36 0.000</td>
</tr>
</tbody>
</table>

For the aspects of concrete stone work equipment, of the 13-equipment filled with construction workers, there are two main factors. The first factor is stone and strand equipment, while the second factor is tool and jointer with eigenvalue of 74.30%, KMO value of 0.762, and sig value of 0.000. Therefore, training for the use of equipment is also important to be given to construction workers, especially the use of concrete stone equipment, the use of strand, the use of concrete and jointer tools. In addition, the main factor that needs to be trained for the implementation of the plasterwork is how to install tiles and make concrete molds. Those are some of the basic competencies needed by construction workers, especially building construction, based on the results of the analysis.

4 Conclusion

The results of the analysis show that: 1) construction workers have low skills and the competency needs to be increased, especially in the field of concrete work, 2) the results of the instrument test gives an average value of Aiken's V of 0.870, indicating that workers are in need of training to improve their skills/competencies. 3) the skills most needed by construction workers are: tidying up areas and workplaces, accidents aid, testing of aggregates (sand and gravel), testing of building construction parts, testing of concrete, use of equipment (strings, stone chisels), execution of plastering, tile/cramping installation, and concrete mold making.

References

Development of Physics Learning Media Based on Website with Problem-Based Learning Model

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Abstract. This study aims to develop a web-based physics learning media with the Problem Based Learning (PBL) model in the Basic Physics course I and to find out how effective the web-based learning media are with the Problem Based Learning model in Basic Physics I. This research is a Research and Development with a development model from Borg & Gall. The results of the material validator were 80.5% of the content quality, aspects of material language usage 83%, the visual appearance of material 85%, Sound Aspects of the Material 83%, Ease of use of material 90%, 84% Problem-Based Learning Model with eligibility criteria 84, 3%. The assessment category is "very feasible", this means that website-based physics learning media with the Problem Based Learning model are by the learning material and are suitable for use in learning. The results of the media validator are 86% media effectiveness and efficiency, reliable from the media 83%, Media content is 87%, Ease of media use is 85%, Accuracy of 85% authoring tools, Media compatibility 83%, Media Integration 85%, Media documentation 82%, Media consistency 80%, with media eligibility criteria of 84%. The assessment category is "very feasible", product trials include small groups and field trials on Problem Bases Learning-based website learning media obtained that the learning media is feasible to use with details of the results of small group trials conducted obtained at 86%. Based on the results of field trials conducted obtained by 89%. It means that the website-based physics learning media with the Problem Based Learning model is by the learning media and is suitable for use in learning.

Keywords: Problem-based learning, media feasibility, website learning media

1 Introduction

The rapidly developing information technology is currently not separated from the size of internet users. According to survey results carried out by the Indonesian Internet Service Providers Association (APJII), the number of internet users in Indonesia reached 143.26 million from the total population of 262 million. This figure increased by 7.96% from 2016 which was recorded at 132.7 million people. Internet technology enables learning media that can interact with two or more directions online. Based on the above data the use of the internet can be used to develop learning activities in schools, universities or tutoring because of the use of interactive internet learning media that can reach various countries [1]

Progress in the field of information and communication technology (ICT) enables the development of online learning resources. Mills [2] states that the Source of Online Learning enables the learning process to be able to achieve the form of "complex skills" needed in the global era while at the same time enabling the Student-centered learning. Fullick [3] mentions
"in student-centred classroom the goal of education is independent creation, autonomous learners who assume the responsibility for their learning”.

Integrating information technology into the learning process can improve literacy, building on the characteristics of a knowledge-based society in students, while increasing the effectiveness and efficiency of the learning process itself [4]. Web-based learning media that is supported by a database is one alternative that can be used as an effective alternative method. This web-based learning media consists of learning material, audio, and learning evaluation [5]. Web-based learning media or e-learning is now becoming popular because of its flexibility and effectiveness is a way of delivering learning material through the internet that can be accessed anytime and from anywhere [6]. Students can use the website as a means to get physics material whenever and wherever students need or as a medium of discussion or practice. In the development of e-learning websites/systems it is mostly used by educational institutions where, "Overseas like in the US, e-learning has been used in almost 90% of universities that have more than 10,000 students” [7].

There are three types of internet learning systems that are used as references in the development of learning media using the internet; the first web course is the use of the internet in the learning process where all teaching materials, discussions, consultations, assignments, exercises and examinations are carried out using the internet. The second web-centric course is the use of the internet in the learning process in which all activities are carried out with internet media but at a particular time are held face-to-face to discuss between lecturers and students. The third web-enhanced course, known as the web lite course, is the teaching and learning process that prioritises direct face-to-face classes, the function of the internet here is to provide enrichment and a place of communication between lecturers and students or between students and students with other learning resources [8]. Therefore, the lecturers are required to master literacy techniques, create teaching materials, and learning media through the web to generate interest in student learning. Mastery of concepts and problem-solving abilities in physics learning as one aspect in evaluating the achievement of student learning outcomes in order to achieve effectively and quality learning can be used internet / website-based learning media. Through website-based learning media, students can learn independently and actively by accessing websites. The use of the website is expected to facilitate students in understanding the physics material that is abstract; students can repeat the lesson by accessing the website and students can also practice the skills in answering questions by completing the practice questions on the website prepared by the lecturer.

Problem-Based Learning Model is a model of learning that requires students to develop skills of thinking, problem-solving and intellectual skills, fostering skills inability to cooperate, and developing social attitudes. Learning with the Problem Based Learning model is expected to provide opportunities for students (students) to be able to improve scientific work skills.

Based on the results of observations so far, the learning process in basic physics courses I, some lecturers still use print media or printed books in conducting the learning process, so that lecturers do not maximise time in delivering learning material. In order to improve the quality standards of graduates and improve curriculum in physics majors regularly and periodically evaluate and develop programs such as the implementation of lectures, results achieved and material presented whether it is still efficient, effective and relevant to market demands.

The teaching and learning process in the physics department needs to take advantage of information technology advances by presenting website-based learning media easily accessible from the hands. Especially for Physics education practitioners. Physics as one of the
subjects that most people find demanding needs to be presented creatively and follows a lifestyle (lifestyle).

Therefore, it is crucial to design a website-based physical learning media using the Problem Based Learning model, especially in basic physics courses I, so that the learning process becomes effective and efficient by market demands and the creation of competent graduates.

The development of website-based learning media has been done a lot like what has been done, among others by Arsi in high school on dynamic electricity subject matter, obtained results of 91.35% with good categories and the resulting media are feasible [9]. Development of web-based physics learning media to improve Adherence Quotient is deemed feasible [10]. The development of web-based E-learning conducted by Iful in 2015 with a 4D model obtained by web-based media is feasible [11]. The development of website-based learning media with the Discovery Learning Guide approach conducted by Sherly also states that it is feasible to use [12]. Development of a web-based Blended Learning Media enhanced Course, active can foster an interest in learning physics by 65% [13].

The development of web-based learning media for natural science subjects for class VII students conducted by Januarman dan Ghufron using Wordpress CMS is feasible as a learning media based on media validation and material experts [6]. Development of web-based learning media to measure results student learning on primary network computer subjects computer and network engineering expertise programs conducted by Heni and Hary using the ADDIE development model obtained an average test of 88.55% stating that this media is feasible [14].

The development of website-based learning for generation Z conducted by Bambang, Dewiyani and Pantjawati using Google Apps For Education (GAFe) states that it can improve learning outcomes and be feasible to use [15]. The development of web-based media and e-learning in physics material in senior high schools conducted by Saraswati produces web-based learning media in physics subjects in high schools is feasible [16]. The development of homework-oriented webs on physics subjects conducted by Demirci shows that homework performance increases significantly [17]. Research conducted by Ridha and Nurman in the use of blogs in the geographic information system course stated that there was an increase in student learning outcomes when using blogs as a learning medium [18].

The development of problem-based technology-based learning media in general only emphasises technology and ignores Problem-based learning research itself, especially the learning mechanism related to problem-solving [19]. The use of problem-based learning models based on websites is more effective than Content-based learning, where students have a more positive response to increased knowledge by using website-based problem-based learning models [20].

2 Methodology

The research method used in this study is Research and Development/Research and Development (R & D). The R & D model that will be used in this study refers to a design developed by Borg & Gall [21], 1) Research and information collecting, 2) Planning, 3) Develop preliminary form of product, 4) Preliminary field testing, 5) Main product revision, 6) Main field testing, 7) Operational product revision, 8) Operational field testing, 9) Final product revision, 10) Dissemination and implementation, and limited to part seven of ten in
this study the part is due to the seven steps that have been able to answer the research problem. The procedure carried out in this study is as shown figure 1.

![Fig. 1. Design developed by Borg & Gall](image)

Media validation is a process to assess whether web product design with problem-based learning (PBL) model has been categorized as an effective and efficient website in increasing students' interest in learning. In the validation stage, the initial product design was consulted to the Expert team consisting of material experts and media experts.

After material experts and media experts validate product design, we can find out the weaknesses or shortcomings of website-based learning media with the problem-based learning model. These weaknesses are improved to produce better and more effective products. Product testing is an important part of development research carried out after the product design is complete. For product testing carried out using small group tests and field trials

After the product is validated by material and media experts and has been tested in small groups and field trials, the weaknesses of the product can be identified. The weakness is then corrected to produce a better product.

### 3 Result and Discussion

This research was conducted at the Physics Department of Medan State University. The distribution of questionnaires and small group trials were carried out to students of the 2017 Physics Education Study Program, while the large group trials were conducted for students of the 2018 Physics Education Study Program.

#### 3.1 Research and Information Collecting

The results of the observation of the need for media from this study is the need for interactive learning media that can be used anywhere and supported by a problem-based learning model. It is also expected that with this learning media the learning process will be more effective and can improve learning outcomes.
3.2 Planning

After the next observation process is to collect the required data including the needs of the lecturer and students on the learning media needed. Based on the results of the analysis obtained that lecturers need interactive website-based physics learning media that can be combined with the Problem Based Learning model in basic Physics courses.

3.3 Develop a Preliminary Form of Product

Some things are done in product design Media-based learning of Physics Website with the Model of Problem Based Learning. The design of this media product is to find a suitable idea for PBL, determine the material to be displayed, Determine the web system that will be created including material (teaching materials), images, videos and animations, and determine the hosting and the suitable domain. This follows the display of Website Design.

3.4 Preliminary Field Testing

After the product has been designed, the next step is to validate the feasibility of the media. The validation of media feasibility was carried out by six experts consisting of 3 material experts and three media experts. The criteria in determining the validator are experienced in their field and have a minimum of S2 education. The results of the validation of material experts and media experts are as follows:

3.4.1 Material Validation

The results of the material validation of the Website-Based Learning Media with the Problem Based Learning Model in the Basic Physics course as shown in the table below.

<table>
<thead>
<tr>
<th>No</th>
<th>Assessment Aspect</th>
<th>Feasibility Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality of Material Content</td>
<td>80.5%</td>
</tr>
<tr>
<td>2</td>
<td>Language aspects</td>
<td>83%</td>
</tr>
<tr>
<td>3</td>
<td>Visual Display</td>
<td>85%</td>
</tr>
<tr>
<td>4</td>
<td>Sound Aspects of the Material</td>
<td>83%</td>
</tr>
</tbody>
</table>
### 3.4.2 Validation of Media Experts

The results of the media expert validation from the Website-Based Physics Learning Media with Problem-Based Learning Model in the basic physics subject can be seen as in the table below.

<table>
<thead>
<tr>
<th>No</th>
<th>Assessment Aspect</th>
<th>Feasibility Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>User Ease</td>
<td>90%</td>
</tr>
<tr>
<td>6</td>
<td>Model of Problem Based Learning</td>
<td>84%</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>84%</td>
</tr>
</tbody>
</table>

### 3.4.3 Main Product Revision

After a website-based physics learning media with a problem-based learning model is validated, the next step is to make improvements. The results of improvements to the design of instructional media are explained as follows:

a. Results of Material Material Validation Improvement

The results of the improvement of material expert validation on the development of website-based physics learning media with the Problem Based Learning Model in basic physics courses are as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Criticism and suggestions</th>
<th>Corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>More physics simulations need to be</td>
<td>Physics simulation has been added</td>
</tr>
<tr>
<td></td>
<td>added</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Need to add an explanation using images</td>
<td>An explanation has been added using images</td>
</tr>
</tbody>
</table>

b. Results of Improving Media Expert Validation

The results of the improvement of media expert validation on the development of website-based physics learning media with the Problem Based Learning model in basic Physics courses are as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Criticism and suggestions</th>
<th>Corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The use of colour must be more</td>
<td>Already done repairs by the advice</td>
</tr>
<tr>
<td></td>
<td>varied</td>
<td>of the validator</td>
</tr>
<tr>
<td>2</td>
<td>Physics simulations need to be</td>
<td>Already done repairs by the advice</td>
</tr>
<tr>
<td></td>
<td>improved again</td>
<td>of the validator</td>
</tr>
</tbody>
</table>
Criticism and suggestions

<table>
<thead>
<tr>
<th>No</th>
<th>Criticism and suggestions</th>
<th>Corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>The simulation must be more interactive</td>
<td>Already done repairs by the advice of the validator</td>
</tr>
<tr>
<td>4</td>
<td>Add videos</td>
<td>Already done repairs by the advice of the validator</td>
</tr>
</tbody>
</table>

3.4.4 Main Field Testing

In this small group trial carried out by ten students who had attended basic physics courses at Medan State University can look like the table below.

Table 5. Small Group Trial Results

<table>
<thead>
<tr>
<th>No</th>
<th>Assessment Aspect</th>
<th>Feasibility Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Increase student knowledge</td>
<td>86%</td>
</tr>
<tr>
<td>2</td>
<td>Ease of use</td>
<td>78%</td>
</tr>
<tr>
<td>3</td>
<td>Increase student interest</td>
<td>86%</td>
</tr>
<tr>
<td>4</td>
<td>The ease of starting the program</td>
<td>84%</td>
</tr>
<tr>
<td>5</td>
<td>Clarity of instructions for use</td>
<td>86%</td>
</tr>
<tr>
<td>6</td>
<td>Use of language</td>
<td>90%</td>
</tr>
<tr>
<td>7</td>
<td>Usage of letters</td>
<td>86%</td>
</tr>
<tr>
<td>8</td>
<td>Use of colour</td>
<td>84%</td>
</tr>
<tr>
<td>9</td>
<td>Use of images</td>
<td>88%</td>
</tr>
<tr>
<td>10</td>
<td>Use of illustrations</td>
<td>88%</td>
</tr>
<tr>
<td>11</td>
<td>Use of sound</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>86%</strong></td>
</tr>
</tbody>
</table>

Based on the results of the small group experiment, the effects of Problem Bases Learning were obtained by a percentage of 83%, the assessment of learning media gained an average percentage of 87%, and a small group assessment of the technical design of website-based learning media was 86%. From this, it can be concluded that the average percentage assessment of small group trials is 86%. Field trials were carried out for 2018 class B physics class students who followed physics courses as seen in the table below.

Table 6. Field Trial Results

<table>
<thead>
<tr>
<th>No</th>
<th>Assessment Aspect</th>
<th>Feasibility Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Increase student knowledge</td>
<td>95,00%</td>
</tr>
<tr>
<td>2</td>
<td>Ease of use</td>
<td>83,33%</td>
</tr>
<tr>
<td>3</td>
<td>Increase student interest</td>
<td>95,00%</td>
</tr>
<tr>
<td>4</td>
<td>The ease of starting the program</td>
<td>83,33%</td>
</tr>
<tr>
<td>5</td>
<td>Clarity of instructions for use</td>
<td>88,33%</td>
</tr>
<tr>
<td>6</td>
<td>Use of language</td>
<td>90,83%</td>
</tr>
<tr>
<td>7</td>
<td>Usage of letters</td>
<td>91,67%</td>
</tr>
<tr>
<td>8</td>
<td>Use of color</td>
<td>90,83%</td>
</tr>
<tr>
<td>9</td>
<td>Use of images</td>
<td>89,17%</td>
</tr>
<tr>
<td>10</td>
<td>Use of illustrations</td>
<td>89,17%</td>
</tr>
<tr>
<td>11</td>
<td>Use of sound</td>
<td>80,83%</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>89%</strong></td>
</tr>
</tbody>
</table>

Based on the field experiments conducted, the effects of Problem Bases Learning were obtained by a percentage of 91.11%, the assessment of learning media gained an average percentage of 87.50%, and a small group assessment of the technical design of website-based learning media was 88%. From this, it can be concluded that the average percentage assessment of small group trials was obtained at 89%.
4 Conclusion

The initial planning of designing a website-based physics learning media with a problem-based learning model is to create learning media that can make the learning process more effective and efficient. In the process of designing learning media, the initial stage is to find ideas, analyse the material displayed, determine the web system that will be created. At this stage, the web system used by using WordPress is added to moodle in the exam process. Use of the domain used is e-learning.teguhfebrin.com with hosting a capacity of 10 GB. These website-based physics learning media is expected to help the teaching and learning process in basic physics courses.

Based on the assessment and analysis of material experts, it was declared valid. Please note that in the expert validation stage the material has been carried out several stages of improvement so that the average percentage is very satisfying.

The results of the material validator were 80.5% of the content quality, aspects of material language usage 83%, the visual appearance of material 85%, Sound Aspects of the Material 83%, Ease of use of material 90%, 84% Problem-Based Learning Model with eligibility criteria 84, 3%. The assessment category is "very decent", this means that the website-based physics learning media with the Problem Based Learning model is by the learning material and are suitable for use in learning.

Based on the assessment and analysis of media experts, it is declared valid. Please note that in the media expert test phase several stages of improvement have been carried out so that the average percentage score is very satisfying. The results of the media validator are 86% media effectiveness and efficiency, 83% of media reliability, 87% media, 85% ease of use, 85% accuracy of authoring tools, 83% media compatibility, 85% media integration, media documentation 82 %, Media Consistency is 80%, with criteria for media eligibility of 84%. The assessment category is "very feasible", this means that the website-based physics learning media with the Problem Based Learning model is compatible with the learning media and are suitable for use in learning.

Product trials include small groups and field trials on Problem Based Learning-based website learning media obtained that the learning media is feasible to use with the details of the results of small group trials conducted obtained by the effects of Problem-Based Learning in a percentage of 83%, assessment of learning media gained the average percentage is 87%, and the small group assessment of the technical design of website-based learning media is 86%. From here it can be concluded that the average percentage of small group trial evaluations was 86%. Based on the field experiments conducted, the effects of Problem Bases Learning were obtained by a percentage of 91.11%, the assessment of learning media gained an average percentage of 87.50%, and a small group assessment of the technical design of website-based learning media was 88%. From this, it can be concluded that the average percentage assessment of small group trials was obtained at 89%.

References


Development of the Experimental Food Book as a Research Guide for Food and Nutrition Student

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Department of Family Welfare Education, Faculty of Engineering, Universitas Negeri Medan, Medan, Indonesia 1

Abstract. Product development is an essential activity in the food industry and it is a required competency of food and nutrition student. The objective of the study was to develop the experimental food book as a research guide for food and nutrition student. The study used research and development method with 4D (define, design, develop and dissemination) research model was conducted from May to October 2018 in Medan City. The experimental food book has been designed according to the food and nutrition students need and validated by food and nutrition, educational and media experts. The book consists of the early presentation of necessary information on methods, planning, and evaluation for those who will be doing food experimental. Moreover, how to report the results. The food experimental food could be used as a research guide for food and nutrition student.

Keywords: Experimental, food, guidebook, nutrition

1 Introduction

Indonesia still faces nutritional problems that have a severe impact on the quality of human resources [1], [2]. In Indonesia, 30.8% of under-five children suffer from stunting and 10.2% wasting [3]. Moreover, the prevalence rate of anemia among pregnant women is 48.9% [3] that can increase risk of significant low birth weight (LBW) delivery [4], [5].

The most common efforts for meeting nutrient requirement of under-five children and pregnant women include dietary diversification and selection of nutrient-rich foods, supplementation with multivitamins and mineral, fortification of staple foods, and use of fortified food product specially designed for this target group [6]–[9]. Many aspects must be considered in developing a new food product. To meet the goals, we need to pay attention to the characteristics of food ingredients, nutrient content, availability of raw materials, processing, sensory characteristics, safety, storage, cost, and acceptability.

Product development is an essential activity in the food industry, and it is a required competency of food and nutrition student. The objective of the study was to develop the experimental food book as a research guide for food and nutrition student.
2 Methodology

The study was conducted from May to October 2018 in Medan City used to research and development method with 4D (define, design, develop and disseminate) research model. Define (needs analysis) aims to collect information in the field for the development of products through initial analysis; the student needs assessment, material analysis, and goal setting. The design process was carried out by interviews with lecturers and literature studies. Furthermore, the development phase aims to produce the final product after going through the process of validation, revision, and pilot test. The design results are validated by nutrition, educational, and media experts. Expert validation results are revised. The dissemination stage is the last stage in the development of the 4D model to promote products.

3 Result and Discussion

The experimental food book is a research guide that is expected to be used primarily by food and nutrition students. Moreover, the book was made as an effort to improve nutritional problems by improving the food consumed [6]–[9].

3.1 Experimental Food Book Material Identification

Identification of the experimental food book material was carried out by collecting several books and other references related to food experiments. It is called define stage of the 4-D model. Furthermore, the material was arranged based on the stages of food experiments from the introduction to analyzing the data and present the reports. Some similar research used the method as an initial stage of teaching media development [10], [11].

The experimental food book discussed the things needed for designing food with a scientific approach to food problems such as food preparation and storage, nutrient content, and how to develop new food products. The literature review reference of experimental food book present in Table 1. Some journals related to food experiment [12]–[16] were studied to enrich the book literature.

<table>
<thead>
<tr>
<th>No</th>
<th>Title</th>
<th>Author(s)/Editor(s)</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A handbook for Sensory and Consumer-Driven New Product Development</td>
<td>Maurice G. O’Sullivan</td>
<td>2017</td>
</tr>
<tr>
<td>2</td>
<td>Accelerating New Food Product Design and Development, 2nd Edition</td>
<td>Jacqueline H. Beckley; Leslie j. Herzog; Michele Foley</td>
<td>2017</td>
</tr>
<tr>
<td>3</td>
<td>An Integrated Approach to New Food Product Development</td>
<td>Howard R. Moskowitz; I. Sam Saguy; Tim Straus</td>
<td>2009</td>
</tr>
<tr>
<td>4</td>
<td>Descriptive Analysis in Sensory Evaluation</td>
<td>Sarah E. Kemp; Joanne Hort; Tracey Hollowood</td>
<td>2018</td>
</tr>
<tr>
<td>5</td>
<td>Developing New Functional Food and Nutraceutical Products</td>
<td>Debasis Bagchi’ Sreejayan Nair</td>
<td>2017</td>
</tr>
<tr>
<td>6</td>
<td>Experimental Food Science, 3rd Edition</td>
<td>Marjorie P. Penfield; Ada Marie Campbell</td>
<td>1990</td>
</tr>
</tbody>
</table>
3.2 Designing the Experimental Food Book

The next stage after preparing food experiment book material was designing a book from the cover, table of contents, contents of the book and closing. Chapter 1 is an explanation and principles of food experiments and ending with suggestion practice. Chapter 2 and 3 presents information about development a new food product and aspects to be considered related to food science such as the effect of processing on nutrients. Chapter 4 tries to answer the demands due to globalization in the economic field to the development of new products, including generating ideas and realizing them.

Chapter 5 presents product optimization techniques specifically for nutritional parameters and costs both manually and computerized. Chapter 6 and 7 discuss the food evaluation by objective and sensory methods. Food product must have a good quality, attractive flavor and appearance, balanced and safety nutritional content. The last chapter showed how to present the food experimental reports.

The experiment food science has two main objectives, namely to present the scientific basis for understanding the nature of food and to promote the principles of the food experiment methodology. The food experiment studies are concerned with why foods are handled, processed, and prepared as they are, how and why variations in ingredients or treatment influence the food quality, and how this knowledge can be used to improve the food products quality.

4 Conclusion

The experimental food book has been designed according to the food and nutrition students need and validated by food and nutrition, educational and media experts. The book consists of the early presentation of necessary information on methods, planning, and evaluation for those who will be doing food experimental. Moreover, how to report the results. The food experimental food could be used as a research guide for food and nutrition student.
References

Effect of Direct Instructional Model, Problem Solving, and Attitude on Lay Up Shoot Learning Outcomes in Basketball Games

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Abstract. The research was carried out Private Vocational High School (SMK) Raksana 2 Medan. The stages of this study including collecting data on attitudes, applying treatment of learning models, and collecting data on the results of shoot lay up learning in basketball games. Implementation of the learning model treatment by direct learning and problem solving. The time for applying the treatment of the learning model (direct learning and problem solving) was carried out for 4 weeks. With the time of the study as many as 4 meetings. The study was conducted using the experimental method. This study was to compare two different learning models, namely the direct learning model and problem solving with attitude attribute variables of students, which consisted of high attitude and low attitudes.

Keywords: Learning models, attitudes, basketball

1 Introduction

Physical education is one of the subjects in school which is a driving force for the development of motor skills, physical abilities, knowledge, sportsmanship, habituation of healthy lifestyles and character formation (mental, emotional, spiritual and social) in order to achieve the goals of the National education system.

Physical sports and health education are one subject given at a particular school level which is one part of the overall education that prioritizes physical activity and fostering a healthy life for growth and harmonious, harmonious and balanced physical, mental, social and emotional development.

Physical education is part of a general education program that contributes, especially through motion experience, to the overall growth and development of children. Physical education is defined as education and through movement and must be carried out in appropriate ways to have meaning for the child. Physical education is a learning program that provides proportional and adequate attention to the learning domains, namely psychomotor, cognitive, and affective.

So far there has been a tendency to give meaning to the quality of education which is only associated with aspects of cognitive ability. This view has brought about the neglect of aspects of moral, morality, character, psychomotor and art. In the implementation of sports and health physical education in schools still tend to use the concept of traditional learning approaches. This means that the concept still emphasizes the mastery of basic techniques and is oriented
towards the technical skills of playing various sports (sport-based division). The learning process does not forget the development of students' ability to understand the nature of the game itself.

The increasing of movement skills, physical fitness, knowledge, and positive attitudes towards physical education are largely determined by a good curriculum. The curriculum itself seems too abstraction to be concretely and clearly defined because in the curriculum includes everything planned and applied by the teachers, both implicitly and explicitly. One of the materials included in the physical education curriculum is basketball which is included in the big ball category.

Basketball sports were first introduced in the United States in 1891 from a physical training school (Youth Men's Christian Association). Initially basketball was intended as a recreational activity, with few rules and regulations. A century later the sport has been played and enjoyed by people throughout the world. Basketball is a sports game played by 2 teams. Each team consists of 5 players and each tries to put the ball into the basket to score and prevent the opponent from scoring.

According to Imam [1] Basketball sports is a game of sports that uses large balls, played by hand. The ball can be passed, thrown to a friend, or may be reflected on the floor in place or while walking. The goal is to put the ball into the opponent's basket. The game is carried out by two teams, each of which consists of five players, each team tries to put the ball into the opponent's basket or make a number and keep or prevent the ball itself from entering the basket in basketball games the ball is pushed over, shifted, thrown, rolled, reflected or dribbled in all directions according to the rules or provisions of the International Basketball Ball Association (FIBA) Federation. Basketball games are complex games that consist of combining elements of motion that are well coordinated.

One interesting side of basketball games is the shoot up technique. Technically Shoot lay-up is one of the basic techniques of basketball games that must be mastered by a basketball player. Seen when a player is in a playing field, they often do lay-up techniques. Lay-up shots are alternative shots that are often used by basketball players to get as many scores as possible, these shots tend to be more effective in breaking through the opponent's defense.

There are several techniques used to insert balls into baskets, including lay shoot techniques. In this study the basic technique used was the lay up shoot. Lay up shoot is a shot that is preceded by a two-step movement accompanied by a continued movement of placing the ball into the ring [1]. According to [2] a lay up shoot shot is a shot that is done close to the basket after dribbling the ball. The circuit includes the movement of holding the ball, running or stepping forward, jumping and firing at the opponent's ring to score.

Techniques are not as easy as they seem. Many students are often confused when combining footwork and firing shots at the opponent's ring. Even though one technique produces a lot of numbers when a team does a fast break. Nowadays lay-up shoots are increasingly varied, the elements that need to be considered in lay-up shoot techniques are several types, including footsteps, hand-out and jumps. To master this technique, routine training and hard work are needed. Students are accustomed to starting by training the movement towards the opponent's basketball hoop without dribbling.

Once you are good at managing footwork, continue moving while dribbling the ball. Don't forget, practice the ability of both hands to practice this technique. Due to the difficult technique students are required to master the lay up shoot technique through physical education at school. Physical education has complex or comprehensive nature, not only focused on psychomotor learning (skills), but also includes several aspects such as, affective
aspects (attitudes) and cognitive aspects (knowledge). With physical education, children are directed to learn from these three aspects, so that in the learning process the child gets results. It is expected that behavioral changes will occur, not only physically but also intellectually, emotionally and morally in physical education learning.

However, the reality of the lay up shoot in the field of basketball games has not matched the objectives of the learning objectives in grade XI students of SMK Raksana 2 Medan. Where in several observations carried out that there were several problems including: In grade XI of SMK Raksana 2 Medan where there were more girls than boys, and this was a problem that really appeared in physical education learning. Where female students showed lower motivation in learning physical education, this was seen when students did change clothes, line up, warm up and the material delivered.

The implementation of lay-up shoot material on basketball games was also not well implemented. This was because the facilities and infrastructure were limited, then the learning concept was indeed less attractive, as well as the use of methods / models / strategies / learning styles that were still considered monotonous in physical education learning.

When students did a lay-up shoot, where the movement of the lay-up shoot was still a problem where students' cognitive reasoning about the lay-up shoot movement was still very minimal.

If analyzed during basketball lay-up shoot learning, the teacher did not stimulate students' cognitive. So the teacher only focused on psychomotor and results. While other things like cognitive and affective were ignored. This was seen from the lack of teachers providing knowledge and stimulus on how to process the lay up shoot scientifically.

The value of mid even semester of 2017/2018 academic years showed that many students who did not pass the Minimum Score Criteria (KKM) on Basic Competence (KD) 3 were the game of lay up shoot material. And this reinforced the problem that would be raised by the researcher.

The above problem was a concrete matter that was obtained by researchers through observation / observation for 3 x. Based on the above problems, the researcher conducted treatment 2 learning models namely direct learning model (direct instruction) and problem solving.

The direct learning model is a learning model that emphasizes mastery of concepts and / or behavioral changes by prioritizing a deductive approach, with the following characteristics: (1) direct transformation and skills; (2) specific goal-oriented learning; (3) structured learning material; (4) a structured learning environment; and (5) structured by the teacher. The teacher acts as the conveyor of information, and in this case the teacher used a variety of appropriate media, such as films, tape recorder, picture, demonstration, and so on. Information conveyed can be in the form of procedural knowledge (i.e. knowledge of how to do something) or declarative knowledge, (ie knowledge of something can be facts, concepts, principles, or generalizations). Critics of using this model include that this model cannot be used at all times and not for all learning purposes and all students.

Direct learning model or direct instruction, also known as the term expository and learning strategies whole class teaching. Direct learning is a learning model consisting of teacher explanations about new concepts or skills for students. According to Arends [3] a learning model specifically designed to support student learning processes related to declarative knowledge and well-structured procedural knowledge, can be taught with a pattern of activities that are step by step by step.
The method of problem solving was the use of methods in learning activities by training students to deal with various problems both personal and individual problems or group problems to solve themselves or together.

Problem solving is the process of accepting challenges and efforts to solve them until they find a solution. According to [4] that the problem solving method was not only a method of teaching but also a method of thinking, because in problem solving can use other methods starting from looking for data to drawing conclusions.

The problem-solving method is a way of presenting lesson material by making the problem a starting point for discussion to be analyzed and synthesized in an effort to find solutions or answers by students. In line with the opinion above states that in the method of problem solving, subject matter is not limited to books but also comes from certain events in accordance with the applicable curriculum.

In the learning process not only related to the learning model or strategy, but psychological learning is quite influential in the learning process. For example, attitude. Attitude is the tendency of individual behavior patterns to do things in a certain way towards people, objects or ideas. Attitudes can be interpreted as a group of beliefs and feelings attached to a particular object and a tendency to act on the object in a certain way.

According to [5] "The attitude is a way of reacting to a stimulus, a tendency to react in a certain way to a stimulus or situation faced". According to [6] "Attitude is an internal symptom that has affective dimensions in the form of a tendency to react or respond in a relatively fixed way to the object of the person, both positively and negatively".

Based on the opinions above, it can be concluded that attitudes are a tendency to react and respond in a relatively fixed way to certain objects both positively and negatively. A positive attitude will give positive results to the activities carried out related to that attitude, whereas negative attitudes will have a negative impact on the results achieved from these activities.

The attitude according to [7] is an idea or feeling that someone might have about something as a result of past experience or as a result of imaginative likes and dislikes. Moreover, attitudes can change as often as we sometimes hear that a woman can change her mind. In physical education, we are concerned with students' attitudes towards physical education activity programs as well as individual activities in the program.

Based on the description of the problem above, the researcher conducted a study entitled "The Effect of Direct Learning Model, Problem Solving, and Attitude on Lay Up Shoot Learning Outcomes in Basketball Games for grade XI Students of SMK Raksana 2 Medan".

2 Methodology

The study was conducted using the experimental method. The experimental method was the research method used to look for the effect of certain treatments [8]. In this study was to compare two different learning models, namely the direct learning model and problem solving with attitudes of students as attribute variables which consisted of high attitude and low attitudes.
3 Result and Discussion

The research design used was by level 2 x 2 with three research variables, namely one dependent variable and two independent variables. As the dependent variable was the result of learning the lay-up shoot the basketball game and two independent variables were a learning model and students' attitudes.

Learning treatment variables were divided into two, namely the direct learning model (A1) and problem solving (A2). The variables that influence namely high attitudes (B1) and low attitudes (B2).

This research was conducted at SMK Raksana 2 Medan. The stages of this study including collecting data on attitudes, applying treatment of learning models, and collecting data on the results of lay up shoot in basketball games. Implementation of the learning model treatment (direct learning and problem solving). The time for applying the treatment of the learning model (direct learning and problem solving) was carried out for 4 weeks. With the time of the study as many as 4 meetings. The results were based on the sample in Table 1.

<table>
<thead>
<tr>
<th>Learning Model (A)</th>
<th>Attitude (B)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Learning (A1)</td>
<td>High (B1)</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Low (B2)</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

The treatment in this study was using model as the independent variable was the direct learning model and problem solving, and attitudes as independent variables moderator. Before the teacher / team taught lay up shoot material on basketball learning in each treatment class, the researcher first gave signs to the teacher / team relating to the steps taken in the implementation of teaching and learning.

The conditions created for these two treatment groups were tried equally, except using the learning model. The same treatment included competency standards, material, time (number of face to face) and semester. Giving treatment to the two groups mentioned above.

Based on the results of analysis of variance at the level of α = 0.05 then obtained $F_h > F_t$ which was $5 > 4.04$. So that overall conclusions can be drawn that there were differences in lay up shoot learning outcomes in basketball games between direct learning and problem solving models.

Then proceed with the tukey test in groups A1 and A2 where $Q_h = 4.5$ and $Q_t = 3.79$ and based on these results it can be concluded that there were differences in the results of lay up shoot learning in basketball games between direct learning models and problem solving.

While the second hypothesis testing showed an interaction. Based on the results of the analysis of variance at the level of α = 0.05 it was obtained $F_h > F_t$ which was $13.88 > 4.06$. So, it can be concluded overall that were the interaction between learning model with attitude towards lay up shoot learning outcomes in the game of basketball. This meant that this research was going well because there were interactions.
4 Conclusion

a. There are differences in lay up shoot learning outcomes in basketball games between direct learning and problem-solving models.

b. There is no interaction between learning model with attitudes toward lay up shoot learning outcomes in the game of basketball.

c. Students are taught problem solving with high attitudes better than students taught by direct learning model with low attitudes.

d. Students are taught with direct learning models with low attitudes better than students taught with problem solving with low attitudes.

References


Online and Face to Face Composition in the Various Types of Learning Style

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Abstract. The experiments have been conducted on electro technical teaching for ensuring the most suitable combination of online learning and face-to-face in blended learning on the certain type of learning style. There were 166 participants involved and scattered in five groups. The full online (OL) and full face to face (F2F) were control groups, and there were three combinations of online and face to face in different forms made, namely 25-75, 50-50, and 75-25 OL-F2F. The Learning Style Questionnaire and Electro technical Competencies Test were used in tracing the participants’ learning styles and testing their competence. The 2-Way Anova, Sig. 0,05 shown the group of theorist and pragmatist learning style were better learned by the same OL-F2F composition, while the activist and reflector style were by the 75-25 and 25-75 of OL-F2F composition respectively.

Keywords: Online, face to face, learning style

1 Introduction

The optimal learning outcomes are the main goals in all of the learning activities, therefore it always be chosen the most suitable approach [1]. Based on their implementation, the learning form can be distinguished in three approaches. The first one is the online learning, which is the fully utilizing information and communication technology [2][1][4]. The second is the face-to-face learning, which is commonly called the traditional learning[5]. The third is the combination of the online and face to face, which is called the blended learning [6][7]. It’s stated the online learning has the superiority because the learners can learn individually anywhere, anytime and offers immediate access to specific information [8];[2];[10];[11].

In general, the students have diverse backgrounds, so their characteristics are also different in speed and strength in learning. In the other side, the face to face learning is also superior in the specific fields especially in mentoring for the weak students [12]. The teacher plays a more active role in this learning. Based on their advantage and disadvantage, combining the two of them can become a promising form because the traditional learning can be supported by web based on-line approaches. It has been stated that one way to integrate is to make computer-mediated and face to face learning activities overlap in time [3]. The media and the tools are employed in an e-learning environment with a number of pedagogic approaches, and irrespective of the learning technology used[14]. It is possible to provide several benefits including to increase the perception and discipline on the learning[15][16], to form the learning autonomy through involvement in deep learning [17]. The chance to collaborate are open, so who are the weaker can get help from those who are more skilled [4].
As well as the resources utilized and the important problems from institutions can also to be overcome [5];[20]. The organically technologies integrated in this learning, can complement the face-to-face approach through online methods. So the delivery, the teaching models the learning styles play an important role in these learning environments [6]. Providing the wider students’ discussion opportunities in increasing the students’ understanding can be done by making the different learning approach [7]; [8];[24]. It can also enhance the learning motivation and satisfaction which have a positive impact on the learning outcomes [9]; [10];[27];[28];[11]

So far It was claimed that the learning outcomes can be obtained well through the blended learning [12];[31];[32], but there is only a few explanations of the learning styles types different role and the most suitable composition of the online and face-to-face learning in the blended learning. Although the learning style different is recommended not to be disseminated [13], but based on daily experience, it is very important to consider when doing learning so that it can provide more optimal results, especially to use a particular learning approach. The learning style type is divided into four types, namely activist, theorist, pragmatist, and reflector [34];[14], and the combination of the online and face-to-face learning is impossible made according to the needs [15]. The combination of blended forms with the certain types of learning styles that are most appropriate, is important to consider the learning approach needed, and to develop the certain intellectual level [37], and the different learning process [16]; [17];[40]. Thus the obstacles between the learning process in class, on campus, and network-based learning are eliminated, and the conditions of optimal learning experience can be formed [41]. In this paper we will describe the appropriate combination of online and face-to-face learning on electrotechnical blended learning, for different types of the learners learning styles.

2 Methodology

2.1. Electrotechnical Competence in Blended Learning

The knowledges, skills, and the other internal factors of individuals related in doing work, called competencies, are the main objective of the learning and training activities [42][18]. To be competent in the field of electrotechnics must understand the engineering sciences, engineering analysis and investigation, engineering design, and engineering practice [44]. Some complex things are learned in this case, so for these purpose, the dynamic models is required to form the understanding specific competencies, and critical reflections of the learner [45]. The learning that gives instructor and the learner the opportunity to interact during the learning process, is needed to form the positive student perceptions toward learning, the better processes and environment, and the information literacy components [46];[19];[20]. Also the cognitive control, cognitive style, learning style, initial ability of students, and the type of model chosen in learning to guarantee the success of learning, is important to be considered [21].

Combining the two separate paradigms, namely classrooms-synchronous, and online-asynchronous is named as blended learning [22], which integrate and plan pedagogically the online and face-to-face learning. The part of the time of face-to-face activities can be replaced by online activities [23]. The combination of the two of them is impossible to acomodate the varities of learning characteristics [24]. In other word, the learning can be done in the classroom and at a distance, or using a mixture of different pedagogical strategies by (a)
combining various pedagogical approaches such as constructivism, behaviorism, cognitive learning approaches to produce optimal learning outcomes with or without the use of instructional technology; (b) combining forms of instructional technology and web-based training with face to face where programming is led by instructors; and (c) mixing or combining instructional technology with actual work tasks to create a harmonious effect on learning and work (Gil and Garcia in [25]). The internet becomes a place for online learning, and instructional medium, which is incorporated into the learning media by integrating several delivery modalities both synchronous and asynchronous [54]. It is described that the learning, the media, and the instructional environments are the elements of the component unity of blended learning [26].

The synchronous and asynchronous learning, with their advantages and disadvantages, are included in the learning environment. The interaction between the teacher and the learner that occurs through face-to-face, is called a synchronous form, and the acronym is through online. The specific positive attributes of each environment are intended to ensure optimal use of resources in achieving the instructional goals and the learning goals. The media is needed as a tool to deliver content, which is possible in various forms with the different uses. This is becaused of no single media is inherently better or worse than others [27]. With the media, the instructors and the students are possible to continue for establishing the communication both directly and indirectly.

The shipping media used does not change the desired content because sometimes the presentation of learning that is offline can be managed through an online learning system [28]. This is intended to support the achievement of learning objectives so that the most appropriate learning strategy is chosen. Strategy is a product of learning objectives, namely to serve, ensure learning goals, and facilitate learning transfer. The synchronous teaching form is applied to traditional classes, virtual classrooms, direct product practice laboratories, interactive chatrooms and mentoring [29]. Live classroom and traditional classes provide opportunities for teachers and students to meet face-to-face in the same place for complex, broad, program or new content, which requires face-to-face interaction, expert observation, cultural formation, networking, problem solving or material will be presented by the teacher [30].

The obstacles in planning of learning is overcome by understanding the teaching, adjusting the best media with performance goals, maintaining the interactive online provision, ensuring the participant commitment and following non-live elements, and ensuring all elements of the mix are coordinated [31]. So the flexibility of blended learning appear to become a transition from passive learning to active learning, where the focus of the class shifts from the presentation format to one of active learning. Then students are placed in situations that encourage them to read, speak, listen and think; To offer students an opportunity to be better together or individually; To bring together online and face-to-face class components, and mixing delivery systems, making it possible for students to learn by accessing material in various important modes because students often have different learning styles; To add a human touch to teach so that interactive content allows a high level of interest, accountability, and real judgment can be created; To increase individualization, personalization and relevance so that learners can adjust learning content to the unique needs of different students; and The best offer for students because teachers and students have greater flexibility and accessibility without sacrificing face-to-face contact.

This becomes an approach with effective and low-risk strategies and can meet the challenges of transformational change, where technological developments bring education to a better level (Hodgson in [32]). The composition of the right mix of online and face-to-face
learning on blended learning is possible to provide broad opportunities for better competency formation, which is based on the results of the analysis of curriculum content in developing the teaching materials used. The materials can be sorted based on the level of difficulty they have, to be packaged in learning with a variety of mixes between online and face to face.

2.2. Electrotechnical Competence in Blended Learning

The different backgrounds allow for the different learning characteristics, especially learning styles. The effectiveness of achieving learning objectives can be determined by the learning style[62];[33], which is distinguished as activist, theorist, pragmatist, and reflector [14]. They can be inventoried through real experience, reflective observation, abstract conceptualization, and active experimentation by testing their approach in learning situation [17]. Based on their respective characteristics, that the desire for practical tasks with very little theory, by emphasizing new experiences will be shown by a type of activist. Generally, focus on activities such as games, problem solving, simulation, lots of action and excitement. They can lead and be the center of attention, make ideas without worries about practical constraints, respond to challenges with certainty and take risks, and are happy with team problem solving [64].

While those who wish to rest a lot and travel, read and discuss, are the characteristics of the types of reflector. This type shows the best in activities where there are opportunities to observe and consider. There are strong elements of passive involvement such as listening to a speaker or watching a video to think before acting or contributing, opportunities for research, and problems can be investigated in depth by reviewing what is happening, and asked to make a report by carefully analyzing the situation or problem. Likewise the interaction with other people without the risk of feeling, come forward, and can complete a display without being under pressure [34].

The desire for leaflets to be studied was shown by a type of theorist. This illustrates that the most good learning for this type is from learning activities that form part of the conceptual whole, such as the model for theory, there is time to explore the interrelationships between elements, can explore the theories and methodologies underlying the subject being investigated, stretched intellectually, there are clear, clear objectives for activities, there is dependence on rationality and logic, can analyze situations and then generalize their findings, and they are asked to understand complex situations [35]. While the desire for shortcuts and tips is a characteristic of the pragmatic in learning, namely learning by activities where there is a clear link back to work-related problems. While the desire for shortcuts and tips is a hallmark of pragmatic learning, namely learning with activities where there is a clear link back to work-related problems, the material is directed to techniques that make their work easier to be able to practice what they have learn, and can relate to successful role models, and there are many opportunities to apply what has been learned [36]. The relevance is clear and learning is easily transferred to their work and what is done is practical such as compiling action plans or testing techniques or procedures [37]. It seems the differences that appear primarily in facing the learning situations can be accommodated through a variety of the possible combinations of online and face-to-face learning. The most appropriate and effective combination of online and face-to-face, for individual tasks and learning, will optimize the competency formation [16];[38].

2.3. Design and Participants

Our sample was taken as many as 166 participants who are placed in five classes of the electrotechnical course in Electrical Engineering Education Program of the State University of
Medan. Each of class are learned in the different approach namely Group 1 Online (OL), Group 2 Face to Face (F2F), Group 3 25/75 OL/F2F blended, Group 4 50/50 OL/F2F blended, and 75/25 OL/F2F blended, which envolved 35, 36, 33, 32 and 30 of participants respectively.

2.4. Tools and Materials

The learning materials was developed for five different approaches used which encompassed the relation between magnetism and electricity, the production of EMF and current, the faraday's law and electromagnetic induction, the direction of induced EMF and current, Lenz's Law, and the dynamically induced EMF. All of them were validated first by envolving three experts of learning design, electrotechnical teaching material, and instructional media respectively. The elearning facilitation of the electrical engineering education departments with the url addresed: http://jpte-ft-unimed.edu20.org was used in this experiment.

2.5. Data Collection Tools

There were two of data collection tools used in this research. The one was the Kolbs’ learning style questionnare in browsing the participants’ learning style type. And the two was the electrotechnical competency test instruments, which consisted of 30 items of objective test, 20 items of the structured essay tests, and 10 points of the skills assessment. The competency score is determined by combining the three measurements with the maximum measurement weight, each of which is objective test = 30, test essay 40, skill assessment 30.

2.6. Procedurs

Each of the learning group by involving the different teachers to conduct the experiment. All of the teacher was given the directions to equate perceptions about the implementation of the designed treatment. The learning was done in six time at the same time as learning takes place. The learning styles types of participants are traced using the learning style questionnaires available. And the electrotechnical competencies of all experimental groups were tested simultaneously at the end of the learning activity. The competency data of each group is validated, then sorted based on the group learning and the participant learning style type. Data were tested using 2-Way ANOVA at 5% significance level with the SPSS Program.

3 Result and Discussion

3.1 Results

The scores of electrotechnical competencies of all groups with blended learning were higher on average compared to the two groups of full online and full face to face (Table 1).

<table>
<thead>
<tr>
<th>Learnings</th>
<th>N</th>
<th>Mean</th>
<th>Std. Error</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Online</td>
<td>35</td>
<td>64.287</td>
<td>536</td>
<td>63.227 - 65.346</td>
</tr>
<tr>
<td>Full face to face</td>
<td>36</td>
<td>59.528</td>
<td>.518</td>
<td>58.505 - 60.551</td>
</tr>
<tr>
<td>25/75 OL-F2F</td>
<td>32</td>
<td>79.778</td>
<td>.549</td>
<td>78.693 - 80.862</td>
</tr>
<tr>
<td>50/50 OL-F2F</td>
<td>33</td>
<td>82.750</td>
<td>.558</td>
<td>81.646 - 83.854</td>
</tr>
<tr>
<td>75/25 OL-F2F</td>
<td>30</td>
<td>71.687</td>
<td>.572</td>
<td>70.557 - 72.816</td>
</tr>
</tbody>
</table>
It’s provides the highest competency int the same composition between online and face-to-face learning compared to other combinations, which is followed by a combination of 75-25 OL-F2F, and 25-75 OL-F2F. When viewed from the competency score based on the type of learning style (Table 2), it appears that the competencies of the pragmatic learning style type group are the highest compared to the other types, followed by activists, theorists, and reflectors.

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>N</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activist</td>
<td>41</td>
<td>72.978</td>
<td>.501</td>
<td>71.987</td>
<td>73.969</td>
</tr>
<tr>
<td>Theorist</td>
<td>42</td>
<td>69.611</td>
<td>.452</td>
<td>68.717</td>
<td>70.505</td>
</tr>
<tr>
<td>Pragmatist</td>
<td>44</td>
<td>75.778</td>
<td>.495</td>
<td>74.800</td>
<td>76.756</td>
</tr>
<tr>
<td>Reflector</td>
<td>39</td>
<td>68.056</td>
<td>.506</td>
<td>67.056</td>
<td>69.057</td>
</tr>
</tbody>
</table>

The average competency scores based on the learning style type group are varied (Table 3). The competencies of the activist types are higher in the combination of 75-25 OL-F2F, while the theorist and pragmatist types are mixed with the same composition OL and F2F, and the type of reflector in a blend of 25/75 OL-F2F.

<table>
<thead>
<tr>
<th>Learnings</th>
<th>Learning Style</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Online</td>
<td>Activist</td>
<td>6</td>
<td>74.17</td>
<td>3.764</td>
</tr>
<tr>
<td></td>
<td>Theorist</td>
<td>9</td>
<td>66.67</td>
<td>2.500</td>
</tr>
<tr>
<td></td>
<td>Pragmatist</td>
<td>9</td>
<td>62.22</td>
<td>2.635</td>
</tr>
<tr>
<td></td>
<td>Reflector</td>
<td>11</td>
<td>54.09</td>
<td>3.754</td>
</tr>
<tr>
<td>Full face to face</td>
<td>Activist</td>
<td>9</td>
<td>47.78</td>
<td>2.635</td>
</tr>
<tr>
<td></td>
<td>Theorist</td>
<td>10</td>
<td>57.00</td>
<td>2.582</td>
</tr>
<tr>
<td></td>
<td>Pragmatist</td>
<td>9</td>
<td>63.33</td>
<td>2.500</td>
</tr>
<tr>
<td></td>
<td>Reflector</td>
<td>8</td>
<td>70.00</td>
<td>3.780</td>
</tr>
<tr>
<td>25/75 OL-F2F</td>
<td>Activist</td>
<td>9</td>
<td>77.78</td>
<td>2.635</td>
</tr>
<tr>
<td></td>
<td>Theorist</td>
<td>10</td>
<td>70.50</td>
<td>3.689</td>
</tr>
<tr>
<td></td>
<td>Pragmatist</td>
<td>8</td>
<td>82.50</td>
<td>2.673</td>
</tr>
<tr>
<td></td>
<td>Reflector</td>
<td>6</td>
<td>88.33</td>
<td>2.582</td>
</tr>
<tr>
<td>50/50 OL-F2F</td>
<td>Activist</td>
<td>10</td>
<td>78.50</td>
<td>2.415</td>
</tr>
<tr>
<td></td>
<td>Theorist</td>
<td>9</td>
<td>86.67</td>
<td>2.500</td>
</tr>
<tr>
<td></td>
<td>Pragmatist</td>
<td>6</td>
<td>95.83</td>
<td>3.764</td>
</tr>
<tr>
<td></td>
<td>Reflector</td>
<td>7</td>
<td>70.00</td>
<td>4.082</td>
</tr>
<tr>
<td>75/25 OL-F2F</td>
<td>Activist</td>
<td>6</td>
<td>86.67</td>
<td>4.082</td>
</tr>
<tr>
<td></td>
<td>Theorist</td>
<td>9</td>
<td>67.22</td>
<td>2.635</td>
</tr>
<tr>
<td></td>
<td>Pragmatist</td>
<td>8</td>
<td>75.00</td>
<td>3.780</td>
</tr>
<tr>
<td></td>
<td>Reflector</td>
<td>7</td>
<td>57.86</td>
<td>2.673</td>
</tr>
</tbody>
</table>

It was found that both of the learning approaches and learning styles varieties influenced the competence significantly at the 0.05 level of significance. F = 336,900, Sig. ≤ 0.05 and F = 49.037, Sig. ≤ 0.05 (Table 4). The interaction between the various of blended learning and the learning styles types are also significantly affect the competence (F = 82.802; Sig. ≤ 0.05).
Based on the different tests in average scores of the competencies among all of the learning approaches groups showed the significant differences. It seems the reflector type is better taught through the combination of 25-75 OL-F2F in blended learning by comparing to the others combinations, and the 50-50 OL-F2F of combination provides the better competencies for both of the pragmatist and theorist type. Graphically It is drawn in Figure 1.

The activist types of learning style appear to be more appropriately taught by a combination of 75-25 OL-F2F, which is shown by the highest competence mean score.

### 3.2 Discussion

The results of this study further emphasize the importance of the right learning form in the various students’ backgrounds. The students’ competence based on the various learning forms and the learning styles types are diverse. The learning outcomes through online learning and face to face are significantly different. It is in line with the findings of Smith et al (2017) [39] that the results through online learning are higher on average compared to face to face. This is

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**Table 4. Tests of Learnings (Lrn) and Learning Style (LS) Effects**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>24050.226a</td>
<td>19</td>
<td>1265.801</td>
<td>132.069</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>821673.414</td>
<td>1</td>
<td>821673.414</td>
<td>85730.330</td>
<td>.000</td>
</tr>
<tr>
<td>Lrn</td>
<td>12915.942</td>
<td>4</td>
<td>3228.985</td>
<td>336.900</td>
<td>.000</td>
</tr>
<tr>
<td>LS</td>
<td>1409.979</td>
<td>3</td>
<td>469.993</td>
<td>49.037</td>
<td>.000</td>
</tr>
<tr>
<td>Lrn * LS</td>
<td>9523.335</td>
<td>12</td>
<td>793.611</td>
<td>82.802</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>1399.322</td>
<td>146</td>
<td>9.584</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>847975.000</td>
<td>166</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>25449.548</td>
<td>165</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .945 (Adjusted R Squared = .938)

![Figure 1. Graphics of Competence based on Learnings and Learning Styles](image_url)
possible because of the students can freely access teaching materials at unlimited times and places. This condition gave the wide range of learning opportunities which supported the students by these learning flexibilities. The online learning enables fellow the students to collaborate and interact well as stated by Horspool & Lange (2012) [40];[41];[42].

These are different from the findings of [43] who previously claimed that online and equivalent learning activities could be effective for students. These investigation found the groups’ competency taught through the blended learning is better than the scores taught by full online and face-to-face learning. This ensures that by combining the online and face-to-face learning provides the better results, which gives the understanding that the combination of the two of them can cover the weaknesses of each of them, in line with the findings of [44] in learning at u-Museum, and Wong, Pine, & Tsang (2000) [45] in training programs in the hospitality and tourism industry. The similar things were found by [46] on learning in Slovenian Universities which illustrate the variety of backgrounds of students can be overcome by integrating online learning with face-to-face. It can be accommodated as stated by [47], and the difficulties experienced by students in both approaches, online and face to face can be mutually covered as stated by [48].

Each of the activist, theorist, pragmatist, and reflector type has its own characteristics so they needed the different form of learning. The activists type turned out to be more prominent in dominant learning online. This is possible because of the person with an activist type prefers learning activities without the intervention of others. This type wants more practical tasks and very few theories as stated by [49]. The greater portion of online learning allows students to focus on the present and carry out activities such as games and problem solving. Likewise, the theorist type is characterized by the desire for leaflets to be studied, and the pragmatist type who wants shortcuts and tips, but the formation of competencies will be better if they are taught by a balanced combination of the online and face-to-face learning. This shows that both of them have in common that lack of learning can be fulfilled by teachers helps through face-to-face contact with teachers who teach as stated by [50]. While the reflector type tends to give better results when dominant face-to-face, with the characteristic that getting optimal results when accompanied by a lot of rest to go and read and discuss as stated by Rassool & Rawaf (2008) [51]. This finding is a refutation of the statement that learning styles are myths [13], because it is evident that different types of learning styles when taught with different approaches will provide more optimal results. Thus, learning styles are a real thing to consider in learning.

4 Conclusion

The diverse backgrounds, especially learning styles, are important to be considered in choosing the form of learning. The use of blended learning chosen in electrotechnical learning can provide maximum results when the portion between online learning and face to face is distinguished for each type of learning styles. As activists it is better to be given the freedom to learn through online, while reflectors need assistance through face to face. Theoretical and pragmatic types are better given balanced learning between online and face-to-face. However, this research is still limited to some of the competencies of students of the electrical engineering education program in Medan State University so that it still needs to be studied further in a wider scope and field.
References


Research on the Development of Teaching Materials of Micronutrient Metabolism based on KKNI Curriculum and Contextual Content

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Abstract. The Higher Education Curriculum oriented to the KKNI (Kerangka Kualifikasi Nasional Indonesia) is mandate for institution to make educators present professional learning to produce qualified graduates. Research on the development of teaching materials of Micronutrient Metabolism based on KKNI curriculum and contextual content has been done to improve the quality of learning in the Nutrition Study Program. Research and development method consist of initial analysis, development, validation and implementation (trial) was used in this research. Validation results based on the National Education Standards Agency (BSNP) showed that teaching material that has been developed was categorized as very feasible in content (3,39), language (3,50) and contextually based (3,50), while considered feasible in presentation (3,25).

Keywords: Teaching materials, micronutrient metabolism, KKNI, study program of nutrition, contextual

1 Introduction

The Indonesian National Qualification Framework Curriculum (KKNI) that have been regulated in Permenristekdikti stated, curriculum is a set of plans and adjustment about learning outcome, study material, process and evaluation that used as a guidance for High Education study program implementation. High Education Curriculum oriented to KKNI is an obligation for institution that must show spirit, earnestness and responsibility of an educator to perform professional education as a way to produce high quality alumnus.

Any forms of materials or materials that are arranged systematically to assist both teachers and instructor in implementing teaching and learning activities to establish good environment for students learning are called teaching material [1]. Book as one of teaching materials is a source of learning and plays an important role as a source of learning in classroom [2].

Contextual learning can be used to improve students understanding in basic concepts of courses. Contextual learning is a lesson that emphasizes the linkage between subject matter and daily life [3]. Contextual learning will introduce learning content using various active learning techniques designed to help students connect what they already know to what they expect in learning and build new knowledge from the analysis and synthesis of the learning.
process [4]. Contextual learning model consist of several components, constructivism, inquiry, questioning, learning community, modelling, reflection, and authentic assessment.

Micronutrient Metabolism is one of courses in study program of Nutrient. This course learn metabolism process of water soluble vitamin, fat soluble vitamin, macro mineral and micro mineral, and their effect to body health.

According to the description stated before, it is important to develop teaching material of micronutrient metabolism course.

2 Methodology

2.1 Location and Time of Research

This research was conducted in the study program of Nutrition, Department of Welfare Education, Faculty of Engineering, Universitas Negeri Medan, in July until October 2018.

2.2 Population and Sample of Research

Population in this study were (1) all textbooks, both print and electronic used as references in learning Micronutrient Metabolism in study programs of Nutrition, (2) lecturers of study program of Nutrition at the State University of Medan.

Sample selection was done using a purposive sampling technique, i.e. 3 student handbooks, both printed and electronic, which was used as a reference in the learning of micronutrient metabolism in study program of Nutrition, and 2 lecturers of study program of Nutrition at the State University of Medan.

2.3 Research Instrument

Research instrument used to collect data in this study were, first, analysis format of teaching material requirements according to curriculum content standard oriented KKNI and contextual based in study program of Nutrition at Micronutrient Metabolism course (Semester Learning Plan). Second, validation questionnaire of the feasibility of Micronutrient Metabolism teaching materials that has been developed based on the standards of the National Education Standards Agency (BSNP), consisting of content feasibility, language feasibility, feasibility of presentation with contextual approaches and KKNI-oriented.

2.4 Research Procedure

R&D (Research and Development) method that has been modified from [5][6] used in this study. The method consists of preliminary step (analysis), development, and the last evaluation of developed Micronutrient Metabolism textbook oriented KKNI and contextual based in study program of Nutrition.

2.5 Data Analysis

Feasibility analysis of developed teaching material according to BNSP criteria involving content feasibility aspect, language feasibility, presentation feasibility, and contextual based in agreement to KKNI oriented curriculum conducted descriptively correspondence to criteria of teaching material feasibility (Table 1).
3.26 – 4.00 : Very feasible (very valid)
2.40 – 3.25 : Feasible (valid)
1.76 – 2.39 : Less feasible (less valid)
1.00 – 1.75 : Unfeasible (not valid)

Source: Arikunto, 2002.

3 Result and Discussion

Validation result of developed Micronutrient Metabolism teaching material based on eligibility of content, language eligibility, feasibility presentation, and contextual based on KKNI oriented showed in Table 2.
### 2 Aspect of language eligibility

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. In accordance with the development of learners</td>
<td>3.75</td>
<td>Very feasible</td>
</tr>
<tr>
<td>b. Communicative</td>
<td>3</td>
<td>Feasible</td>
</tr>
<tr>
<td>c. Straightforward</td>
<td>3.25</td>
<td>Feasible</td>
</tr>
<tr>
<td>d. Coherence and sequence of thought lines</td>
<td>3.67</td>
<td>Very feasible</td>
</tr>
<tr>
<td>e. Compatibility with correct Indonesian rules</td>
<td>3.5</td>
<td>Very feasible</td>
</tr>
</tbody>
</table>

### 3 Aspect of feasibility presentation

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Presentation technique</td>
<td>3.21</td>
<td>Feasible</td>
</tr>
<tr>
<td>b. Supporting presentation</td>
<td>3.25</td>
<td>Feasible</td>
</tr>
<tr>
<td>c. Presentation of learning</td>
<td>3.30</td>
<td>Very feasible</td>
</tr>
</tbody>
</table>

### 4 Contextual based

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Contextual principle</td>
<td>3.5</td>
<td>Very feasible</td>
</tr>
<tr>
<td>b. Contextual characteristic</td>
<td>3.5</td>
<td>Very feasible</td>
</tr>
</tbody>
</table>

### 3.1 Eligibility of Content

The average value of eligibility of contents of developed teaching materials was 3.39 (very feasible). Teaching material that have been developed was very feasible in terms of material coverage according to KKNI, material accuracy, updates, stimulate curiosity and develop life skills.

Validation result of average feasibility of content depicted in Figure 1.

![Fig. 1. Average feasibility of content](image)

**Note:**
A: Material coverage according to KKNI  
B: Material accuracy  
C: Updates  
D: Stimulate curiosity  
E: Develop life skills

### 3.2 Language Feasibility

Validation result of average feasibility of language illustrated in Figure 2.
The average value of language eligibility of developed teaching materials was 3.50 (very feasible). Teaching material that have been developed was very feasible in terms of in accordance with the development of learners, communicative, straightforward, coherence and sequence of thought lines, and last compatibility with correct Indonesian rules aspect.

3.3 Feasibility of Present

The average feasibility value of present of developed teaching materials was 3.35 (feasible). Teaching material that have been developed was feasible in terms of presentation technique, supporting presentation, and presentation of learning. Average of feasibility of present showed in Figure 3.

Note:
A: Presentation technique
B: Supporting presentation
C: Presentation of learning

3.4 Contextual Based

Nilai rata-rata berbasis kontekstual bahan ajar Metabolisme Zat Gizi yan yang telah dikembangkan sebesar 3.50 (sangat layak). Bahan ajar yang telah dikembangkan sudah
berbasis kontekstual ditinjau dari hakikat kontekstual dan karakteristik kontekstual. Data penilaian rata-rata berbasis kontekstual dapat dilihat pada Gambar 4. The average feasibility value of present of contextual based was 3.50 (very feasible). Teaching material that have been developed was very feasible in terms of contextual principle and contextual characteristic. Average of feasibility of contextual based showed in Figure 4.

![Average of feasibility of contextual based](image)

**Fig. 4.** Average of feasibility of contextual based

Note:
A: Contextual principle
B: Contextual characteristic

[7] showed that students' performance who were taught using teaching material based on contextual development resulting experienced a higher increase of 25% compare with undeveloped teaching material. Finally, developed teaching material expected increasing impact of learning to student on Micronutrient Metabolism course in study program of Nutrient UNIMED.

## 4 Conclusion

Teaching material of Micronutrient Metabolism course in study program of Nutrient UNIMED that has been developed was categorized as very feasible in content (3.39), language (3.50) and contextually based (3.50), while considered feasible in presentation (3.25).

## References


Analysis of Resistance Factors Implementation KKNI Oriented Curriculum with Six’s Task at Electrical Engineering Department

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Abstract. KKNI Oriented curriculum implementation in teaching and learning activities in the Unimed developed with six's task student in the learning system. The success of the implementation of the six's tasks are not only from the resistance factors and support that can be derived from the students, lecturers and the availability of infrastructure facilities. The results of the study showed that the resistance factors faced by students is the availability of the ingredients and the appliance (58%), The clarity of the task of the lecturers (48%), feel less creative (49.4%). Resistance Factors from a lecturer is time to assess the task students (53%) and feel student motivation in performing tasks still low (76.4%). six's task implementation can be done better when the institution provides better soft copy or and hard copy reference. Such is the case of lecturers give the task more clearly and the number of credits to be interdicted proportional so enough time to assess the student tasks.

Keywords: Six’s task, resistance factors, support factors

1 Introduction

M Nasir (02-02/,2016) [1] said that in the era of MEA education we must produce resources that are able to compete because the competencies that can be made the standardized. The era of competition made them that have the competencies that will be so the winner. Based on this all universities must prepare their student to have competencies in accordance with the field of expertise.

One part of the implementation the curriculum is the tasks of the lecture who are assigned to the students. Lecturer, administrator and college must to support implementation new curriculum. Altrichter, H (2005), state that a new curriculum may be described as an attempt to change teaching and learning practices which will also include the transformation of some of the beliefs and understandings hitherto existent in the setting to be changed [2].

The perfection of the task that made students not escape from supporting factor and resistance factors in completing tasks that can occur from the students, lecturers these sycophants then courses and the availability of the infrastructure of education.

The curriculum based on the Indonesian National collage Standard articles 11 and 12 as a set of plan and purpose settings, contents and teaching materials and how that is used as the implementation guidelines to achieve the goal of higher education [3]. Curriculum as a plan, manifested in a series of courses and student activities. Standard reference in determining the ability of graduate competency from Indonesian research and technology ministry is the
framework of national qualification Indonesia (KKNI). KKNI arranged in the Regulation of the President of the Republic of Indonesia Number 8 Year 2012, constitution No 12 th 2012 and ministerial regulation no. 49 about SNPT 2014 [5][6][7].

KKNI aims to produce human resources from the teaching and learning process that is capable of producing the work and contribution of quality for the people of Indonesia. KKNI divided in nine (9) levels of qualification based on the mapping of a comprehensive employment conditions in Indonesia are reviewed from the income side (supply push) and users (demand pull) of labor [7] [8]. Schematically achievement of each level can be passed through formal education, non formal or work experience (UU 12 Th 2012 article 29)[5].

The implementation of the KKNI oriented curriculum in Unimed by six's task that are given on the students, which includes: routine tasks, critical book review, critical journal review, mini research, project task and engineering ideas. Based assessment 6 the task and added with a mid examination and final exams semester.

Six's task became the standard of teaching, learning activities and evaluation program in all departmen in the Unimed. Six's task ways to implementation KKNI curriculum and to reach university vision. Committee on a Conceptual Framework for New K-12 Science Education Standards (2012: 241) state that vision cannot be realized unless the standards permeate the education system and guide curriculum, instruction, teacher preparation and professional development, and student assessment [9].

So that students are expected to become more active and productive in the lecture for arrange scientific paper and pour the positive ideas the development of science and technology. So learning by experience which is based on a real life experience with the principles of learning to know, to do, to be and to live together.

2 Methodology

This research as a research policy evaluation with using survey methods. Sample research consist of 22 lecturer and 160 collage students. Data Collection by questionnaires and observation sheet instrument. Data analysis using descriptive statistics by SPSS 17th.[10].

3 Result and Discussion

The results of research on resistance factors faced by the students and lecturers in the implementation of the activities of the six (6) students’ tasks as shown in table 1 and 2.

<table>
<thead>
<tr>
<th>No</th>
<th>Resistance Factors</th>
<th>Prosentasi tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>just enough</td>
</tr>
<tr>
<td>1</td>
<td>the adequacy of the time</td>
<td>40,7%</td>
</tr>
<tr>
<td>2</td>
<td>availability of ingredients and the appliance</td>
<td>20,7%</td>
</tr>
<tr>
<td>3</td>
<td>clarity of tasks from Lecturers</td>
<td>7.3%</td>
</tr>
<tr>
<td>4</td>
<td>creativity of the students complete 6 Tasks</td>
<td>12%</td>
</tr>
<tr>
<td>5</td>
<td>achievement motivation</td>
<td>18%</td>
</tr>
</tbody>
</table>
Based on the results of the analysis of the data showed that the resistance factor that most of the students is the availability of the ingredients and the appliance (58% stated medium and low). The availability of reference materials is important because the task that the student work based on reference from the book, journals print and online, so that encourage students to think and act as a scientific basis in the academic climate scientific. supplying the source of this reference is important for good universities in the form of hand book, text books, scientific journals on line or hard copy.

The clarity of the task of the lecturers in providing the assignment as the theme or the main problem, clarity format, the collection of tasks can also be resistance factors, because 48% of students consider that the clarity of the task of the lecturers in the category of medium and low. The theme of the task and the format of the arrangement of tasks gives the direction of the student in completing the task so that when less clearly makes the difficult students in performing tasks. In addition, it can also undermine the student motivation in completing tasks become better and focused. It is important for lecturers to evaluate the tasks given how clearly level in the body/themes and format by asking the explanation from the students.

The availability of reference materials and laboratory facilities and the clarity of the 6 tasks can cause the creativity and student motivation in complete 6 tasks in the category of less (49.4%) and can cause creativity also in the category of less (48%). The same thing is also felt by the majority of lecturers (76.4%) stating that student motivation in performing tasks still low.

Resistance factors for lecturers who are considered big enough is to provide an assessment of the six’ task student (53%). This can be caused by the lecturers got the burden of teaching more than 9 credits and the number of students each class more than 30 students, besides when if the collection of student tasks scheduled on the days at the end of the first semester so that the tasks of students become accumulated from several classes and courses. Thus, the lecturer needs more time to assess the work of students and the time available frightened still less (53%).

The adequacy of the time preparing six's according to the lecturers and students in working on six's task is not the resistance factors because most states enough time to prepare planning lectures with six's tasks (40.7% very good and 14% enough for lecturers and students). Based on this lesson plan for the first semester that will walk can be made earlier so that the readiness of the lecturers in the lesson plan can do better.

4 Conclusion

Based on the results of research can be summarized as follows:

a. Resistance Factors implementation of 6 tasks according to the students is the availability of the ingredients and the appliance (58%), motivation achievement
(58%), the creativity of the students (49.4%), The clarity of the task (48%) and the adequacy of the time (45%).

b. Resistance Factors for lecturers in the implementation of the 6 tasks student is motivating students (73.6%), assess (53%), the needs of the time assess (53%).

c. Not many factors that inhibit for lecturers is the adequacy of the time in preparing for the six’s task students

References

The Impact of Adhesive Percentage Variation on Combustion Value of Durian Skin Biomass Waste

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\{\textsuperscript{*} sahalaall2002@yahoo.com \}

Department of Mechanical Engineering, Universitas Negeri Medan, Indonesia \textsuperscript{1}

Abstract. Development of Medan has an impact on the waste problem with durian skin significantly and certainly needs to resolve immediately. Innovation by technology development is used to process organic waste to become briquette is one of the ways to solve the waste problem with advantage economically as well as reducing unemployment. The technology built is durian skin chopper, rotary bio carbon machine and briquette press with pneumatic system and amount of tapioca adhesive in order to get effective burning promptness (gr/s). Briquette is made by mixing tapioca adhesive respectively 6 \%, 9 \%, 12 \% and 15 \% on durian skin biomass carbon in order to get maximum combustion rate (gr/s). The highest combustion rate is 5915 cal/gr (carbon powder is 34 gr and adhesive 6 \%) and the lowest combustion rate is 5611 cal/gr (carbon powder is 34 gr and adhesive 14 \%). The lowest adhesive value of variation is 6 \% with combustion rate is 0.2616 gr/menit while the highest adhesive value is 15 \% with combustion rate is 0.27744 gr/menit. The adhesive containing water will impact on combustion rate.

Keywords: Briquette, durian skin, adhesive, combustion value

1 Introduction

The increased consumption of oil and gas has impact on the increased price because both fuels are most used compared to the other fuel. The new sources are sought continuously. Biomass waste for example, is processed to be energy. It is suitable in Indonesia especially in North Sumatera because it is abundant as waste. Medan, capital of North Sumatera is the third biggest in Indonesia and also industrial and educational city. The growth of Medan has an impact on waste case, such as: durian skin. There are a lot of durian fruits since the durian is icon of Medan tourism. The durian skin waste should be managed promptly, otherwise it will cause environmental pollution and city aesthetics problem. Indonesia produces garbage waste 22.5 million ton and it is predicted to be increased up to 53.7 million ton in 2014 and 50.45 million ton in 2017 \cite{1}.

Overcoming waste problem (durian skin and sawdust) is processed to be new sources by means of a simple technology. Durian skin chopper, rotary bio carbon machine and briquette press with pneumatic system are built to process the waste to be briquette. The durian skin waste is mixed with amount of tapioca adhesive in order to get better combustion value. To optimize the combustion value of the briquette as good as LPG or kerosene, tapioca adhesive is added in variety amount. The durian skin contains 50 - 60 \% cellulose, 5 \% lignin and 5 \%
low starch. The durian skin contains high carbon and possible to make active carbon to use as adsorbent.

Biocarbon raw material is mashed up to 60 mesh (0.250 mm). The higher mesh value, the more solid briquette. Briquette adhesive uses tapioca 6 %, 9%, 12% and 15% of carbon by using pressure. After mixing the materials are pressured in order to get solid material. [2] implies that adhesive addition will significantly impact on briquette’s characteristics, such as: density, ash and water content. The more adhesive, it will get better density, pressure and more ash and water except for heating value will be inversely proportional.

2 Methodology

Fuel is material which can be changed to be energy. Normally fuel contains calorie of heat that can be manipulated. Mostly the fuel used by human being is the fuel which the combustion reacted with oxygen.

The combustion is a chemical reaction of fuel and oxidation that can produce heat and light. The combustion can be burn out if there is [4]:

a. Fuel
b. Oxidation / air
c. Heat

Calorie value of fuel analysis in order to get data of calorie of heat produced by combustion process [3]. The good quality briquette has a smooth texture, tough, environmentally friendly, inflammable, long lasting combustion, no smoke black and high heating value. The longer flame constantly, it will be better [4].

Heating value consists of highest heating value and lowest heating value. Highest heating value is resulted by perfect combustion of compact and liquid fuel. Lowest heating value is heating value minus the heat required for water [5].

2.1. Briquette Characteristic Calculation

Briquette characteristic calculation is to calculate combustion value.

Heating value: 

$$H = \frac{W \times T - E_1 - E_2}{m}$$  \hspace{1cm} (1)$$

Note:

H = heating value of sample combustion (cal/gr)  
W = energy equivalent (cal/c)  
M = sample mass (gr)  
T = temperature rise (c) (T2-T1)  
E1 = heat correction of sample (cal)  
E2 = heat correction of hot wire (cal)

2.2. Density

Mass density is calculated by the following equation:

$$\rho = \frac{m}{V}$$ \hspace{1cm} (2)$$
Note:
\[ \rho = \text{density (g/cm}^3) \]
\[ m = \text{mass (g)} \]
\[ v = \text{volume cetakan yang digunakan (cm}^3) \]

2.3. Briquette Combustion Value
Briquette combustion value is ratio between material mass and testing duration. The combustion value is calculated by using quotation:

\[ M = \frac{m}{s} \]  

(3)

Note:
\[ M = \text{combustion value (gr/minute)} \]
\[ m = \text{test material mass (gr)} \]
\[ s = \text{waktu (minute)} \]

2.4. Ash Content Calculation
Ash content is calculated by:

\[ \frac{F}{C} \times 100 \% \]  

(4)

Note:
\[ F = \text{residual weight} \]
\[ C = \text{sample weight} \]

This research uses experiment method. The equipments used in this study are: strainer 60 mesh, carbonized drum, chopper equipment for durian skin, briquette press, digital scale, thermocouple, oven, stop watch, pot of water, measuring cup, spatula, pestle, briquette stove, bomb calorie meter and lighter. The materials used are: durian skin and tapioca.

2.5. Briquette
The dried durian skin is chopped and mashed up, burnt in the drum in 3 – 4 hours. Carbon particle produced is mashed up with 60 mesh and mixed up with tapioca adhesive respectively 6% (2.04gr), 9% (3.06gr), 12% (4.08gr), 15% (5.1gr) of 34 gr carbon particle of durian skin and mixed up with water, then the mixture is heated to become thick tapioca and starch glue. Mixing process between starch and particle carbon of durian skin is done referring to the above procedure. The mixed stuff is molded then dried in oven with temperature 150 °C during 20 minutes in order to reduce water content of the briquette. The briquette characteristic is tested in oven with 250 °C.

3 Result and Discussion

3.1 Heating Value Testing
Heating value is tested by using calorimeter bomb to measure heat energy value of carbon powder with tapioca adhesive.
Figure 1 above shows that the increasing of heating value is inversely proportional with the increasing of tapioca adhesive value of each briquette. The highest heating value is 5915 cal/gr (34 gr carbon powder, 6 % gluten) and the lowest heating value is 5611 cal/gr (34 gr carbon powder, 14% gluten).

Based on heating value testing in this study that the addition of tapioca adhesive of the briquette should be controlled because tapioca comes from vegetable which is sensitive on humidity, hence overused may increase water content and ash content that may make bed impact on heating value of briquette.

### 3.2 Combustion Value Testing

Heating value of durian skin briquette is tested to find out the appropriateness to be a fuel. The testing is by observing the phenomenon when the briquette put inside oven starting from volatile and burning the briquette to become ash.

### Table 1. Relationship between variation of tapioca adhesive value on durian skin briquette and burning at constant temperature of 250 °C

<table>
<thead>
<tr>
<th>Adhesive value (%)</th>
<th>Burning duration (minute)</th>
<th>Complete burning duration (minute)</th>
<th>The highest temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>4.15</td>
<td>187.25</td>
<td>297</td>
</tr>
<tr>
<td>9</td>
<td>4.23</td>
<td>190.11</td>
<td>297</td>
</tr>
<tr>
<td>12</td>
<td>5.28</td>
<td>191.56</td>
<td>288</td>
</tr>
<tr>
<td>15</td>
<td>6.29</td>
<td>193.13</td>
<td>288</td>
</tr>
</tbody>
</table>
Table 2. Fuel distribution, length of burning and burning value.

<table>
<thead>
<tr>
<th>Carbon fuel particle + adhesive</th>
<th>Briquette drying (gr)</th>
<th>Burning duration (minute)</th>
<th>Burning value gr/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>34g BB + 2.04g P (6%)</td>
<td>49</td>
<td>187.25</td>
<td>0.2616</td>
</tr>
<tr>
<td>34g BB + 3.06g P (9%)</td>
<td>51</td>
<td>190.11</td>
<td>0.2682</td>
</tr>
<tr>
<td>34g BB + 4.08 g P (12%)</td>
<td>52</td>
<td>191.56</td>
<td>0.2714</td>
</tr>
<tr>
<td>34g BB + 5.1g P (15%)</td>
<td>53</td>
<td>191.13</td>
<td>0.2744</td>
</tr>
</tbody>
</table>

The experiment indicates that the lowest variation of tapioca adhesive (6%) produces 0.2616 gr/minute burning value, while the highest (15%) produces 0.2744 gr/minute. The adhesive material containing water will influence combustion.

4 Conclusion

Based on research, it can be concluded:

a. The increasing heating value is inversely proportional with percentage variation of tapioca adhesive of briquette.
b. The highest heating value is 5915 cal/gr (34 gr carbon powder, 6 % gluten) and the lowest heating value is 5611 cal/gr (34 gr carbon powder, 14% gluten).

c. The more adhesive, the longer briquette burns.

d. The lowest variation of tapioca adhesive (6 %) produces 0.2616 gr/minute burning value, while the highest (15 %) produces 0.2744 gr/minute.

e. The adhesive material containing water will influence combustion.

References


The Effect of Cooling Slope on Mechanical Properties of Aluminum-8.5wt.% Si Alloy Produced by Gravity Casting

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Abstract. Cooling slopes (CS) are the novel technique in the casting process, it suitable applied in the various alloys to modify the microstructure and mechanical properties. In the present work, the cooling slope has been designed and applied in the aluminum-silicon alloys. The effect of CS plate angle on microstructure and mechanical properties of aluminum alloy were investigated. The results suggested that the CS influenced the morphologies of materials which is correspond with the mechanical properties change.

Keywords: Aluminum-Si alloy, Sloping plate, Microstructure, Hardness

1 Introduction

The casting processes are widely used in the engineering field to produces aluminum alloys and metal matrix composites due to their low cost in production and easy to operate. The main problem of components that produced by casting processes has poor mechanical properties; such as tensile strength and toughness. Which is, these properties are very important as one of consideration in the material selection process. Many investigated have been done to improve the mechanical properties of cast materials, the addition of reinforced SiC particles in aluminum matrix composites [1], poa particles [2], and modification of microstructure by using grain refinement agents such Al-Ti and Al-Ti-B master alloys [3] are influence the mechanical properties of aluminum alloys. Besides the techniques above, recently, many researchers have developed the cooling slope system to improve the mechanical properties of casting materials. T.Haga et al [4] observed that casting factors such as nozzle size, height nozzle, tilt, and slope length influenced the semisolid slurry of the A356 aluminum alloy. The spherical microstructure of semi-solid slurry primary Al phase was observed in this alloy produced by cooling slope [5]. Besides the shapes grain, the size is important to determine the mechanical properties. Further, this technique can be used to reduce the grain size aluminum alloy [6] through slurry formation before flows into the permanent mold.

The cooling slope method was applied in various alloy system such A356 [4,5], AlSi7Mg [7] and AA 7075 wrought aluminum alloy [8]. From previous research shown that this technique was successful to modify a microstructure and mechanical properties of Al alloys, however, aluminum-8.5Si alloy produced by this technique is only a few. Based on this fact, in the present work discuss the effect of the cooling slope angle on microstructures and mechanical properties.
2 Methodology

In the present research, the Aluminum A356 ingots are used as a matrix with the main element alloy consist of Si, Fe, and Ti respectively see table 1.

<table>
<thead>
<tr>
<th>Elements</th>
<th>Si</th>
<th>Fe</th>
<th>Cu</th>
<th>Mn</th>
<th>Mg</th>
<th>Cr</th>
<th>Ni</th>
<th>Zn</th>
<th>Ti</th>
<th>Al</th>
</tr>
</thead>
<tbody>
<tr>
<td>wt.%</td>
<td>8.5</td>
<td>0.18</td>
<td>0.003</td>
<td>0.004</td>
<td>0.074</td>
<td>0.0007</td>
<td>0.002</td>
<td>0.004</td>
<td>0.159</td>
<td>bal.</td>
</tr>
</tbody>
</table>

The aluminum-silicon ingot has been melted by using conventional furnace, aluminum alloy was remelted in a graphite crucible with pouring temperature at 680 C. Cooling slope plate made from mild steel with 300 mm length as shown in fig. 1, the cooling slope angles were varied at 15°, 30°, 45°, 60° and 75° with respect to the horizontal plane. This plate equipped with a cooling system, water cooling media used to control temperature on the bottom surface of an inclined plate. The molten aluminum flowing on the plate surface cause sticking phenomenon. Boron nitride coating method used to prevent this phenomenon. The cylindrical permanent mold used in the present work made from mild steel with 80 mm inside diameter and 100 mm height. Further, aluminum melt flow filling the permanent mold followed by cool down to room temperature. The microstructures from bottom region samples were examined by using an optical microscope, metallographic investigation obtained without etched process on the specimens. Brinnel hardness test has been done with 500 kg load for 15 seconds in bottom area. Further, the Charpy method with 251.3 N of the load used to measure the impact strength and tensile test by using a universal testing machine to investigate the strength of materials at room temperature. The aluminum castings from the bottom and top area were selected for both of testing.

Fig. 1. Schematic cooling slope facility
3 Result and Discussion

3.1 Microstructures

Figure 2 shows the microstructure of aluminum-silicon alloy in the various tilt angle (a) 15, (b) 30, (c) 45, (d) 60 and (e) 75°.

Figure 2 shows the microstructures re-casting aluminum-silicon alloy which produced by cooling slope method with varying tilt angle. The microstructure visible consist of two main regions i.e. dark color identified as Si-rich dispersed between $\alpha$-Al dendrites with bright color. Figure 2a shows the microstructure aluminum-silicon alloy with 15° inclined, the small $\alpha$-Al grain with dimension less 50 μm in diameter was obtained. Figure 2b-e shows the dimension of $\alpha$-Al dendrites enlarged correspond with the increased inclined plate of cooling slope. Aluminum melt poured onto a high inclined plate is easier flowing down to fill the permanent mold. The sluggish solidification rate in the permanent mold compared with on the cooling slope surface, which is the microstructures and grain of aluminum influenced by solidification rate [9]. Solidification mechanism is important parameters in the grain growth process. R. Ritwik, et al., (2013) [7] observed that the microstructures influenced by the nucleation and growth mechanism.

Figure 2e shows the microstructure aluminum-silicon alloy particles consist of $\alpha$-Al dendrites with more than 200 μm length, in other side, most of Al-silicone eutectic elements dispersed between aluminum matrix. Silicone particles (dark area) has higher melting point than aluminum, it is one of the reasons in room temperature these particles are hard to form solid solutions with aluminum.

Figure 3 shows the microstructure of aluminum-silicon alloy in the various tilt angle (a) 15 and (e) 75°.
**Figure 3a** shows the microstructure recasting of aluminum-silicon alloy produced by 15° inclined plate, visible the eutectic silicon distributed with small size and more homogeneous. **Figure 3b** shows the distribution of silicone particles (dark area) at tilt angle 75°, the particles dispersed with clusters and longitudinal shape. The distribution and dimension of the silicon particles in the aluminum matrix are important after the properties of alloy.

### 3.2 The mechanical properties

**Figure 4** shows the hardness of aluminum-silicon alloy in a various inclined plate of the cooling slope. The maximum hardness 60.7 BHN was obtained at the low angle plate 15°. The increase of angle causes the hardness slightly decrease until 49 BHN at 75°.

![Fig. 4. Hardness of aluminium-silicon alloy in various tilt angle of the cooling slope.](image)

The hardness of aluminum alloys slightly decreased along with the increase of tilt angle due to more flow rate of aluminum filling the permanent mold cavity. It is believed that the more heat transfer rate on the plate surface because of direct contact with the air than the inside of the permanent mold. The slow heat transfer between the aluminum melt and wall mold cause the grain growth process occurred. In the present work, the lower hardness obtained due to the bigger □-Al grain formed with high tilt angle, see **Figure 2e**.

**Figure 5** shows the effect of slope angle of cooling slope on the impact strength of aluminum-silicon alloy in various tilt angle from 15 to 75°.

![Fig. 5. The Impact resistance of aluminium-silicon alloy in various tilt angle of cooling slope.](image)

The impact strength at 15° angle about 8 Joules, this value increased along with the increase of tilt angle until 45° about 12 Joules. Furthermore, the increase of tilt angle tends to reduce the impact energy until 75°. The impact strength between the bottom and top region of the aluminum castings are different, it can be identified that standard deviation several samples higher than others. It is believed that the impact strength of casting materials influenced by many factors such as pouring temperature [10], porosity, defect, and microstructure morphology. **Figure 5** shows that the impact strength is low and close to each other, this corresponds with the fracture surface (see **Figure 6**) of samples which is the surface visible with bright color, flat without stringy.
Fig. 6. Fracture surface of impact test for various tilt angle of cooling slope (a) 15, (b) 30, (c) 45, (d) 60 and (e) 75°.

Figure 7 shows the ultimate tensile strength of aluminum-Si alloy re-casting by cooling slope method with different tilt angle. The maximum ultimate tensile strength 135 MPa obtained at 45° inclined. The tensile strength of Al-Si alloy as shown as in Figure 7 tend to low compared with the standard specimen of aluminum A356 alloys. The tensile strength aluminum alloys decrease due to casting defects such cold flakes [11], porosity [12]. The present work obtained porosity inside of cast material cause deterioration tensile strength. Furthermore, the fracturing usually occurred in the area with a high concentration of porosity [12].

Fig. 7. The ultimate tensile strength of alloy in various tilt angle of cooling slope.
Figure 8 shows the surface fracture morphology of tensile test samples, the casting defects found in almost all specimen. The internal defect such porosity with different size found in many areas of samples see Figure. 8 (arrow no.1). The defects such as gas porosity and blowhole are a usual defect found in the materials produced by casting process [13]. The existence of porosity inside an aluminum castings influence to mechanical properties and yield strength [12]. Figure. 8 shows the surface visible flat with a little dark area and diameter of specimens are looks like the same size near fracture area, based on this characteristic can be drawn an assumption that samples have low elongation.

4 Conclusion

Based on the data of microstructures and mechanical properties can be drawn several points in the present work:

a. Cooling slope method was successful to produce Al-Si alloy cast with the different tilt angle.

b. The tilt angle of cooling slope influences the microstructure and mechanical properties of aluminum-silicon alloy.

c. Re-casting aluminum-silicon alloy by using gravity casting obtained different mechanical properties with a different cast area.

d. The mechanical properties such as impact and tensile strength are strongly influenced by casting defect, low mechanical properties obtained due to more porosity formed in microstructures.

References


The Influence of Managerial Supervision of Principal to Organizational Climate, and Work Satisfaction on Performance of Elementary School Principal in Medan

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Abstract. This research aims to discover the effect of school principal managerial supervision, organizational climate, and job satisfaction towards the performance of school principals at State Elementary Schools in Medan simultaneously and partially. This study uses quantitative methods, the model used is path analysis techniques and inferential analysis. The research population included all school principals from State Elementary Schools in Medan comprising 382 individuals from 224 schools as the sample of this study obtained determined by using Proportional Random sampling. The data were collected with questionnaire with closed-ended questions, analysed with SPSS program version 24. The research findings showed that all five hypotheses formulated were accepted. The findings showed that: (1) there was a direct effect of managerial supervision towards performance with path coefficient 0,210. (2) there was a direct effect of organizational climate towards performance with path coefficient 0,211. (3) there was a direct effect of job satisfaction towards performance with path coefficient 0,502. (4) there a direct effect of managerial supervision towards job satisfaction with path coefficient 0,509. (5) there was a direct effect of organizational climate towards job satisfaction with path coefficient 0,393. Meanwhile there was an indirect effect of managerial supervision towards performance through job satisfaction with 0,2555, and there was an indirect effect of organizational climate towards performance through job satisfaction with 0,1972. The most dominant variable towards performance was job satisfaction, while the most dominant variable towards job satisfaction was managerial supervision. Based on the research finding, it can be stated that improving the performance of school principals can be achieved through the improvement of managerial supervision, the establishment of good organizational climate, and the improvement of job satisfaction of Elementary school principals. Meanwhile, improving the Elementary school principals’ job satisfaction can be achieved through the improvement of managerial supervision, and the establishment of organizational climate.

Keywords: Managerial supervision, organizational climate, job satisfaction, performance

1 Introduction

Quality human beings can be formed through education, and various efforts have been made to improve the quality of human resources, especially through the world of education. According to the [1] National Education System Law (UU-SPN) Number 20 of 2003 article 1 states that: "education is a conscious and planned effort to realize a learning atmosphere and
learning process so that students actively develop their potential to have religious spiritual power, control self, personality, intelligence, noble character, and the skills needed by him, society, nation and state. The community depends on the quality of education services in schools. The service includes school quality which is expected to have a major impact on life in the future. All of this started from the principal as the school manager. Elementary School as basic education became an important foundation in the formation of children's character.

To achieve educational goals at school. The school principal is guided to be able to help teachers get job satisfaction at work. As an administrator, the principal is tasked with utilizing available resources including: teaching management, student management, personnel management, facility management, financial management, management of school and community relations. one of the characteristics of school principals who have good performance is being able to lead the school effectively. The performance of the principal is the ability to carry out the work or tasks possessed in completing a work at the school he leads.

Based on observations and interviews conducted by the author in July 2017 of 43 principals in Medan Tembung, 28% of the 43 people (12 people) experienced principals having problems, especially regarding the performance of elementary school principals, summarized as follows: (1) ability formulating a school development plan is still low. This is seen from the small number of school development program plans contained in the school strategic plan, (2) the low implementation of supervision by the principal to the teachers. It is known from the responses of the teachers that the supervision of the principal is likely to be unscheduled and carried out according to previous plans. In addition, there is no special reprimand for the teacher if the learning device is incomplete, merely an appeal; (3) the organizational climate is closed. It is known from the teacher's response that there is little discussion space between the principal and the teacher, the principal is not emotionally close to the teacher, teacher's suggestions and criticisms for school development are often not realized. The principal's policy without the involvement of the teacher as a whole so that it has an impact on ineffective and ineffective performance. Also, the school organizational climate that is not harmonious and conducive between principals and teachers, and among fellow teachers greatly influences one's performance. (4) job satisfaction of principals and teachers is quite low. This can be seen from some of the responses of teachers and principals regarding school support facilities that are less updated and complete to support student learning even better. (Supporting facilities such as a room that is too hot there is no air conditioner, dark room because there is no lighting / lights, inadequate lavatories and other facilities) and (5) lack of optimal managerial ability of principals in carrying out their duties in school. Some principals have not been able to achieve the expected work standards. This is seen from the slow pace of the principal in carrying out / completing the assignments given to him, and the attitude that is less assertive in giving a warning / sanction to the teacher who leaves the class before the lesson ends or delays his duties.

Principals are required to make changes in an effort to improve the quality of school quality, not only in teaching methods and curriculum, but also in management and organization. Principals must master managerial competencies, in addition to other competencies such as personality competencies, and entrepreneurship. A successful school principal in carrying out his duties is the principal who shows his professional skills as a leader, has broad insight and understands the school's vision and mission so that the school's objectives reached. A conducive and pleasant organizational climate will certainly be a big capital and will have a major impact on achieving organizational goals.
The linkage of organizational climate to job satisfaction is explained by [2] Wirawan that organizational climate can influence employee behavior and ultimately affect employee morale, job satisfaction and organizational performance. If employee morale decreases, it will have a negative impact on the development of an organization. Organizational climate directly becomes a factor that will affect job satisfaction in organizations. Based on the above background and consideration of how important the role of the principal's performance is allegedly influenced by: managerial supervision of school supervisors, organizational climate, and job satisfaction, the authors are interested in making research entitled "The Effect of Principal Managerial Supervision, Organizational Climate, Job Satisfaction on the Performance of Elementary Schools Principal in Medan".

In general, the study aims to find an overview of the influence of the principal's managerial supervision, organizational climate, and job satisfaction on the performance of the principal of the elementary school in Medan City. Specifically, this research aims to find out about: (1) Effect of managerial supervision of principals on the performance of public elementary school principals in Medan City, (2) Effect of organizational climate on the performance of Elementary School principals SD in Medan, (3) Effect of job satisfaction on the performance of Elementary School principals in Medan. (4) Effect of managerial supervision of principals on job satisfaction of Elementary School principals in Medan. (5) Effect of organizational climate on job satisfaction of Elementary School principals in Medan.

<table>
<thead>
<tr>
<th>Table 1. Iktisar Perpektif Kinerja (Sonnentag, 2012. p. 9)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core question</strong></td>
</tr>
<tr>
<td><strong>Core assumptions and findings</strong></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td><strong>Practical implications for performance improvement</strong></td>
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<td></td>
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</table>

[3] Sonnentag also said that individual performance can be viewed from three perspectives, namely the perspective of individual differences, the situational perspective, and the regulatory perspective of performance. The perspective of individual differences includes differences in competencies or abilities, personality, motivation, interests, traits, attitudes, etc. The perspective of individual differences corresponds to individual psychological theories. Whereas the situational perspective includes the internal and external environmental conditions of the organization that support actions in achieving performance. The situational perspective is in line with the expectation theory (expectancy), the theory of failure and punishment, fairness and equity, the theory of work facilities and technology. Regulatory
perspectives include worker competency engineering, which is supported by industrial psychology theory, work psychology.

[4] Colquitt, LePine, and Wesson propose an organizational behavior integration model that explains that organizational mechanisms, group mechanisms, and individual characteristics directly influence individual mechanisms, and then individual mechanisms directly influence outcomes. Individual results. In language, [5] the word supervision comes from English supervision which means supervision (Tim, 2001a: 84). [6] This word comes from two super words and vision which means to look carefully at the work as a whole (Thaib and Subagio, 2005: 2).

[7] Newstrom and Davis state that the organization's climate is that which concerns all existing environments or faced by humans in an organization where they carry out their work. [8] Gibson states that, "Organizational climate is the study of individual perceptions regarding various aspects of the organizational environment. "The elements can be perceived and experienced by members of the organization and reported through the right questionnaire.

[4] Colquitt, LePine, and Wesson suggest job satisfaction is defined as a pleasant feeling resulting from assessment of work or work experience. [9] Wegner and Hollenbeck state that job satisfaction is a pleasant feeling that results from the perception that work someone fulfills or allows for the fulfillment of important work values. Job satisfaction includes three main components: value, importance of values, and perception. Value is not the same as the need in the sense that the needs are the most basic for life, such as the need for oxygen and water. The second component is the importance of values. People not only differ in the values they believe in, but also in their weight for those values, and critical differences affect their level of job satisfaction.

The hypothesis is a temporary answer to the formulation of the research problem, where the formulation of the research problem has been expressed in the form of a question sentence, [10] Sugiono. Based on the research paradigm above, the following hypothesis is formulated:

a. There is a direct influence of the principal's managerial supervision on the job satisfaction of elementary school principal in Medan.
b. There is a direct influence of the organizational climate on the job satisfaction of elementary school principal in Medan.
c. There is a direct influence of the principal's managerial supervision on the performance of elementary school principal in Medan.
d. There is a direct influence of the organizational climate on the performance of elementary school principal in Medan.
e. There is a direct influence of job satisfaction on the performance of elementary school principal in Medan.

2 Methodology

The model used is a path analysis model (path analysis) or often referred to as a causal relationship pattern. The variables used in the study include four variables, which consist of independent variables namely managerial supervision of the principal (X1), and organizational climate (X2); intervening variables namely job satisfaction (X3); and the dependent variable is the performance of the principal (X4). This research was conducted through quantitative field studies by distributing instruments in the form of questionnaires given to respondents.
### Table 2. Summary of the Results of the Conference of Relative Direct Effect of Managerial Supervision (X1) on Job Satisfaction (X3) and the Relative Direct Effect of Organizational Climate (X2) on Job Satisfaction (X3).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Direct Influence to (X3)</th>
<th>Total Effect</th>
<th>Correlation Coefficient (r)</th>
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<tbody>
<tr>
<td>X1</td>
<td>0.509</td>
<td>0.509</td>
<td>0.793</td>
</tr>
<tr>
<td>X2</td>
<td>0.393</td>
<td>0.393</td>
<td>0.760</td>
</tr>
</tbody>
</table>

### Table 3 Summary of the Results of the Conference The Direct Influence of Proposed Managerial Supervision (X1) on Job Satisfaction (X3) and the proposed Direct of Organizational Climate (X2) on Job Satisfaction (X3).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Direct Influence to (X3)</th>
<th>Total Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>0.2591</td>
<td>0.2591</td>
</tr>
<tr>
<td>X2</td>
<td>0.1544</td>
<td>0.1544</td>
</tr>
</tbody>
</table>

### Table 4. Summary of Results of the Conference Relative Influence of Management Supervision (X1), Organizational Climate (X2) and Job Satisfaction (X3) on Performance (X4).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Influences</th>
<th>Total Effect</th>
<th>Unlaine</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>0.210</td>
<td>0.255</td>
<td>0.465</td>
<td>0.488</td>
</tr>
<tr>
<td>X2</td>
<td>0.211</td>
<td>0.197</td>
<td>0.408</td>
<td>0.0805</td>
</tr>
<tr>
<td>X3</td>
<td>0.502</td>
<td>0.502</td>
<td>0.0805</td>
<td>0.163</td>
</tr>
</tbody>
</table>

### Table 5. Summary of Results of Proportional Proportional Effects of Managerial Supervision (X1), Organizational Climate (X2) and Job Satisfaction (X3) on Performance (X4).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Influences</th>
<th>Total Effect</th>
<th>Unlaine</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>0.441</td>
<td>0.083</td>
<td>0.524</td>
</tr>
<tr>
<td>X2</td>
<td>0.445</td>
<td>0.080</td>
<td>0.525</td>
</tr>
<tr>
<td>X3</td>
<td>0.252</td>
<td>0.252</td>
<td>0.1068</td>
</tr>
<tr>
<td>Total</td>
<td>0.301</td>
<td>0.1068</td>
<td>0.466</td>
</tr>
</tbody>
</table>

### 3 Result and Discussion

#### 3.1 Managerial Supervision (X1) Directly Affects Performance (X4) Elementary School Principal in Medan

The results of this study partially show that managerial supervision variables have a positive and significant direct effect on the performance of elementary school principal in Medan with the acquisition of $\rho_{41} = 0.210$ and $t$ count = 3.021 with a probability of 0.001; means Ho is rejected or Ha is accepted thus it can be concluded that managerial supervision has a direct positive and significant effect on the performance of Elementary School principal in Medan.
3.2 Organizational Climate (X2) Directly Affects Performance (X4) Elementary School Principal in Medan City

The results of this study partially show that the organizational climate variable has a significant positive direct effect on the performance of the Head of Public Elementary School in Medan City with the acquisition of $p_{42} = 0.211$ and $t_{count} = 3.761$ with a probability of 0.000; means Ho is rejected or Ha is accepted thus it can be concluded that the organizational climate has a direct positive and significant impact on the performance of Elementary School Principal in Medan.

3.3 The Effect of Managerial Supervision on Job Satisfaction of Elementary School Principal in Medan

The results of this study partially show that the Managerial Supervision variable has a significant positive direct effect on Job Satisfaction of the Head of Public Elementary School in the City of Medan North Sumatra with the acquisition of $p_{31} = 0.509$ and $t_{count} = 9.618$ with a probability of 0.000; means that Ho is rejected or Ha is accepted thus it can be concluded that managerial supervision has a direct positive and significant impact on job satisfaction of the head of Elementary School principal in Medan.

3.4 The Influence of Organizational Climate on Job Satisfaction of Elementary School Principal in Medan

The results of this study partially show that the organizational climate variable has a significant positive direct effect on job satisfaction of the head of public elementary school in Medan City with the acquisition of $p_{32} = 0.393$ and $t_{count} = 7.422$ with a probability of 0.000; means that Ho is rejected or Ha is accepted thus it can be concluded that the organizational climate has a direct positive and significant impact on the job satisfaction of elementary school principal in Medan.

4 Conclusion

Based on the results of data analysis and discussion of research results, the following conclusions are obtained:

a. Managerial supervision has a direct positive effect on the performance of elementary school principal in Medan. The higher the managerial supervision of elementary school principal, the better the performance of elementary school principal in Medan.

b. The organizational climate has a direct positive effect on the performance of elementary school principal in Medan. The better the climate of the Headmaster's organization, the better the performance of the Principal of elementary school principal in Medan.

c. Job satisfaction has a direct positive effect on the performance of elementary school principal in Medan. The higher the job satisfaction of elementary school principal, the better the performance of elementary school principal in Medan.

d. Managerial supervision has a direct positive effect on job satisfaction of Elementary School Principal in Medan. The higher the managerial supervision of elementary school principal, the better the performance of the Principal of elementary school principal in Medan.
The organizational climate has a direct positive effect on the job satisfaction of elementary school principal. The higher the climate of the Headmaster's organization, the higher the job satisfaction of elementary school principal in Medan.

Based on the conclusion of the study, the following suggestions were submitted:

a. For Education Office in Medan, in an effort to improve the performance of Elementary School Principals in Medan, efforts need to be made to improve managerial supervision, organizational climate, and job satisfaction of elementary School Principals through various activities such as: Creating a conducive school culture and climate, then planning and implementing supervision in order to realize effective learners so that the development of a quality culture leads to superior schools. As well as identifying the strengths and weaknesses of school principals in the field of managerial supervision, organizational climate, and job satisfaction of school principals, so as to provide input to improve the performance of elementary school principal in Medan.

b. For principals to always create a conducive school climate to create effective learning, effective managerial supervision of the principal will shape a healthy organizational climate; so that from the achievement of the managerial supervision of the principal and the formation of a good organizational climate this will form the job satisfaction of elementary school principal in the end will have a positive impact on the performance of the Principals.

c. For supervisors of elementary school principals in Medan City, as information in fostering the improvement of school principals' performance, they should first pay attention to guidance in the field of managerial supervision of school principals, organizational climate, and job satisfaction.

d. For the chairperson of the elementary school committee, as information in developing policies on development efforts and improving the performance of principals by first improving aspects of managerial supervision of principals’ supervisors, organizational climate, and job satisfaction.

e. For Researchers. The findings of the study can be used as researchers and other researchers to study more about the performance of the Principal, by expanding the variables studied, aside from managerial supervision variables, organizational climate, and job satisfaction which are thought to affect the performance of elementary school principal in Medan the Principal of Public Elementary Schools in Medan.

References

The Effect of Learning Strategies and Motivation on Reading Texts Comprehension

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Abstract. This study aimed to: (1) find out the comprehension ability of reading reading texts of students taught with inquiry learning strategies with students taught using expository, (2) determine reading comprehension ability of reading texts of students who have higher learning motivation with students who have low motivation, and (3) find out the interaction between learning strategies and motivations for students' reading comprehension ability. The research design was presented in factorial 2x2 design with variance analysis technique (Anava). Data collection techniques carried out were multiple choice reading comprehension tests, as well as learning motivation questionnaires. The results of the study showed: (1) students were taught with inquiry learning strategies obtained higher reading comprehension than students taught with expository strategies where \( F_{\text{observed}} = 3.830 > F_{\text{table}} = 3.26 \), (2) students who have high learning motivation gained high reading comprehension than students who have low learning motivation where \( F_{\text{observed}} = 11.397 > F_{\text{table}} = 3.26 \), (3) there was no interaction between learning strategies and motivation towards reading texts comprehension where \( F_{\text{observed}} = 0.456 < F_{\text{table}} = 3.26 \).

Keywords: Learning strategy, motivation, inquiry, expository, reading comprehension

1 Introduction

Vocational High School (SMK) Education was one of the formal education institutions in the category of secondary education that was quite strategic in realizing the government's mandate in the field of education. Therefore, all the subjects taught must be improved in quality. In learning English was very closely related to the real world in everyday life. Teachers can open many minds of students to learn the concepts in use on the aspects contained in English subjects to solve a problem or cases and encourage students to make the connection between English materials and its application related in daily life. To explore the potential of children to always be creative and developing, it was necessary to apply meaningful learning that would bring students to a memorable learning experience.

Learning strategies also influenced students learning outcomes, the reality obtained in the field was that the average learning outcomes of students of Vocational High School (SMK PAB 12 Saentis) was still low and has not been as expected, due to the low of reading ability owned by the students. While learning English students not only was it demanded just to understand and comprehending the contents of the reading, but it must also be able to analyze, evaluate and relate it to the experiences and initial knowledge that it already has. In this regard, information on learning English must be studied by people so that learning objectives can be addressed widely to facilitate students in understanding learning.
Based on several studies on inquiry learning, [1] showed that the results of learning conveying opinions in discussions after using the Inquiry model in grade X of Senior High School (SMA) 2 Selimbau of Kapuas Hulu District giving the significant contributions to students learning outcomes in Indonesian language learning and can improve students learning outcomes. [2] found that the influence of guided inquiry learning model can improve the learning outcomes of grade IX of Islamic Junior High School (MTs) of Madani Alauddin Pao-pao.

Based on those findings, it was necessary to ascertain what learning model was suitable in implementing economic learning so that students easily understood it. For this reason, one factor that needed to be considered was the learning process. It was necessary to study a more basic learning model because it required a deep understanding of English as well as existing problems so that it took a learning model and invited students to make it easier for students to understand a text reading. In connection with this the form and model of inquiry learning can be an alternative in learning English. In line with the findings of [3] inquiry learning strategy was a series that emphasized the process of learning to think critically and analytically to seek and find the answers themselves from a problem that is questionable. The process of thinking itself was usually done through question and answer between teacher and students. Other learning models that would be seen influence was expository, according to Killen [4], expository learning strategy was one of the learning strategies that emphasizes the process of delivering material verbally from a teacher to a group of students with the intention that students can master the subject matter optimal. the expository learning strategy was a form of a teacher-oriented learning approach (Teacher centered approach) said so, because in this strategy the teacher holds a very dominant role. Through this strategy the teacher delivered structured learning material in the hope that the subject matter delivered can be mastered by students well. The main focus of this strategy was the students’ academic achievement.

Therefore, it was necessary to do research on the effect of learning strategy and student motivation on learning outcomes in English. The application of the learning strategy will be designed with a very efficient link covering students, teachers, learning processes and learning environments, namely inquiry and expository learning models as a factor that can affect the increase in learning outcomes. The purpose of this study was (1) to find out the comprehension ability of reading the reading texts of students taught with inquiry learning strategies with students taught using expository, (2) to determine the reading comprehension ability of students who have higher learning motivation with students who have low motivation, and (3) to find out the interaction between learning strategies and motivations for students' reading comprehension ability.

2 Methodology

This research was at Vocational High School (SMK) PAB 12 Saentis. The method used in this study was a quasi experimental method with a 2x2 factorial design with a significant level of 0.05 before two-way ANAVA test was carried out, firstly it was determined the requirements of analysis, namely the normality requirements using the Liliefos Test, while the homogeneity test used the Bartlett test and the F test with the intention that the sample distribution in the study population was homogeneous. After testing the requirements of the analysis, a two-way Anava test was then carried out. If the two-way Anava was significant,
then a further test (post hoc test) was held. Because the number of samples for each cell was not the same, Scheffe Test will be used.

3 Result and Discussion

3.1 Results

The hypotheses testing used variance analysis and factorial path of 2x2 (ANAVA) techniques. Research data were grouped based on the interaction between the learning model and students learning interest. The comparison of groups of student learning outcomes data based on research findings, briefly in Table 1.

<table>
<thead>
<tr>
<th>Motivation to learn</th>
<th>Learning model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inquiry</td>
</tr>
<tr>
<td>High</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>ΣX</td>
</tr>
<tr>
<td></td>
<td>ΣX²</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Low</td>
<td>ΣX</td>
</tr>
<tr>
<td></td>
<td>ΣX²</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Total</td>
<td>ΣX</td>
</tr>
<tr>
<td></td>
<td>ΣX²</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
</tbody>
</table>

Table 2. The Summary of Factorial 2x2 Anava Calculations

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>JK</th>
<th>Db</th>
<th>RJK</th>
<th>Fb</th>
<th>Ftab</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>572.45</td>
<td>1</td>
<td>572.45</td>
<td>3.830</td>
<td>3.26</td>
</tr>
<tr>
<td>B</td>
<td>1703.54</td>
<td>1</td>
<td>1703.54</td>
<td>11.397</td>
<td>3.26</td>
</tr>
<tr>
<td>Inter AB</td>
<td>68,102</td>
<td>1</td>
<td>68,102</td>
<td>0.456</td>
<td>3.26</td>
</tr>
<tr>
<td>in</td>
<td>8980.86</td>
<td>36</td>
<td>149.47</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>11324.95</td>
<td>39</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

a. First Hypothesis

Based on the results of calculations, it can be seen that the value of F<sub>observed</sub> inter columns was greater than F<sub>table</sub> (F<sub>observed</sub> = 3.830 > F<sub>table</sub> = 3.26) at the significant level of 5%. Thus, there was a significant difference between students learning outcomes taught by inquiry learning strategies and learning outcomes of students who were taught with expository learning strategies that were validated. In this case learning by using inquiry learning strategies was higher than learning by using expository learning strategies, because the average value of student learning outcomes taught by inquiry learning strategies (18.7) was higher than the average value of student learning outcomes taught by expository learning strategies (13.5).
b. Second Hypothesis

Based on the results of calculations, the value of $F_{\text{observed}}$ inter columns was greater than $F_{\text{table}}$ ($F_{\text{observed}} = 11.397 > F_{\text{table}} = 3.26$) at a significant level of 5%. Thus, $H_0$ was rejected and $H_a$ stated that reading comprehension of students in English Subjects who have high learning motivation was higher than those who have low learning motivation at SMK PAB 12 Saentis was validated.

c. Third Hypothesis

Based on the results of calculations, it can be seen that the value of $F_{\text{observed}}$ inter columns and rows (interactions) was smaller than $F_{\text{table}}$ ($F_{\text{observed}} = 0.456 < F_{\text{table}} = 3.26$) at the significant level of 5%. Thus, there was no interaction between the use of learning strategies and learning motivation in influencing students' reading comprehension was not validated.

3.2 Discussions

The Economics learning outcomes of students who were treated with inquiry learning models were higher compared to students who obtained treatment with the expository learning model.

The results showed that the average result of learning English as a whole group of students who obtained inquiry learning model was higher than with a group of students who obtained expository model. This was because the students in the group of inquiry learning model emphasized on merger/combination of learning discussion method and motivation in learning. Inquiry did not mean replacing the learning model of discussion in the classroom, but strengthening the learning model, because the students not only discussed but rather sharpening students' motivation such as discussing a problem. With student's inquiry learning it has positioned them self as the active students' actors who understands their needs and strived to achieve an understanding of knowledge independently. The activities carried out by students during the learning process took place would make students eager to follow the learning process.

The results of learning English of students who have the high learning motivation higher than students who have the low learning motivation. The results showed that the average value of learning outcomes of English students who have the high motivation to learn higher than students who have low learning motivation. This indicated that students who have the high learning motivation able to understand English language lessons compared to students who have the low learning motivation.

So, there was an increase in having learning motivation. This increase was due to students being able to study well, where students can solve the questions raised, the learning model that can foster students' enthusiasm in learning.

4 Conclusion

Based on the results of the research and discussion previously stated, then in this study it can be concluded that:

a. There were differences in learning outcomes of reading comprehension between groups of students taught with inquiry learning strategies with students taught with expository learning strategies.
b. There were differences in learning outcomes of reading comprehension between groups of students who have high learning motivation and groups of students who have low learning motivation.

c. There was no interaction between the application of inquiry learning strategies and expository learning strategies with high and low motivation to learn towards the learning outcomes of reading comprehension in grade X of SMK PAB 12 of Saentis.

References


The Implementation of KKNI-Based Curriculum On the Course of Guidance Counseling Management at the State University of Medan

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Abstract. This study aims to determine the implementation of the IQF curriculum, the relationship between the implementation of the IQF curriculum with the improvement of students' knowledge, skills, and attitudes, as well as obstacles in implementing the IQF curriculum in the course of BK Management at Unimed FIP BK Department. The research approach used is qualitative research, researchers as research instruments. Other tools used by observations using field notes, checklists, interviews and documentation. The design of the study is a case study for the purpose of describing the implementation of IQF in BK management courses at Unimed FIP BK Department. This research was carried out in the learning class of the guidance counseling management courses at the Department of Counseling Guidance, Faculty of Education. The subject of the study was the learning of Counseling Guidance Management courses that implemented the IQF curriculum. The results showed that the implementation of IQF in BK management courses applied 6 tasks, the implementation could change learning behaviors such as: (1) students have more preparation for college, (2) class discussion in accordance with the topic of lectures and depth, (3) dissenting opinions healthy, (4) Motivation to ask increases, (5) written test has not been significant with learning behavior, the way to evaluate the process first is then expected to change learning outcomes, assessment of learning outcomes students need time to cultivate positive learning behavior through 6 assignments. According to the observations of researchers with the IQF curriculum there was a change in the learning process, but it was not significant to change learning outcomes.

Keywords: KKNI-based curriculum, implementation in BK management courses

1 Introduction

The higher education curriculum is a set of plans and arrangements regarding the content, study materials, as well as learning materials and how they are delivered, and assessments used as guidelines for the implementation of learning activities in higher education institutions. The curriculum should contain graduate competency standards structured in key competencies, support and others which supports the achievement of goals, the implementation of the mission, and the realization of the vision of higher education institutions. The curriculum must be designed based on its relevance to the purpose, scope and depth of the material, organizing that encourages the formation of hard skills and personality and behavioral skills (soft skills) that can be applied in various situations and conditions.
This review is in an effort to produce a basic curriculum framework covering knowledge and understanding, assessment, communicating, behaving and behaving, and independent learning / developing oneself etc. The depth level of the basic elements in each education level (Diploma, Bachelor, Master and Doctoral) is in accordance with the profile of Unimed graduates. Basic Framework Guidelines for Curriculum Development as alignment with the National Education Standards and the Indonesian National Qualifications Framework are references to determine student ability criteria (student outcomes) for each study program or expertise family. It is expected to be able to freely develop the study program curriculum in a predetermined scope.

The results of the Self Evaluation analysis revealed that the curriculum at the Unimed FIP BK Department had not yet linked and matched the needs of stakeholders. This is due to, among other things, curriculum development not yet based on holistic evaluation and lack of lecturers' ability to translate curriculum into learning activities. Based on the results of the Self Evaluation, it was found that there was a lack of academic achievement (a high GPA) and the performance of graduates in the field. Meanwhile, based on the results of the tracer study, it was shown that BK Department graduates who had worked were still lacking in terms of pedagogic competence, especially BK- materials.

In 2010 socialization of curriculum implementation was carried out by paying attention to the contents of the curriculum curriculum by inviting stakeholders in an effort to provide reinforcement and mastery of the field of study. Although the socialization of curriculum implementation has been carried out again in 2010, the curriculum in the BK Department has not yet designed the PBM process according to Q: P: L according to Ministerial Decree 232. PBM still uses the CTL system yet SCL. In addition, lecturers have not motivated students to study independently. The future challenge of BK Department graduates is globalization. In this globalization era graduates are required to master ICT and English. If graduates do not master these two fields, then other graduates will be eliminated.

The implementation of learning in the BK Department still uses the Competency-Based Curriculum. Based on government regulations and provisions concerning the Higher education curriculum, referring to the Indonesian National Qualifications framework (KKNI) in accordance with Presidential Regulation Number 8 of 2012. namely: Framework for Competency Qualifications that can compare, equalize and integrate education and work as well as work experience in the framework of providing employment recognition in accordance with the structure of work in various sectors. The IQF is a manifestation of the quality and identity of the Indonesian people in relation to the national education and training system owned by Indonesia.

Increasing the competitiveness of BK Department graduates must be done by applying curriculum that suits the needs of stakeholders. Therefore, curriculum development must be carried out in accordance with the needs of stakeholders. This activity is part of the academic service improvement program set out in the 2011-2015 Strategic Plan. BK majors in the future must be able to determine/arrange learning outcomes graduates who have the ability in the field of work, knowledge mastered and have managerial skills. For the formation of courses must pay attention to the profile of graduates, learning outcomes, study materials and courses as well as the size of credits.

To respond to the above regulations, the BK Department tries to revise the existing curriculum, among others on the formulation of Graduates' Competencies that refer to the IQF, namely the profile of graduates, achievement of graduate learning according to the level of qualification of the IQF and learning achievement and characteristics of university graduates. The Indonesian National Qualification Framework (KKNI) is an embodiment of the quality...
and identity of the Indonesian Nation in relation to the national education system, the national job training system and the national equivalence achievement assessment system, which Indonesia has to produce quality and productive national human resources.

The KKNI-Based Curriculum Implementation in the BK Management Course includes:
how the learning kit of the BK management course is prepared before the lecture, how to implement the learning in the BK Management subject in the Unimed FIP BK department to improve student knowledge, skills, and attitudes, what is constraints in implementing the IQF curriculum in the BK Management subject in the Unimed Department of FIP BK.

This research can provide benefits for Unimed FIP BK Lecturers about the importance of implementing the IQF on lecture devices to improve student competence. This implementation is part of an academic service improvement program carried out in accordance with stakeholder needs.

2 Methodology

This study uses a case study design. According to [1] Case studies are research strategies in which researchers investigate carefully a program, event, activity, process, or group of individuals. Cases are limited by time and activity, and researchers collect complete information using various data collection procedures based on the time specified. [2] in her book "The Sage Encyclopedia of Qualitative Research Methods" revealed that "A case study is a research approach in a phenomenon that is studied in depth. This type of case study is Microethnography, a type of case study carried out on very small organizational units, such as a part of a classroom or a very specific organizational activity for students who attend lectures with the IQF curriculum in BK management courses.

[3] Data collection techniques observation, interviews, and documentation analysis. The researcher as a research instructor, adjusts the way of collecting data with problems and the implementation environment of lectures, and can collect different data simultaneously. Researchers make coding about various learning components used in the class, among others; RPS, RPS implementation, lecture systematics, teaching materials, student activities, lecturer activities, media, student management, material management, time management, lecturer and student interaction, and evaluation.

Research approach used qualitatively[4][5], researchers as research instruments. Other research instruments observation using field notes, check lists, interviews and documentation. With the design of a case study for the purpose of describing the implementation of IQF in the BK management course in the department of Unimed FIP BK.

The subjects in this study were learning counseling guidance management courses that implemented the IQF curriculum.

Data analysis techniques after the data is collected researchers do editing, aggregate, organize, and classify data into manageable units. Aggregation is the process of abstracting specific things into general things in order to find a general pattern of data. Data can be organized chronologically, categorized or entered into typologies. Data analysis is carried out since researchers in the field, during data collection and after all data has been collected or after completion and field.

Refinement [6].Although all data has been collected, researchers refine or reinforce new data on categories that have been found. New data collection requires researchers to return to
the field and perhaps have to create new categories, new data cannot be grouped into existing categories.

Report writing [7]. Report writing is communicative, easy to read, and describes a phenomenon or social unity clearly, making it easier for readers to understand all important information. The report is expected to bring the reader into the case study situation with the IQF in the BK management subject.

In the case study method, there are five substantial components of research design, namely: (a) research questions, (b) propositions, if any, (c) analysis units, (d) logic that associates data with existing propositions, (e) criteria for interpreting findings. Whereas, the criteria for determining the quality of research design according to certain logic tests include: (a) construct validity, Establishing the correct operational size for the concepts to be examined. (b) internal validity (only for explanatory and causal methods). Establish a causal relationship, where certain conditions are shown to direct other conditions, as distinguished from false relationships. (c) external validity. Establish the domain in which the findings of a study can be visualized. (d) Reliability, showing the implementation of research such as data collection procedures can be interpreted with the same results.

3 Result and Discussion

The results of the study are presented in accordance with the focus of the problem of implementing the curriculum based on IQF in the BK Management Course including: How is the learning device of the BK management course prepared before the lecture. Learning tools are prepared by lecturers a week before lectures such as Semester Implementation Plan (RPS), lecture contracts, guidelines for implementing BK management courses (see attachment). The head of the faculty and faculty leaders urge all lecturers to arrange learning tools such as RPS, lecture contracts, and assignment and assessment guidelines to be used as a reference for lectures.

At the first meeting, the lecturer delivered the contents of RPS, contracts, assignment guidelines and assessments. The results of the first meeting found agreement on various matters concerning lecture on BK management for one semester, among others: the lecture strategy prioritized student activities, all student activities were recorded in academic records, regulations on student and lecturer attendance, completion of tasks, ways to download material lecture.

Lecture strategy by prioritizing student activities means that every day students prepare lecture materials according to the contents of the contract by reading, writing, handwriting on this folio paper called routine tasks. Next, two students are tasked with delivering the content of lecture topics according to the ability of students. The lecturer listens, while giving notes to each student's academic record as the following example.

<table>
<thead>
<tr>
<th>Date/Month</th>
<th>Activity</th>
<th>Lecturer Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>23/08/2017</td>
<td>Reading, explaining the meaning of management and organization Percentage, for students who present.</td>
<td>Repaired bibliography written with DP PW is good, communication is improved</td>
</tr>
</tbody>
</table>
Routine tasks completed by students after they are recorded on academic records, the assignments are returned each. Students document all the work done on files in their homes. Returning student assignments is done before class discussion to deepen the material, therefore the lecturer reads the student's assignment to see the ability to read and write by looking at the contents of the writing and bibliography. Task checks are carried out when students are in percentage. The time needed for students is 35 people maximum 20-30 minutes.

After finishing checking the assignments the student lecturer provides information on various things about the student's work such as literacy skills that must be improved how to write the results of reading from various sources. Making sentences in the form of paraphrases, information about academic honesty is trained by writing a bibliography used in writing. Furthermore, the lecturer added material to enrich students' insight through various case examples, BK management problems and efforts that could be made.

Class discussions were carried out well, student questions were directed. There were all active students who asked and there were students who answered. If the student has not managed to answer correctly the lecturer helps to direct the appropriate answer. Class discussions last for 40 - 45 minutes.

At the end of the lecture the lecturer asks students to write in their notebooks about the knowledge, skills and attitudes gained in the lectures that have lasted for approximately 10 minutes. At the end of the lecture for 5 minutes the lecturer asked all students to read the college contract to find out the next week's lecture preparation.

Therefore, every day students bring lecture contracts to prepare for their next routine assignments.

Learning Implementation in BK Management Course in Uniped FIP BK Department for Improving Student Knowledge, Skills, and Attitudes as follows:

The development of student learning methods, observation data on student learning behavior can be seen, among others, (a) before entering college, all students are busy with routine tasks. No more students dwelling, not active, late, or pacing. (b) All students complete routine tasks, even though students are not present to send their routine assignments. More detailed improvements in students' knowledge, skills and learning attitudes are arranged in the following table.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Before KKNI</th>
<th>After KKNI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Lack of background knowledge</td>
<td>Enough background knowledge</td>
</tr>
<tr>
<td>Formative and summative written test results of 5% get A, 60% get B, 33% get C, 2% get D.</td>
<td>Formative and summative written test results of 7% got an A, 63% got a B, 28% got a C, 2% got a D.</td>
<td></td>
</tr>
<tr>
<td>Discussions about deepening of the material running modestly, less useful questions.</td>
<td>Deepening discussion of useful material, questions appropriate and necessary.</td>
<td></td>
</tr>
<tr>
<td>The knowledge is on the active ones only.</td>
<td>The knowledge is moderate</td>
<td></td>
</tr>
<tr>
<td>Skills</td>
<td>Lack of knowledge in academic writing.</td>
<td>The writing skills of scientific papers are better at writing paraphrase sentences, quoting writing, compiling ideas in paragraphs.</td>
</tr>
<tr>
<td>Feedback on student assignments or</td>
<td>The way to write a bibliography</td>
<td></td>
</tr>
<tr>
<td>Aspect</td>
<td>Before KKNI</td>
<td>After KKNI</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>work is postponed.</td>
<td>is getting better.</td>
</tr>
<tr>
<td>Formative assessment</td>
<td>Skilled literacy (read, write) skills.</td>
<td>Process evaluation is carried out during learning</td>
</tr>
<tr>
<td>Attitude</td>
<td>Orientation awaits duty bills. If the lecturer forgets. The task is ignored.</td>
<td>Orientation asks and requires information about assignments</td>
</tr>
<tr>
<td></td>
<td>Cooperation between students in completing less assignments</td>
<td>Cooperation between students in completing high assignments</td>
</tr>
<tr>
<td></td>
<td>Concern for students with less assignments, submit assignments at the end of the lecture.</td>
<td>The level of concern of students with assignments is increasing.</td>
</tr>
</tbody>
</table>

a. **Obstacles in Implementing the IQF Curriculum in the BK Management Course at Unimed FIP BK Department**

1) The ability of students to answer questions given at the time of the exams is not optimal. Therefore, the formula for rating weight for formative and summative examinations 40% results in student scores not being satisfactory, even though students have done 6 other tasks such as routine assignments, criticizing books, criticizing journals, idea engineering, mini research and projects.

2) Assessment of 6 tasks completed by students cannot be done directly by lecturers. Using the assessment rubric is assisted by students to assess assignments. The number of high classes for lecturers in FIP, a lecturer reaching 30 credits is quite burdensome.

3) The task of students is not optimal because all the lecturers give 6 assignments, the tendency of students to do some tasks.

The increase in the results of written examinations has not shown significant effort with the tasks completed. The following question is “are all tasks the work of students themselves?” Or there are still ways that are not academically honest. Although the lecturer has arranged the task completion system by direct handwriting. Because all assignments are done off campus.

4 **Conclusion**

a. The implementation of IQF in BK management courses applies 6 tasks, namely (1) routine assignments, (2) book criticism, (3) journal criticism, (4) idea engineering, (5) mini research, (6) projects.

b. The implementation of IQF in BK management courses can change learning behaviors such as: (1) students have more preparation for college, (2) class discussion in accordance with the topic of lectures and depth, (3) differences of opinion provide healthy thinking, (4) Motivation asking increased, (5) written tests have not been significant with learning behaviour

c. The method for evaluating the process first is then expected to change learning outcomes.

d. Assessment of student learning outcomes requires time to cultivate positive learning behavior through 6 assignments.
e. According to the observations of researchers with the IQF curriculum there was a change in the learning process, but it was not significant to change learning outcomes.

References

Management of Engineering Physics Learning in the Electrical Engineering Education Study Program
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Abstract. Management of Physics Engineering learning is a development research to develop an appropriate learning model design for the study of Engineering Physics in the Electrical Engineering Education program of the Fakultas Teknik Universitas Negeri Medan. The research method used is Research and Development. The research sample is students who actively carry out learning Physics Engineering. Observation techniques and documentation studies are used to analyze learning needs and design learning models. Interviews, questionnaires and class observation sheets are used to see the success of the learning process. The test of student learning outcomes is used to see the effectiveness of the developed learning model prototype. The results of the implementation of the learning model indicate that student learning outcomes tend to be high. The application of Physics learning management that utilizes various sources can improve student competence. The application of physics learning management by utilizing e-learning can improve student competence beyond the graduation limit. The use of computer simulations can increase motivating students in learning. However, there are still 3% of students categorized as not competent because they are not used to learning by using e-learning facilities and computer simulation.

Keywords: Development of learning models, technical physics competencies, student learning outcomes

1 Introduction

Suggests that management refers to the process of coordinating and integrating work activities to be completed efficiently and effectively with and through other people [1]. Management of Physics Engineering learning is intended to develop interactive learning models in an effort to streamline and streamline the learning of Engineering Physics so as to improve student competence. Student activities in learning can encourage students to think creatively, convey information through group discussions. Lack of practicum equipment, can be overcome through the use of computer and internet simulations that can be accessed by students about the learning material. The interactive learning model developed will shape student learning habits through discussion of material in theory, practicum, and computer simulation. Student competence can be increased through the percentage of group learning activities, learning to express opinions and provide arguments against other groups, learn to listen and respect the opinions of other friends. Activities in interactive learning models can foster students' critical thinking through computer simulation activities in the learning process.
The implementation of interactive learning models, allowing students to use software physics applications that can be simulated on a computer monitor. The use of computer simulations can make it easier for students to understand learning material. The use of computer simulations can make it easier for students to solve the problems of Physics Engineering courses found in their daily lives. The development of interactive learning models will be able to improve the Engineering Physics competency of students in the Electrical Engineering Education Study Program, Medan State University. This is relevant to the results of [2] study which explains that interactive learning models can improve student competence in audio video expertise programs at SMK Negeri 4 Medan.

2 Methodology

[3] Explains that education management means as a systematic, systematic, and comprehensive collaboration process in order to realize the goals of national education. Based on its main function, the term management has the function of a) planning, b) organizing, c) leading and controlling [4]. Planning is a management function that includes the process of defining objectives, establishing strategies to achieve these goals and devising plans to integrate and coordinate a number of activities. Organizing is a management function that includes the process of determining what tasks to do, who should do, how to classify those tasks, who must report to whom, and where decisions must be made or at what level the decision must be made. Leading is a management function that includes motivating subordinates, influencing individuals or groups as they work, having the most effective communication channels and solving in various ways employee behavior problems. Controlling is a management function that includes monitoring actual performance, comparing actual to standard, and making corrections.

Management of learning Physics The technique meant in this study is the process of utilizing learning tools and supporting facilities for learning Physics effectively and efficiently. Effective means to help students and lecturers in the learning process to develop knowledge and skills. Efficient means to use energy, time, cost, and other facilities as economically as possible. The interactive learning model is supported by the learning theory proposed by Joice (2000) that in fact the core learning activities must be directly aimed at helping students achieve the most important basis of learning activities namely "how to learn" and "learning by doing". Relevant to these opinions as explained by Shank quoted by [12] to learn something apply the theory that you have gained in everyday life or do exercises to improve learning outcomes. For this reason, a learning model is needed that can improve student learning outcomes. With regard to learning as a system Endang (2000) and Vienna (2006) explain that the quality of graduates or learning outcomes depends on the components of the system itself, namely the input / input components, process components and output / output components.

The concept of an interactive learning model that includes activities: 1) didactic procedures, which determine the activities carried out by the lecturer during the learning process takes place, so that students achieve instructional goals in the most effective way possible, 2) learning media, 3) forms of student learning with pay attention to individual abilities [6][7][8]. In the context of classroom learning and curriculum development at the micro level, the position and position of the development of interactive learning models for
learning activities have been followed by students who are directed to the development of students so that students can study independently.

[9] provides an understanding for the development of learning models as the three activities as follows: 1) Design for an instructional developer to function as blueprint or blueprint for building experts; 2) Production which means the use of design to make instructional programs; 3) Validation which is the determination of the quality or validity of the final product resulting from the development of the learning model. Relevant to the above opinion [10] suggests that the learning model is a conceptual framework that describes systematic procedures in organizing learning experiences to achieve specific learning goals, and serves as a guide for learning designers and instructors in planning and implementing teaching and learning activities.

[11] Explain that whatever learning model is designed and developed, it must be realized that the main goal of learning is to help students develop the skills they need to work productively in order to increase the broader spectrum of various learning approaches. Next, Joyce & Weil explained that the whole learning activity must be directly aimed at helping students achieve the most important basis of learning activities, namely "how to learn" and "learning by doing". From the results of a study of various teaching and learning models that have been specifically developed and tested by education experts, [11] suggest that learning models or learning models have elements: 1) Syntagmatics; 2) Social System; 3) Reaction Principle; 4) Support System; 5) Instructional Impact and Companion Impact.

Planning and development of the model begins with a literature review and pre-survey, namely research and information gathering, including literature review, learning observation that aims to analyze and determine the basic competencies that must be owned by 52 students of the Department of Electrical Engineering Education. The matter stated was in accordance with product development research using Dick & Carey learning design development [12]. In this study the first was carried out with the research cycle of the development of "the R & D Cycle" [13]. The results of the field survey will be used as an information source for designing interactive learning models. The results of the development were revised based on expert team input. After the field trial, the learning model and learning strategy were revised based on the input of the expert team to get the management of Engineering Physics learning.

![Fig. 1. Model Development of Management of Engineering Physics learning. Adaptation of Gall, Borg and Gall (1996).](image)

The syntactic Engineering Physics learning model developed in an effort to improve student competence in the study of Engineering Physics in the Department of Electrical Engineering is as follows.
2.1 First Stage: Orientation
The orientation phase starts from explaining the learning objectives to be achieved, explaining the mechanism of learning in an interactive learning model, giving motivation to students to be able to learn independently and in groups, explaining to students how to use computer media as learning support, learning group sharing. Each learning group consists of students with varying competencies.

2.2 Study group stage
The learning group stage begins with the student setting sitting in groups according to the learning group. Distributing learning material to be presented by students according to the schedule and observation assessment sheet. Students in groups together understand the learning material that has been shared. Students are allowed to bring other learning resources related to learning material. Solving problems discussed in groups can be done by students through practicum or using computer simulations in accordance with learning materials and learning needs agreed upon in the Lecture Program Unit that has been established and agreed upon by lecturers and students.

2.3 Interactive stage
The interactive stage starts from one of the learning groups presenting the assigned tasks. The Pangamat group began to fill in activity observation sheets carried out by groups presenting their assignments. After finishing the percentage, an interactive activity is carried out between the presenter and the observer group. Interactive between the presenter group and the observer group was based on observations on the lecture material presented, both based on practicum and based on computer simulations. Lecturers provide direction if necessary. The percentage group makes conclusions about learning material that is discussed in theory, practice and computer simulation.

2.4 Transfer Phase
The transfer phase starts from the lecturer collecting observer group observation sheets. Lecturers analyze the results of the student's overall obsession. Lecturers provide reinforcement of the material that has been discussed together. The lecture provides examples of material applications. Lecturers provide reinforcement about the conclusions given by students. The lecturer recalls the material that will be discussed the following week.

3 Results and Discussion
Data on the implementation of interactive learning models in field test 1 can be seen in the following table.

<table>
<thead>
<tr>
<th>Student Group</th>
<th>Number of Student</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Competent</td>
<td>28</td>
<td>53.8 %</td>
</tr>
<tr>
<td>Enough Competent</td>
<td>11</td>
<td>21.2 %</td>
</tr>
<tr>
<td>Competent</td>
<td>10</td>
<td>19.2 %</td>
</tr>
<tr>
<td>Very Competent</td>
<td>3</td>
<td>5.8 %</td>
</tr>
</tbody>
</table>
From the results of observations of lecturers, and students found the impression that the implementation of interactive learning models is still not implied in accordance with expectations, and felt quite heavy for lecturers to motivate students to be interactive with the study groups who presented their group assignments. This is because students do not prepare themselves for the lecture material that has been determined in accordance with the agreed college contract. After being revised based on field trial 1, the learning model continues to field trial 2 and the results of the implementation can be seen in the following table.

Table 2. Field Test Results Data 2

<table>
<thead>
<tr>
<th>Student Group</th>
<th>Number of Student</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Competent</td>
<td>6</td>
<td>11 %</td>
</tr>
<tr>
<td>Enough Competent</td>
<td>11</td>
<td>21 %</td>
</tr>
<tr>
<td>Competent</td>
<td>18</td>
<td>35 %</td>
</tr>
<tr>
<td>Very Competent</td>
<td>17</td>
<td>33 %</td>
</tr>
</tbody>
</table>

From the results of the observations of lecturers, and students, the impression was that the implementation of the interactive learning model had not been implied in accordance with expectations. There has been an increase in student learning outcomes, because students have implemented mini research for field applications. In addition to facilitating student understanding, they want more examples of application of Engineering Physics from everyday life to further accelerate students' understanding of lecture material in accordance with the applicable curriculum. After being revised based on field test 2, the learning model continued to field trial 3, the results of which can be seen in the following table.

Table 3. Field Test Results Data 3

<table>
<thead>
<tr>
<th>Student Group</th>
<th>Number of Student</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Competent</td>
<td>2</td>
<td>3 %</td>
</tr>
<tr>
<td>Enough Competent</td>
<td>12</td>
<td>25 %</td>
</tr>
<tr>
<td>Competent</td>
<td>18</td>
<td>34 %</td>
</tr>
<tr>
<td>Very Competent</td>
<td>20</td>
<td>38 %</td>
</tr>
</tbody>
</table>

The achievement of the student's final score is then converted to the benchmark reference assessment that has been determined by Unimed with a range of 90-100 = A (very competent), 80-89 = B (competent), 70-79 = C (quite competent), ≤69 = E (incompetent), then the condition of students who take Physics I courses using interactive learning models is as follows.

Table 5. Percentage of Student Success

<table>
<thead>
<tr>
<th>No</th>
<th>Range of value</th>
<th>Number of Student</th>
<th>%</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90-100</td>
<td>20</td>
<td>38</td>
<td>Very Competent</td>
</tr>
<tr>
<td>2</td>
<td>80-89</td>
<td>18</td>
<td>34</td>
<td>Competent</td>
</tr>
<tr>
<td>3</td>
<td>70-79</td>
<td>12</td>
<td>25</td>
<td>Quite Competent</td>
</tr>
<tr>
<td>4</td>
<td>&lt;69</td>
<td>2</td>
<td>3</td>
<td>Not Competent</td>
</tr>
</tbody>
</table>

The results of the management of Engineering Physics learning in an effort to increase the competence of students in the Electrical Engineering Department showed a significant increase. The application of Physics learning management that utilizes various sources can improve student competence. The application of physics learning management by utilizing e-learning can improve student competence beyond the graduation limit. The use of computer simulations can increase motivating students in learning. However, there are still 3% of
students categorized as not competent because they are not used to learning by using e-learning facilities and computer simulation.

Management of learning Physics The techniques applied to improve student competence by forming study groups consisting of 5 students who chose their own friends to work together in the beajar group led them to be more interactive in their discussions. The results of field test data show that student achievement shows an increase from field trial 1, followed by field trial 2 and field trials 3. The results of student questionnaires show that students feel that time runs so fast and students like interactive learning models. In addition, the impact of the accompanying interactive learning model is that students become more confident, can communicate verbally as students present their group's work in front of the class and interact interactively with the learning groups that have been formed. Thus, it can be said that the development of interactive learning models can improve students' competence in learning Physics Engineering.

Based on the results obtained as stated above, the implementation of this teaching grant has basically reached the goal of implementing teaching grants. Engineering Physics lecturers have also been able to design and implement interactive learning models to improve student competencies in Engineering Physics courses. Engineering Physics Learning by using interactive learning models makes learning processes meaningful for students, because interactive learning processes have an accompanying impact such as students can have the nature of initiative, critical thinking, willingness to learn, polite in oral communication, ability to analyze, solve problems, good work in teams, listening skills, time management, can summarize and have an independent nature. In addition, a test is also produced for the results of learning Physics Techniques that can be used to test the results of Physics Engineering learning for parallel classes.

4 Conclusion

Engineering is the process of utilizing learning tools and supporting facilities for learning Physics Engineering effectively and efficiently in order to support learning activities in the classroom through the development of interactive learning models. The learning tools in question are college contracts, lecture event units, guidelines for 6 student assignments which include routine assignments, critical book reports, critical journals, mini research, engineering ideas and projects. Supporting facilities in question are practical facilities and infrastructures in workshops, teaching materials, internet, computer simulations, lecturer e-mails and e-mails for students and other facilities. Management of Engineering Physics Learning in the Electrical Engineering Education Study Program Faculty of Engineering Medan State University can improve student competence through the implementation of interactive learning models. The syntax of interactive learning models is orientation, group learning, interactive and transfer. Instructional impacts of interactive learning models are learning outcomes that are achieved directly by directing students to the expected goals of student learning outcomes. Companion impact is other learning outcomes that result from a teaching and learning process or learning process, as a result of the creation of a learning atmosphere that is experienced directly by students without direct guidance from lecturers, such as initiative, critical thinking, willingness to learn, oral communication, ability to analyze, solve problems, good cooperation in teams, listening, polite in speaking, time management, can summarize the material and be independent
References


The Perception Reflection Result of the Internship Program 1 Implementation and the Relationship with the Students Commitments in Equipping Themselves to Be A Teacher

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Abstract. This study examines the problem (1) how is the perception about the reflection of the Internship program 1 in Non-Formal Education Study Program, (2) how is the students commitment equip themselves to be a teacher in Non-Formal Education FIP Unimed, (3) whether there is a correlation between the results of reflection in the implementation of the Internship program 1 and the increase of students commitment in equipping themselves as a candidate of teacher in Non-Formal Education FIP Unimed. This study was conducted in Non-Formal Education study program with the entire student of academic year 2016/2017 as population which amount 79 people, all of them have done Internship program in 10 (ten) locations (PKBM) and the research sample is determined by total sampling technique. Data of this research were collected by using questionnaire instrument with Likert Scale pattern. The results of this research will be processed by using correlational descriptive technique. By performing normality and homogeneity test variables, test requirements analysis and test the hypothesis by using t test. The research result shows that (1) the perception about the implementation result of Internship program 1 in Non-Formal Education study program is quite enough with an average score of 3.89, (2) Students’ commitment to equip themselves to be a teacher in Non-Formal Education FIP Unimed is high with an average score of 4.19. Based on the calculation of correlation analysis between variables, obtained $r_{xy}$ price of 0.496 which is significant at the level of 95%, so it is concluded that there is a correlation between the perception about reflection result to the implementation of Internship program 1, it has a positive relationship with the increase of students commitment in equipping themselves as a candidate of teacher in Non-Formal Education FIP Unimed which significant at 95 percent. The contribution is 24.6 percent. The findings of this study are enough to give sign that Internship program 1 has the benefit to the establishment of the right perception of self-educator candidates or educational personnel should have a high commitment in equipping themselves to be the professional teachers based on their field of science in college.

Keywords: Perception, reflection, internship program, commitment

1 Introduction

Non-Formal Education Students is expected to have a commitment or determination or a promise to do all the activities that have been determined by study program. Lecture activities that must be undertaken by students has been designed in such a way by educational
institutions ranging from the central level (University), the faculty level, the study program level to the lecturer level who developed courses in each course. One of the compulsory subjects that were held in the sixth semester, as an opportunity for students to practice theories learned in college in schools or educational units, such as studio, courses, etc., is the Internship program.

The main tasks of the students in the Internship program include (1) Internship 1, that is direct observation of school culture, teacher competence, students, PBM and the last is the reflection of observation results (2) Internship 2, the Stages of studying the practical aspects of school curriculum and its application in the classroom associated with lectures in Unimed, the main tasks of the students include studying curriculum and learning tools, SBM, Evaluation System, designing lesson plans, teaching materials, media and Evaluation tools, (3) Internship 3, the stage of making lesson plans and the implementation based on the relevance to lectures in Unimed, student's duties include becoming a teacher assistant, teaching, doing the task to accompany the students and the extra-curricular activities.

The policy to determine the three stages of Internship is based on the idea that the competence and spirit of the teachers is not only formed by the experiences and education, but also required a long process, so it needs early exposure, that is giving the experiences as early as possible to the candidate of teachers with the Internships at school (institution / educational unit) in stages. The Internship 1 program has been attended by the students, especially in Non-Formal Education study program FIP Unimed amount 79 people in 10 (ten) locations (PKBM Generasi Muda, PKMBM Walidayna, PKBM Hanuba, PKBM Laskar Pelangi, PKBM Panca Sakti, PKBM Al Manar, PKBM Merah Putih, PKBM Agape, PKBM Sampe Maju and PKBM Karya Muda).

The stages of the implementation activities have been done as it should be by students, lecturers and units of institutions / educational units where the Internship held. Students prepare reports on the implementation of Internship 1 which is passed by the supervising lecturer and PKBM management. The score obtained by the student has been reported in the List of Participants and the Final Value (DPNA). Students can give and analyze the internship result and then make it into reflection result. Based on the reflection result can be known what and how the response or students' perception in the future to prepare themselves to become teachers as it has been formulated on the vision, mission and the objectives of the study program.

The extent to which students' reflection on Internship 1 can determine or influence their commitment in continuing their efforts to prepare themselves to become candidates of teacher and educational staff, in the study program needs to be scientifically studied through scientific research entitled "Perception About the Implementation Result Of Internship Program 1 And The Relationship With The Student Commitments Relating To Be A Prospective Educational Candidate".

1.1 The Problems of Study

Based on the background of study above, the problem of study can be formulated as follow:

a. How is the students' perception about the reflection of the internship program 1 in Non-Formal Education study program?

b. How is the students' commitment equip themselves to be a teacher in Non-Formal Education FIP Unimed?

c. Is there correlation between the results of reflection in the implementation of the Internship program 1 and the increase of students’ commitment in equipping themselves as a candidate of teacher in Non-Formal Education FIP Unimed?
1.2 The Objectives of Study

Based on the problem of study above, the objective of study are:

a. The students’ perception about the reflection of the internship program 1 in Non-Formal Education study program.

b. The students’commitment equip themselves to be a teacher in Non-Formal Education FIP Unimed.

There is correlation between the results of reflection in the implementation of the Internship program 1 and the increase of students’ commitment in equipping themselves as a candidate of teacher in Non-Formal Education FIP Unimed.

2 Methodology

2.1 Student Commitment

Commitment is a term that is often be a topic of discussion both among scientists and laity. This commitment comes when a person or group of people agrees to do something that has been agreed upon before. The word commitment comes from English-commit, which means doing, commitment means making promises and responsibilities [1]. It means commitment can be seen as the basis of relationship and / or fostering relationships between individuals with each other, between individuals with groups, between groups of one with other groups.

In the world of learning, the term commitment is always a study in an effort to develop the learning activities can be achieved effectively and efficiently, so that the concept of student learning commitments or student learning commitments. Students who have a learning commitment are those who know, understand, be able to accept all the design of learning activities that have been set by colleges (universities, faculties, majors and courses) and determined to make it happen by doing these activities seriously and fully responsible.

Students as learners face directly with a number of tasks and obligations that have been formulated in such a way by the majors/courses on lecture tools such as curriculum, syllabus, lecture implementation plan (RPP), and other lectures, the principle of effective learning through the assistance of educators (lecturers) and professional staff in each field. This is in accordance with the opinion of [2] which states that commitment is the steadiness of the will, determination of attitude, and determination, to do better, to no longer repeat his wrongdoing or breaking it; will not do the same in the same place or elsewhere. This means commitment concerns the willingness, ability and determination of learners to do in accordance with the values or norms set by the group or organization.

Based on the opinion of some experts above can be said that the commitment of learning related to the attitude of the students promised to themselves and educational institutions to perform all rules and regulations that have been jointly established within the organization with good and full responsibility. As an attitude, learning commitment can be defined as a strong desire of learners to accept the values and or goals of the organization. [3] explains that organizational commitment can be defined as (1) a strong desire to remain as a member of a particular organization, (2) a desire to strive according to the will of the organization, and 3) certain beliefs and acceptance of organizational values and goals, it can be synthesized that
students' learning commitments illustrate how students express their loyalty to the institution / study program through their attitude and / or behavior in carrying out their learning activities.

The characteristics of student learning commitment can be illustrated by analyzing Porter's opinion in [4] regarding organizational commitment characterized by three things: (1) acceptance of organizational values and objectives; (2) readiness and willingness to strive earnestly on behalf of the organization; (3) loyalty, that is the desire to remain as a member of the organization. Thus it can be said that the display of attitudes and learning behavior of LPTK students who have a commitment to learning are illustrated in (1) acceptance of norms and goals of study program, (2) readiness and willingness to carry out all duties and obligations of lectures seriously, (3) the determination to remain as a student in the study program to achieve the final goal, complete the study, ready to become a candidate of teacher at the institution of human resources empowerment that has been waiting in the community.

2.2 Perception of the Internship Reflection

Perception is one of the abilities that a person has to give meaning to something object or information. [4] defines perception as "the experience of objects, events, or relationships obtained by inferring information and interpreting messages".

Individual perception of some stimuli will take place in such a way based on certain principles or propositions. Some theories of perception, which Rachmat quotes from Krech and Crutchfield [4] formulate the first argument of perception: "Perceptions are selectively functional". This first premise explains that objects that are under pressure in our perceptions are usually objects that meet the goals of the individual who is perceptive.

Based on the description theory above can be said that the perception is a response or interpretation of a person against all that is felt or experienced and faced in his life. Thus, it can be mentioned also that student perception is response or interpretation of student to all that perceived or experienced in its lecture activity, such as perception on obligation to complete the six tasks, do extracurricular in the form of Student Creativity Program (PKM) by following the three stages of internship through the internship course and so on.

One course that needs to be perceived correctly by the students is the implementation of field practice courses or internships. Internships are generally interpreted as part of a system of on-the-job training held in an integrated manner between training in training institutions by working directly under the guidance and supervision of instructors or workers who are more experienced in the process of producing goods and services in the company, in order to master the skills or certain skills (Regulation of the Minister of Manpower and Transmigration No. Per. 22/Men/IX/2009 on Implementation of Internal Internship). This internship is usually done by students at the end of the completion of the lecture or vocational school (SMK) grade 3 as one of the main requirements to complete the education process (http://www.gajimu.com/main/tips-karir/sistem-magang-di -Indonesia). While job training is usually followed by a workforce who has signed a contract with a company or a particular institution in order to develop the competence and productivity of employees.

Internship at the top of the university level, especially at Medan State University (Unimed) has made fundamental changes in the application of the curriculum based on the Indonesian National Qualification Framework (KKNI), making it an internship for educational and non-educational programs. To education study program, the existence of internship course is intended for the internalization of teacher characters since the beginning of the teacher candidate decides the choice as a teacher, while for non-subject courses this course is expected to be a vehicle to introduce the world of work and profession for students according to their respective fields.
The Non-Formal Education study program addresses this course by designing the implementation of internship courses in the scope of the activities by introducing various fields of Non-Formal education profession to the students. This internship program is a compulsory subject for FIP Unimed with three stages: (1) Internships 1, (2) Internships 2, and (3) Internships 3. Each stage has its own scope of achievement, because each stage of the internship also has different pre-graduation courses.

Internship program in Internships 1, 2, and 3 for students of Non-Formal Education study program aims to:

1. Extending student insight into the professional world of teachers/tutors by providing opportunities to experience directly the implementation of activities in PKBM.
2. Providing opportunities for students to establish networking with PKBM leaders, teachers/tutors in PKBM.
3. Giving experience to students to know firsthand management of PKBM, PKBM physical, studying citizen, socio-cultural of PKBM.
4. Applying theoretical knowledge into the world of practice so as to foster knowledge of work to fit the background of the field of student science.
5. Training the ability of students to be good individuals who are independent, able to behave, able to solve problems and make decisions in work.
6. Growing the ability to interact socially with others in the world of work.

The internship program designed in the Unimed curriculum can benefit many parties, especially students, who include:

1. Students can apply and improve the knowledge gained in the lecture bench.
2. Improving the ability of students in mastering the competence of the accountant profession gradually.
3. The opportunity to form self-confidence, because it can add and improve skills and professional skills.
4. Gaining understanding, appreciation and experience in the field of science.
5. Gaining experience through observation of the process of establishing accounting competence.
6. Gaining experience and appreciation through observation of the learning process in the classroom.
7. Gaining experience on how to think and work interdisciplinary, so that it can understand the existence of the relationship of science in overcoming the problems.
8. Acquire reasoning ability in conducting the review, formulation and solving profession problems in the field of knowledge that is involved in the business world.

The objectives and benefits of internships above, especially the Internship 1, will be achieved if the student can work with the directly related parties between the study program and the institution/unit of education where the Internship 1 is held. Various activities that must be done by students in Internships 1 so that students have a correct understanding, accurate about the world of work that they will be doing after completing the lectures in the choice program. The learning activities to be undertaken by the students at the Internship 1 have been designed in such a way by the university and study program, which includes observation (1) non-formal education management culture, (2) educator competence, and (3) learning process at the place of Internship 1 (PKBM).

In conducting the activities of Internships 1 above, educational institution, Unimed and study program have developed an instrument of observation that students can use during their stay at the internship.
2.3 Analytical/Theoretical Work

The formation of a professional educator and educational staff is initiated from one's intention to become a professional educator and educational staff itself. This intention will be a strong motivation to endeavor to conduct any activities established by the self or outsiders directly related to the embodiment of what is intended. If a person has an intention become a teacher, then the intention will be the trigger to do everything related to the manifestation to be a teacher. The determination to do everything sincerely, earnestly and responsibly to realize what is intended can be called as committed commitment or learning commitment for learners (students).

LPTK student's commitment to learn to make themselves as teachers or educational staff is encouraged or determined by many factors both from within themselves and from outside. If the factor from outside, that is the institution/ study program that is chosen in the form of the provision of various types and level of lecture activities as outlined in the curriculum, syllabus, RPP that must be done by the students, the perception factor from within the students will determine how to behave and implement all kinds and levels activities programmed by the study program.

Internship 1 is a type and an activity level or lecture program designed by LPTK institution (Non-Formal Education study program) to be implemented by the students. How students conduct Internship 1 will provide a variety of predictable learning experiences that will create an impression or self-perception on students about what, why, why, where LPTK graduates will later dedicate their life as educators or educational staff. Moreover, the Internship program 1 gives the students a chance to reflect on the activities during the follow up or perform the Internship 1. The results of reflection can be a determinant for students to think, analyze and resume commitment to continue his intention to finish his studies on the choice program.

Non-Formal Education students who have positive perception on the reflection result of Internship program 1 can be predicted to have high learning commitment, which is determined to prepare themselves to be educator and educational staff by accepting and implementing all lecture program activities that have been designed in such a way by the study program stages of the next lecture until it receives a pass mark (diploma) and is ready to serve in the community. Based on the above mindset can be synthesized that the perception about the reflection result of the implementation of the activities of Internships 1 has a positive relationship with the commitment of students prepare themselves as prospective education personnel based on the course of his choice.

Fig. 1. There is a positive relationship between perceptions about reflection results on the activities of internship 1 with the students' commitment in preparing to be a candidate of teachers in Non-Formal Education study program FIP Unimed.

2.4 Research Hypothesis

Based on the theoretical framework and the above framework, the hypothesis proposed in this study is formulated as follows "There is a positive relationship between perceptions about reflection results on the activities of internship 1 with the students' commitment in preparing to be a candidate of teachers in Non-Formal Education study program FIP Unimed".
The type of research used is descriptive quantitative research. It is designed to prove whether there is a significant relationship between perceptions about the reflection results on the activity of Internship 1 with the students’ commitment in preparing themselves as a prospective teacher in Non-Formal Education study program with the design of the research work activities as follows.

This research was conducted four months from July to November 2017 in Non-Formal Education study program FIP Unimed for students from even semester academic year 2016/2017, with all students as population who have followed the Internship program 1 which amounted to 75 people with a sample of research as much as 75 people.

This research instrument used questionnaire in the form of Likert Scale. The data obtained in this study were analyzed descriptively by calculating the average price, standard deviation, variance, frequency distribution, mode and median and histogram of each variable. While Parametric statistics used are (a) Normality Test calculated by Liliefors formula, (b) Homogenity Test, (c) Linearity Test and Simple Regression Meaning, (d) Correlation Coefficient Test by using Product Moment formula.

3 Result and Discussion

The results of data processing research for each variable can be summarized in Table 4.1 below:

<table>
<thead>
<tr>
<th>No</th>
<th>Descriptive Analysis</th>
<th>Variable</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Amount of Data (N)</td>
<td>75</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Maximum Score Ideal</td>
<td>145</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ideal Minimal Score</td>
<td>29</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>High Scores</td>
<td>148</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Lowest Score</td>
<td>94</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Mean (Average)</td>
<td>112,95</td>
<td>104,73</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Deviation Standard</td>
<td>9,93</td>
<td>9,43</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Modus</td>
<td>112,08</td>
<td>105,64</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Median</td>
<td>112,12</td>
<td>105,02</td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 4.1 above can be seen the amount of data, highest score, lowest score, mean, deviation standard, mode and median of each research variable. In detail, the data of each variable can be described as follows:

3.1 Perceptions on reflection results on the implementation of internship activities 1 (X1)

Distribution of frequency and tendency of perception variable data about the reflection results on the implementation of internship program 1 (X1). Based on the data above can be seen that the perception variable data of the reflection results in organizing Internships program 1 (X1) tends to be enough, it means that students of internship 1 have a perception that is good, no less or less.
3.2 Students’ Commitment in Equipping Themselves to be a Candidate of Teacher in Non-Formal Education Study Program FIP Unimed

Distribution of frequency and tendency of variable data Students' Commitment in Equipping Themselves to be a Candidate of Teacher in Non-Formal Education Study Program FIP Unimed. Based on the data above, it can be seen that the variable data (Y) of students’ commitment in equipping themselves to be a candidate of teacher in Non-Formal Education Study Program FIP Unimed belongs to the high category, it means that the students have high commitment in equipping themselves to be prospective educators in Non-formal Education study program.

3.3 Results of Requirements Analysis Test

The requirements data analysis testing in this study is the normality test, linearity test and significance regression line. Homogeneity test is not necessary because the respondent does not do special treatment.

To obtain the normal data distribution from each research variable, normality testing is done by using Lilifors formula. The data for each research variable is called normal distribution, if the calculation result is smaller than Ltable with 5% significance level. Summary of Result Normality test of each variable can be seen in Table 4.4 below.
Table 2. Summary of Normality Test Results

<table>
<thead>
<tr>
<th>Research Variable</th>
<th>L_count</th>
<th>L_table (α = 0.05) (N = 45)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variabel Y over X</td>
<td>0.053</td>
<td>0.102</td>
</tr>
</tbody>
</table>

Based on the table above, it can be seen that L_count of all variables are smaller than L_table (L_count < L_table). It can be concluded that the distribution of variable data of students’ commitment in equipping themselves to be a candidate of teacher in Non-Formal Education Study Program FIP Unimed(Y) on Perception about reflection result on Internship program 1 (X), normally distributed.

3.4 Linearity and Simple Regression Test

This test is used to find out whether or not linear relationship variable X to variable Y as a condition to use statistical techniques and regression analysis. Summary of significance test of regression coefficient and linearity for variables Y and X can be seen in Table 4.5 below.

Table 3. Overview of ANOVA Results Variable Y over X

<table>
<thead>
<tr>
<th>Source</th>
<th>Dk</th>
<th>JK</th>
<th>KT</th>
<th>Fhit</th>
<th>Ftab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variation</td>
<td>75</td>
<td>829261</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient a</td>
<td>1</td>
<td>822680.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regression</td>
<td>1</td>
<td>1614.89</td>
<td>1614.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rest</td>
<td>73</td>
<td>4965.78</td>
<td>68.02438</td>
<td>68.02438</td>
<td></td>
</tr>
<tr>
<td>Suitable Tuna</td>
<td>28</td>
<td>2082.74</td>
<td>74.38357</td>
<td>74.38357</td>
<td>1.607143</td>
</tr>
<tr>
<td>Error</td>
<td>45</td>
<td>2082.74</td>
<td>46.28311</td>
<td>46.28311</td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 4.5 above, it can be seen that F_table (dk: 1:75) is 7.19 while F_count is 1.61. Apparently F_count < F_table (1.61 > 7.19) so it can be concluded that the regression equation Y = 51.51 + 0.47 X is linear at α = 0.05.

3.5 Results of Calculation Correlation Analysis among variables

The results of calculation of correlation coefficient between variables of this study are stated in Table 4.5 and the results of the calculation of path coefficient in Table 4.6.

Table 4. Summary of the Correlation Coefficient Results (r)

<table>
<thead>
<tr>
<th>Relationship Variable</th>
<th>Correlation</th>
<th>t N=73; α = 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>X over Y</td>
<td>0.496</td>
<td>4.87 &gt; 0.166</td>
</tr>
</tbody>
</table>

Based on the data in Table 4.5. above can be seen that the price of the correlation coefficient between variables X with variable Y reached 0.496. After test of significance of correlation coefficient by using t test, obtained t_count equal to 4.87, while price t_level 0.05 equal to 0.166, so t_count > t_table (4.87 > 0.166), it means the correlation coefficient between perception variable about result of reflection Organizing Internship Activities 1 (X) with students’ commitment in equipping themselves to be a candidate of teacher in Non-Formal Education Study Program FIP Unimed(Y) is significant at 95 percent level.
3.6 Hypothesis Testing

Based on the calculation of correlation coefficients mentioned above, the hypothesis proposed in the study stating that "there is a relationship between Perceptions of Reflection Results in Organizing Internship program 1 with the students’ commitment in equipping themselves to be a candidate of teacher in Non-Formal Education study program FIP Unimed "stated" received.

3.7 Discussion of Research Results

The students’ commitment in equipping themselves to be a candidate of teacher in Non-Formal Education study program FIP Unimed in this research is a variable that is determined by other variables called dependent variables. While the perception variable about the result of reflection on the implementation of the Internship program 1 is the independent variable that can determine the existence of the variable the students’ commitment in equipping themselves to be a candidate of teacher in Non-Formal Education study program FIP Unimed.

The findings of this study explain that the perception of students on the results of the reflection of the implementation of internship program 1 tends to be quite (good). With the level or level of perception can have a significant relationship with the commitment of students continue their efforts to equip themselves to become prospective teacher in Non-Formal Education study program later. This finding is enough to indicate that in order for students’ commitment to make themselves as good educators in the future, the Internship 1 program and its advanced internships need to be designed and implemented in such a way effectively that it can lead to positive perception on students that the internship is a program that gives opportunity to them to experience (directly) the implementation of teacher profession performance (educational staff) so that they can grow their commitment to continue to pursue the profession in the program of study which has become the previous choice. Efforts that can be developed in improving student perceptions of the activities of apprenticeship is certainly not separated from the results of data analysis on each indicator of the perception itself.

4 Conclusion

Based on the results of the research data analysis can be drawn several conclusions research as follows:

a. Students’ commitment in equipping themselves to be a candidate of teacher in Non-Formal Education study program FIP Unimed tend to be high and sufficient with 98 percent achievement.

b. Perceptions on the reflection results on the implementation of internship program 1 in PKBM is quite high enough to reach 100 percent.

c. Perception of the reflection result on the implementation of internship program 1 has a significant positive correlation with the Students’ commitmentin equipping themselves to be a candidate of teacher in Non-Formal Education study program FIP Unimed with a significant correlation coefficient of 0.496 at 95 percent level.

d. Contribution of Perception on reflection result on the implementation of Internship program 1 in PKBM on the Students’ commitmentin equipping themselves to be a candidate of teacher in Non-Formal Education study program FIP Unimed reached 24.60 percent.
Based on the conclusions of the above research, the following suggestions can be drawn as follow:

1. The Internship program in Unimed should be designed in such a way that it can form the best perception among students.
2. The service of Internship program held by Unimed with PKBM and other educational institution should be more professional so it makes the students aware about the important meaning of the internship

References

Avoiding Gadget Addiction in Children by Helping Children to Develop Talents and Interests

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Abstract. Technology plays important role in people’s lives. Since gadgets are popular in children, it brings both positive and negative impacts for children. The serious negative impact is causing gadget addiction in children. This problem needs to be solved soon in order to avoid further negative impacts in the future, like health issues, social isolation, lack of interest in studying and negative impact on character. One of the effective ways to avoid gadget addiction is by helping children to develop their talents and interests to prevent children from gadgets overuse. Both parents and teachers have essential role in solving this problem. Both of them should provide positive activities that lead children to discover and develop their talents and interests.

Keywords: Gadget addiction, talent, interest

1 Introduction

Nowadays technology plays important role in people’s lives. Technology leads the way to amazing advancement in numerous fields, it is helpful in education, research and almost in every aspect of life. As the gadgets are increasing and becoming so popular day by day, it brings many positive and negative impacts too. It makes people easier in doing activities and it is also leading to the technology addiction among people, both adult and children. Its addictive effects have become a growing concern, many adults and children waste their time on games and applications.

According to many researches, children spend average of time on gadgets, like smartphone, tablet, computer, TV, Xbox, PlayStation and so on. They spend their time to playing games, watching movies, chatting with friends, listening songs and browsing in internet. Children as young as 2 years even use gadgets with great ease. They learn easily by imitating their parent’s behavior. Tons of parents use gadgets and sometimes it makes them ignore their children in front of them because they are too busy to use gadgets, whether for working or just for having fun. For some busy parents, they give gadgets to children to make them calm down and behave, so parents can do another activity without being interrupted by their children. Without them realizing, this behavior can make children become addicted to gadgets. Some children will be hysterical and restless when they cannot get it from parents.

Gadget addiction in children also become a serious problem that occur in society nowadays. Many children tend to play gadgets and spend many hours just to play games and application rather than socialize with others. It makes them being anti-social, because they find their happiness in virtual world nor in real world. It is such a modern era phenomenon where children prefer use gadgets as their playground instead of playing outside with friends.
Furthermore, children also spend most of time using gadgets and don’t pay attention to their health.

Addiction is a serious problem. It needs to be solved soon in order to decrease further serious effects in the future. Hence, there are various adverse effects of gadget addiction. People also need to know the importance of prevention that is carried out on gadget addiction, so it is very important to know the problem solving in helping children not to become addicted to gadgets.

2 Methodology

2.1 The Negative Impacts of Gadgets for Children

There are many negative impacts that arise from excessive use of gadgets, such as health issues, social isolation, lack of interest in studying, negative impact on character and so on.

a. Health Issue

Health issue become one of serious effect caused by gadgets. Children spend most of time using gadgets and don’t pay attention to their health, the screen brightness, screen distance and duration of usage actually will be affected to vision and health. Spending too much time in gadgets can cause eyes irritation and hearing problem, lay down at home and worse of all, apart from lacking in physical activity. Gadgets also make children become aggressive. Some children will be more emotional when they cannot find gadgets around them and get paranoid when they do not have gadgets with them.

b. Social Isolation

Social isolation is related to the lack of mutual interaction with other peoples and social activities face to face directly. Gadgets make children tend to spend time by playing games and having their own world rather than having real communication with family or friends. It causes anti-social problems. [1] states that because of the solitary nature of most computer activities, concerns have been raised that children might form “electronic friendships” with the machine, instead of friendships with their peers, hindering the development of interpersonal skills.

c. Lack of Interest in Studying

Excessive use of gadgets because children become lazy to study and they also lose their interest to study. They prefer to choose playing gadgets to studying. They would rather rely on gadgets and internet, instead of their books and the input from their teachers, because of gadgets addiction. Gadgets also make them lose their concentration due to lack of sleep and tired, because some stay up late to use gadgets.

d. Negative Impact on Character

According to [2] gadgets can bring negative impact on character. This is one of the biggest problems in this growing world of technology. Children use internet to see adult content rather to search for educational websites. This practice leads bad impact on their character, they forgot their moral values. The negative contents are easily to find on internet, because there are so many websites provide negative contents that can be accessed by
2.2 The Efforts to Prevent the Gadget Addiction in Children

Parents have essential role in helping children to prevent the gadget addiction. Some children get addicted to technology since they start living in environment where their family or even parents serve them with tons of gadgets. They feel better by playing gadgets all day long instead of doing other activities outside. Parents should know and understand that the importance of children’s healthy development involves social interaction, creative imaginative play and an engagement with the real, natural world. Parents must help children to divert children's attention from gadgets and it can be done in the following ways:

a. Being a Role Model

Children is a great imitator. They imitate adults’ behavior. They see and observe them, then imitate and apply it. If they see their parents read a book, they are more likely to read and if they see their parents play gadgets, they will ask them for it. If parents did something good, they will be good and if parents give bad examples, they will do the same things. As a parent, never play the gadgets in front of children, in order to avoid them from the gadget addiction.

b. Be Involved in Children’s Lives

Parents can take wise decision by spending more time with children. Children who are found to be lonely are more likely to look for a sort of companionship in gadgets. For many parents, it is just easier to turn on the gadgets rather than to be involved in their children’s lives. Good parents should be a observer, listener and teacher for successful parenting.

c. Encourage Positive Activities

Parents have to provide positive activities for children, such as playing football or chess, drawing, coloring, reading books, playing piano and so on. Therefore, parents should provide the necessary resources, like books to read, board games, art supplies, sport equipment, so that children can have many things to do.

d. Ask Children to Play with Friends

One of the reasons why a child playing a gadget because there is no fun activity to play with friends. So that, parents need to ask children to play with their peers, by inviting friends to play at home or asking them to visit friend's house at school. With a lot of friends, children will have a new activity and can forget the gadget.

3 Result and Discussion

There are many ways to avoid children from gadgets’ addiction, but the best way is by helping children to find their talents and interests in order to make them be more creative. Every child is special in their own way. Each has own talent and interest who make them special. Unfortunately, some children and even adults do not know their own talent, because some people never try to find it or some knows it, but has no desire to develop it. As Wolfgang Riebe’s proverb, “Everyone is gifted, but most people never open their package”. 
There seems to be a difference in talent and interest in psychology that can be a guideline for knowing specifications that are typical of talent or interest. Both are often considered the same or difficult to distinguish. Some say that real talent can be nurtured, while interest will depend heavily on talent. The talent in general is also identical to the abilities that a person has since he/she was born. A person may have certain abilities that are inherited from their parents. Meanwhile, interest is the desire of someone to learn something that is his favorite or favorite. Interest and talent when combined will be a very good thing in supporting one's goals and ideals.

a. Definition of Talent

Every child has own talent that should be developed since early age to make them to be more optimal and creative in the future. Euis states in [3] elaborates talent as innate ability, as a potential that still needs to be developed and trained in order to materialize. In this case talent requires training and education so that an action can be done in the future. Achievement is a manifestation of talent and ability. A very prominent achievement in one field reflects superior talent in the field. In simple terms, it can be concluded that talent is a potential innate ability which still needs to be trained and developed, so that it can become a capable ability and skill.

[3] says, “Some experts tend to distinguish talent based on general talent and special talent. Gifted is interpreted as intellectual talent (both public and special) and talent as special talents, for example in the art of music or fine arts. These talents, both potential and realized ones, include: (a) General intellectual ability, (b) Special academic ability, (c) Ability to think creatively-productive, (d) Ability in one field of art, (e) Psychomotor /kinesthetic ability and (f) Psychosocial ability or leadership talent”.

b. Definition of Interest

[4] explains that interest is an attitude that goes on continuously that is able to make a person's attention pattern so that he becomes selective about the object of interest. In simple, interest means a high tendency and passion or a great desire for something. Interest can be related to the power of movement and the motivation of someone to tend to feel attracted to people, things, activities or can be an effective experience stimulated by their own activities. Interest can be a cause of participation in an activity. Interest is very personal, even though it is very personal, interest is influenced by the environment. Everyone must develop their interests.

According to Slameto in [3], the characteristics of interest that exist in each individual are as follow: (1) Interest is not taken from birth, but it is formed and learned later, (2) Interest can be expressed through a question that shows that students prefer something more than anything else, (3) Interest can be manifested through participation in an activity, (4) Interest in terms of motivation and feeling. Children who have an interest in an object will tend to give greater attention to the object.

c. Ways to Discover Children’s Talents and Interests

Everyone certainly has the ability which comes from within themselves which can be derived from parents or indeed a natural talent that someone has. Of course, as a parent, it is important to know the talent of children from an early age so that you can direct the best possible talents, so that they are maximized along with the development and growth of the child. Here are several ways to find out child's talent from an early age that can be done by parents. 1) Paying Attention to the Children’s Habits and Passions. The first way to find out
what child has is to pay attention to children's habits and passions. Usually things that become habits and favorites can be a talent that your child has. So, try to pay attention to all the children's activities, maybe one of them is a talent or potential that is strong enough to be explored further. Starting from habits, preferences, hobbies, things that are often done, interests and everything parents need to pay attention to. 2) Allowing Children to Explore Abilities. Parents should let children to try a variety of positive things, in this way will help the children find the hidden talents in them and it also can avoid children from play gadgets. As a parent, do not occasionally limit children's activities. Preventing children from exploring their abilities will make them unable to maximize to find hidden talents in themselves. Parents have to do is to supervise all the children’s activities, if later there are things that a child likes, parents can direct them further. 3) Entering Children into Several Competitions. Another good step that parents can do is to include children in several competitions, but remember all these things must be in accordance with the children's agreement. Parents can observe the talents and interests of the children from the competition that children follow. The results of the race that has the highest achievement can be an indication if the child's ability is more dominant in that. When entering children in the competition, parents should not give too high targets that will only make children become depressed. Children will not perform maximally, because they only will be burdened with the target that parents have set. The wisest thing is to accompany children when they take part in the competition by giving a lot of positive reinforcement that can strengthen children.

[5] says “The success of early childhood education will depend on whether it can connect the learning environments of home and school. It should be built on the interaction and communication between children, teachers and parents”. So that means the effort of parents and teacher are needed to help children in developing talents and interests as a way to avoid the gadget overuse by children.

4 Conclusion

Nowadays the gadgets addiction become a serious problem. It needs to be solved as soon as possible in order to avoid further negative effect in the future. Parents have important role to help children to divert children’s attention from gadgets and direct them to do more positive activities. The most positive way is by helping children to discover and gain their talents and interest. Many cases where parents can misunderstand the talents that children have so that they ask the child to do an activity without communicating first with the child. This is a matter that must be avoided because it can make children even have difficulty finding the talent they have. For this reason, parents should give children the freedom to be able to choose, play and do their own things. As long as it is still reasonable and has a positive impact, then parent have to support it. Do not forbid children to do something that can make children's talents develop. But if the activity has a negative impact on child, then parents can provide a good explanation and understanding so as not to continue this.

Parents can also find out the talents owned by children through consultation with the teacher at school, especially with class teachers. This is because the class teacher has the task of educating and teaching children every day at school. Moreover, as much as a child's time is spent in a school environment, so most teachers certainly know and understand the hidden talents of children. In addition, the class teacher also understands what are the weaknesses and strengths to the talents of child. Therefore, parents can try to consult with the teacher about the
talents owned by the child by discussing them. Once children have found their talents and interests, they will be busier and happier to develop their talents and interests rather than play gadgets all day long. This is also be an effective way of parents to prevent gadget overuse by children and it can be a solution to avoid children from negative impact of gadgets.

References

The Effect of Current on Shear Strength and Nugget Size in Resistance Spot Welding of SCGA270D-45 sheet metal

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2 Universitas Islam “45” (UNISMA) Bekasi

Abstract. The objective of this paper is to present the effect of current on shear strength, nugget size and to determine the optimal current for spot welding SCGA270D-45 sheet metal of 0.8 mm thickness. The experimental steps conducted in the research were preparation of specimens, spot-welding process with variation of current 10.5 kA, 11kA, 11.5kA, 12kA, and 12.5 kA; specimen testing; analysis and conclusion. Shear strength test was conducted by using tension machine and nugget size test by using Chisel test. Based on the research, it was found that the current variation has affected the shear strength and nugget size with highest current 12.5 kA resulting shear strength 167.1 MPa and nugget size 7.3 mm; the lowest current of 10.5 kA with 121.2 MPa and 1.7 mm of shear strength and nugget size respectively. The optimal current for spot-welding SCGA270D-45 material with thickness 0.8 mm is 11 kA for components belong to A-category as per requirement of Toyota Engineering Standard TSH5600G.2012. Spot Welding.

Keywords: Resistance spot welding, shear strength, nugget size, Methodology SCGA270D-45 sheet metal

1 Introduction

Resistance spot welding is the common method widely used to join sheet metals, particularly in automotive industry. Typically, there are about 2000-5000 spot weld in a modern vehicle [1]. There are three main parameters which control the quality of resistance spot welding namely: current, pressure and time [2]. In this paper, it will be presented the case of resistance spot welding which was found in automotive industry, that is the problem of joining the components of body and panel. The problem is regarding the quality of joining was not so good that the spot-welded components made of material sheet were broken. Therefore, improving the quality to meet standard as required by conducting experiment, is of great importance.

2 Methodology

The flow of research is roughly depicted as shown in Figure1.
The research was starting from specimen preparation, then conducting spot welding process by applying variation of current 10.5 kA, 11kA, 11.5 kA, 12kA and 12.5 kA. After the welding process, the specimens were then tested using tension-shear and Chisel tests. After the tests, conducting analysis and finally drawing conclusion.

2.1 Material preparation

Material used in this experiment, is SCGA270D-45 sheet, thickness 0.8 mm and dimension as standardized by Toyota Engineering Standard TSH5600G Spot Welding, is as shown in Figure 2.
2.2 Equipments
   a. Shearing machine
   b. Welding machine
   c. Tension test machine
   d. Chisel test
   e. Digital camera
   f. Vernier caliper

2.3 Experimental procedure
   The material sheet SCGA270D-45 with 0.8 mm thickness was cutted by using shearing machine in accordance with table 1, namely for thickness 0.8 mm, width 30 mm and Length 100 mm. The quantity of specimen used for each test was 3(three) pcs per each current variation. The result of the experiment was taken as average of the three specimens.

   The respective sheet was then welded by spot-welding machine. The sheet condition was, before and after being welded, shown in Figure 2.

   The result of spot welding process was then tested using Chisel-test, to determine the nugget size. The nugget dimension was subsequently measured and compared to standard of Toyota Engineering Standard TSH5600G Spot Welding with regard to quality as required by company. In addition to Chisel test, it was also conducted Tension-shear test to measure the strength of specimen as a result of spot welding.

![Material sheet before and after spot welding](image)

Fig. 3. Material sheet (a) before spot welding and (b) after spot welding

3 Result and Discussion

   The chemical composition and mechanical properties of sheet is shown in Table 2.

<table>
<thead>
<tr>
<th align="left">Table 2. The chemical composition and mechanical properties SCGA270D-45</th>
</tr>
</thead>
<tbody>
<tr>
<td align="left">YS (N/mm²)</td>
</tr>
<tr>
<td align="left">167</td>
</tr>
</tbody>
</table>

   The parameter used during spot welding process is shown in Table 3.

<table>
<thead>
<tr>
<th align="left">Table 3. The parameter in spot welding</th>
</tr>
</thead>
<tbody>
<tr>
<td align="left">No</td>
</tr>
<tr>
<td align="left">1</td>
</tr>
<tr>
<td align="left">2</td>
</tr>
<tr>
<td align="left">3</td>
</tr>
<tr>
<td align="left">4</td>
</tr>
<tr>
<td align="left">5</td>
</tr>
</tbody>
</table>
Based on the graph 1, it can be seen that the increase of current resulted the increase of nugget size. Heat transfer is a function of time and the development of the nugget size requires a minimum length of time, regardless of amperage [2]. As the current control the heat generated according to the equation \( Q = I^2Rt \), the heat has influenced on the nugget diameter.

In graph 2, it is shown the correlation between yield strength and current, that the increase of current has increased the yield strength. The highest current 12.5 kA has influenced on shear strength 167.1 MPa and nugget size 7.3 mm and the lowest one 10.5 kA has affected 121.2 MPa and 1.7 mm of shear strength and nugget size respectively. The result of this experiment is in line with previous one showing that increase of welding current magnitude has affected the increase of shear strength.

In graph 3, the increase of current has caused the increase of tensile load, which is the highest load 4.1 kN obtained as a result of 12.5 kA.
As can be seen in table 4, the minimum nugget size for sheet 0.8mm is 4.5 for A-category and in Table 5, the minimum tensile load for the respective sheet is 3.23 kN.

Referring to required standard of company as mentioned in [3], shown in table 4&5 and referred to graph 1 & 3 as a result of the experiment, it can be seen that the optimum current for spot welding process for this material sheet 0.8mm, is 11kA. The macro appearance of the specimens applied to 11 kA is shown on Figure 3, which qualitatively remains acceptable under standard as required by company.

**Table 4. Nugget Diameter (minimum).**

<table>
<thead>
<tr>
<th>Sheet thickness (mm), T</th>
<th>A category</th>
<th>B category</th>
<th>C category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>3.5</td>
<td>2.8</td>
<td>2.1</td>
</tr>
<tr>
<td>0.6</td>
<td>3.9</td>
<td>3.1</td>
<td>2.3</td>
</tr>
<tr>
<td>0.7</td>
<td>4.2</td>
<td>3.3</td>
<td>2.5</td>
</tr>
<tr>
<td>0.8</td>
<td>4.5</td>
<td>3.6</td>
<td>2.7</td>
</tr>
<tr>
<td>0.9</td>
<td>4.7</td>
<td>3.8</td>
<td>2.8</td>
</tr>
<tr>
<td>1.0</td>
<td>5.0</td>
<td>4.0</td>
<td>3.0</td>
</tr>
<tr>
<td>1.2</td>
<td>5.5</td>
<td>4.4</td>
<td>3.3</td>
</tr>
<tr>
<td>Formulas</td>
<td>$5\sqrt{T}$</td>
<td>$4\sqrt{T}$</td>
<td>$3\sqrt{T}$</td>
</tr>
</tbody>
</table>

**Table 5. Tensile Load (minimum).**

<table>
<thead>
<tr>
<th>Sheet thickness (mm), T</th>
<th>A category</th>
<th>B category</th>
<th>C category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>1.61</td>
<td>1.52</td>
<td>0.98</td>
</tr>
<tr>
<td>0.6</td>
<td>2.11</td>
<td>1.73</td>
<td>1.27</td>
</tr>
<tr>
<td>0.7</td>
<td>2.65</td>
<td>2.16</td>
<td>1.62</td>
</tr>
<tr>
<td>0.8</td>
<td>3.23</td>
<td>2.65</td>
<td>1.96</td>
</tr>
<tr>
<td>0.9</td>
<td>3.82</td>
<td>3.14</td>
<td>2.35</td>
</tr>
<tr>
<td>1.0</td>
<td>4.54</td>
<td>3.72</td>
<td>2.74</td>
</tr>
<tr>
<td>1.2</td>
<td>5.88</td>
<td>4.90</td>
<td>3.83</td>
</tr>
</tbody>
</table>

**Fig. 4** The macro appearance of three specimen after Spot Welding with 11kA

4 Conclusion

Based on the result and discussion, the following conclusion can be drawn:

a. The variation of current has affected the shear strength and nugget size. The highest shear strength 167.1 MPa and nugget size 7.3 mm was found as a result of current
12.5 kA; the lowest 121.2 MPa and 1.7 mm of shear strength and nugget size respectively was obtained as a result of 10.5 kA.
b. The optimal current for spot-welding SCGA270D-45 material with thickness 0.8 mm is 11 kA for components belong to A-category of [3].

References
Influence of Gadget: A Positive and Negative Impact of Smartphone Usage for Early Child

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Abstract. Technology is an important part of human life. Gadgets are a kind of technology that most widely used by humans. These include smartphones, tablets, iphone, blackberries, laptops and more others. Not only used for communication, gadgets also become a trend in today's cultures for life and knowledge. All information and daily activities such as shopping, payment and entertainment are provided by this device. Users of gadgets are very heterogeneous, from old people to young child. Many researchers believe that the use of gadgets can have an impact on the growth and development of early childhood. This paper presents the impact gadget usage in early childhood and it also describes parent's role to prevent children from the negative effects of gadget usage.

Keywords: Gadget usage, children, technology, parent role

1 Introduction

Nowadays, the use of technology is increasing day by day. Human life is dependent on technology. Technology is being implemented in almost every aspect of our lives and we use various technologies to accomplish specific tasks in our lives. One of the results of technology used by many people are smartphone and tablet. The smartphone facilitates many aspects of daily life and can be very useful and entertaining tool, not only to communicate, but also can be used to shopping activities, banking, search for places and people, game services and others. Therefore, humans today are very dependent on this object.

Research from Growth from Knowledge (GfK) Asia that Indonesia is the country with the biggest market for smartphone products in Southeast Asia in the first quarter of 2012, even smartphone penetration in Indonesia has reached 62% with sales of more than 1.4 billion. KOMINFO data also states that smartphone users in Indonesia are growing rapidly and the Emarketer Digital Marketing Research Institute estimates that by 2018, the number of active smartphone users in Indonesia is more than 100 million people [1]. From the data, it is known that the magnitude of smartphone usage is also accompanied by the penetration of internet networks and the fulfillment of online-based human needs.

The smartphone usage and needs are not only enjoyed by adults but also children. The needs and interests of smartphones in children are different from adults. In adults' smartphones are used as a communication, lifestyle, search engine, entertainment whereas for children smartphones or tablets are used for playing and entertainment needs (video games, entertainment applications, social media). The most important difference is they do not have
the ability to use smartphone wisely, so that it is believed that without parental supervision, the smartphone will be a malfunction and have a negative effect on children.

As we know smartphone like a knife, has two sides, on the one hand this device provides benefits and is needed and the other side also creates many potential hazards. If it cannot be handled wisely by parents, it will damage the next generation. The development of gadgets is unavoidable, but adults must be able to educate without having to seize children's rights to be able to access digital information so that the gadget becomes the effective device.

2 Methodology

2.1 Use of a Smartphone Gadget

Gadgets are electronic instruments that have certain practical purposes and functions especially helping and facilitating human work [2]. Gadgets are small applications that run on the Windows operating system [2]. Examples of gadget categories that are often found in Indonesia are smartphones, cellphones, blackberries, tablets and computers.

In Indonesia, gadgets have been used by many people even used by early childhood. The results of the study stated that 42.1% of preschoolers were exposed to relatively high gadgets. The use of gadgets in preschoolers is watching videos or playing games [3].

2.2 Development of Early Childhood

Early childhood is a child between the ages of 0-5 years [4], while National Association for the Education of Young Children (NAEYC) states that up to 8 years old children are still classified as early childhood. Early childhood is unique, expresses its behavior relatively spontaneously, egocentric, enthusiastic, explorative, has a high curiosity and is adventurous. Early childhood is often called the golden age because all potential can grow rapidly along with the development of brain volume up to 80% at this time. Children are excellent imitators rather than excellent voters, meaning that many children can imitate the words and behavior of parents, but have not been able to choose what words and actions are better and right for them to use.

Early childhood has a growing and developing period that must be considered. The developmental aspects of early childhood include; motor physical development, language development, cognitive development, emotional development, social development, religious and moral development and artistic development. Parents and other adults are the most important influence on a child’s development. Parent can model and teach the skills that will help them to successfully complete the developmental tasks of their age well.

3 Result and Discussion

3.1 Positive Impact Smartphone Usage for children

Based on the results of research conducted by The Asian Parent Insight in November 2014, as many as 98% of 2,714 parents in Southeast Asia allowed their children to access technology in the form of computers, smartphones and tablets. This research was conducted on parents who have children aged 3-8 years and come from Singapore, Malaysia, Indonesia, Philippines and Thailand. The results of the survey stated that the reason parents allowed their children to play gadgets for educational purposes. But the reality is that most smartphone and
tablet gadgets are used by children for entertainment / play [5]. Here are the benefits of smartphone gadgets for child development:

**a. Motor Physical Exercise**

The use of gadgets or smartphones can be used as an exercise in fine motor physical skills in early childhood. These fine motor skills are skills related to small muscles such as the wrist, fingers, toes, lips and tongue. When early childhood play on smartphones or tablets and other gadgets, they will learn to coordinate finger movements [6] and use their hands more quickly and become efficient in it in a short time.

**b. Increase of Knowledge**

When using a gadget in the form of a smartphone or tablet, children can increase their knowledge about many things. Children learn to know lots of pictures and writing and various colors.

**c. Improve of Cognitive Skills**

Children's cognitive skills are the child's ability to process information, ability to remember and simple reasoning and communicate. When children play games on applications that are available on smartphones or educational programs, at that time the child will give time for his brain to think and process information and forwarded to the brain for processing or analysis. This is also supported by several studies which mention that the gadget has a positive impact on the ability of investigation, strategic thinking and creativity thinking [7].

The activity of playing games on a smartphone or viewing interactive videos provided on smartphones is much more fun and interesting for children because it is presented in the form of audio-visual media.

**d. Train Mental Attitude Ready to Compete**

When a child plays a game, he will recognize winning and losing. This activity can introduce it to a struggle and effort. Children will be more enthusiastic and enthusiastic to get the results they want.

### 3.2 Negative Impact of Smartphone Usage for Children

**a. Obesity and Physical Damage**

Children who excessively use smartphone gadgets will cause obesity. This is supported by the results of research showing pre-school age children with high intensity of gadget use have a 2.1 times greater chance of being obese compared to preschoolers with low gadget usage [8]. The World Health Organization (WHO) also states that one of the factors that causes child obesity is increased sedentary behavior (behavior is not much movement or lack of physical activity). Taking a tablet or smartphone all the time, a child cannot control the normal food intake. Either they eat too quickly or too much since they are concentrated on the screen, not on the meal.

As we know, physical activity held regularly can be beneficial to strengthen the heart, blood vessels and body and brain systems that are fitter. Physical damage such as eye pain is also a threat to early childhood. The high level of eye activity on the smartphone screen will damage the function of the eye, the eyes become tired and uncomfortable. Dr. D.A.N Canara Sari, SP. M quoted by Eva Erviana also added that using a gadget for a long time and close range could cause eye minus [9].
b. Addiction

Early childhood who have the activity of staring at screen-based media and gadgets such as smartphones and tablets to play games longer and increase in duration every day are signs of addiction. This addiction occurs due to things or things that make children happy which will stimulate the brain to produce dopamine excessively. Excessive amounts of dopamine will disrupt the workings of the hypothalamus, the part of which is responsible for regulating emotions and moods that make us feel very happy and over-confident.

c. Less Concentrate

Children who play many video games in smartphone or most of their time online tend to have less an ability to focus thank kids who use gadget minimally.

d. Speech Delay

Speech delay is one of the causes of developmental disorder in child language. Speech delay is caused by excessive use of gadgets. When a child uses a gadget such as a smartphone, the child will focus on looking at the screen and not making social contact whereas contact and social communication are needed by children to develop their language skills and speech.

The study presented at the Pediatric Academic Societies Meeting in San Francisco explained that Birken, a pediatrician at the Hospital for Sick Children Canada found a connection to the use of gadgets in the ability to speak to children. In 2011-2015, Birken conducted observation and question and answer to parents who have children aged 2-24 months regarding the duration of time given to children to watch through the gadget screen, 20% of the children studied used a gadget for at least 28 minutes every day. The result they found every additional 30 minutes of time used to play gadgets can increase the risk of late speaking up to 49% [10]

The results of another study of 714 children aged 24-60 months in Tambakrejo, Surabaya also proved a significant relationship between children's speaking ability and gadget use in children [2].

Social disability. The research results show that most children have the habit of playing gadgets more than 1 hour each day experiencing degradation of social development [11]. Children with high gadget activity will become apathetic to the environment, the level of aggression will also increase.

Added, in an article by Dr. Gary Small, director of the longevity center at the University of California says that if children spend much time on technology and less time with people, it hinders interaction and disrupts the normal communication skills development on children.

e. Radiation Exposure

According to the 2014 report of the World Health Organization (WHO), cellphone and other wireless devices are considered catagory risk because of their radiation emission [15]. In December 2013, Dr Anthony Miller from The University of Toronto’s School of Public Health revealed that radio frequency exposure is clearly a threat to children.

f. Attention Deficit Hyperactivity Disorder Problem

Phones and tablets becoming a part of daily life. According medical expert, the overuse of gadgets in children can contribute to ADHD-like symptoms. According to Centers for Disease Control, Children who have ADHD have trouble playing attention and be overly active.

The lastest study, published in the Journal of the American Medical Association has linked ADHD to teens who frequently use electronic device. Out of 2586 student who
consumed multiple types of digital media were about twice as likely to report strong ADHD as their peers [12].

g. The Role of Parent in Monitoring Smartphone Usage

Nowadays the use of gadgets cannot be avoided, therefore parents and adults around the child have an important role. At the age of 0-2 years, gadgets actually haven’t an important function and a positive impact on them. However, if conditions are not possible and the child exposed to electronic screen media, parents must be able to aid so that there is no misuse of the gadget and have a negative impact on the child.

Here are some tips to help head off these problems. Make sure parents have enough time to assist children using gadgets (smartphones) in a relatively short time. The ideal time for children to use gadgets at an early age is 5-30 minutes with an intensity of 1-2 times per day [3].

Parents must take control of the gadget (smartphone) including the mastery of the existing application and the content provided on the smartphone. Lots of inappropriate content for children so that parents’ wisdom is needed.

Don’t let the child use the gadget in a private room lonely, such as the first point that the use is still being assisted by parents. Make sure the position of the child playing or using the gadget is correct with the right duration and visibility. Don’t let them use gadgets smartphone in the dark or in sunlight and while using smartphone or other personal device, the eye should be at least 20 inches away from the screen. Don’t let the children too close to the screen. Encourage children to play outdoors. Facilitating outdoor play activities for children, playing outside can divert children from smartphones or other gadgets and playing outdoors with pet or other kids is more fun than watching video or gaming.

4 Conclusion

This isn’t to say that gadgets smartphone is bad, or that children should never use gadget. Being a parent and child in the era of globalization is full of challenges. The important thing to understand is the higher the need to use a gadget must be accompanied by the ability to master the gadget itself. Gadgets provide a positive opportunity but it has a negative impact on children and their future lives too. Parents must have to supervise, monitor and control children using gadgets responsibly and wisely.

References


Development of Teaching Materials Based On Digital Module in Pattern Construction Course for Fashion Education Students in State University of Medan (UNIMED)

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Abstract. This research aims to: 1) to developer teaching materials based on digital module in pattern construction course, and 2) to find out the effectiveness of teaching material based on digital module in pattern construction course in fashion education section. The type of the research used in this study is Research and Development (R&D). It uses the stages or procedures that have been adapted, which include: a) needs analysis; b) developing products; c) Validation and revision; d) Small group trials of 5 students; e) Medium group trials of 15 students, and f) large group trials; g) The final product. The subjects in this research trial are 30 fashion education students class of 2017. The expert validation consists of 2 media experts and 2 material experts, and learning design experts. Data collection tools are using in this research is questionnaires to trace the needs of lecturers and students. Validators and questionnaires for effectiveness include a rating scale with data analysis techniques using a Likert scale. Digital module developed with the Edmodo application network. The result of the research from media expert get a percentage of 87.33% with very good criteria and validation of the subject matter expert with a percentage of assessment results of 90.67% with very good criteria. 2) The results of a small group trial with a percentage of 76%, with good criteria being medium with a medium group trial with a 78% percentage assessment with criteria and a large group trial with a percentage of 90%, with very good criteria. 3) Testing the effectiveness of students with a percentage of 90% with very good criteria. Trial of effectiveness by lecturers with assessment percentage 92% get very good criteria. So, the development of teaching materials based on digital module in the construction course of Fashion Education Students in 2017 is considered effective and feasible to be used as learning media.

Keywords: Teaching materials, digital modules, pattern construction, effectiveness

1 Introduction

The success of learning can be seen from two interrelated aspects such as the process aspects and product aspects. The process aspect is determined by the role of the lecturer as the manager of teaching, namely as a planner or designer. Fathurrohman (2015) argues that the lecturers act as facilitators, managing various learning resources and facilities for students. So the success of the aspects of the process created and applied in learning will certainly affect the aspects of the product produced. The product aspects produced will be seen from the
learning outcomes obtained by students. However, the success of students in processing new information given by lecturers is very dependent on the maturity of the students’ thinking power. Therefore, the learning must be well designed and programmed, so we will get the active interaction between lecturers and students.

The pattern construction course is a compulsory and important subject consisting of those who experience various problems in learning. This course is a basic course that provides students with basic knowledge and skills about the basic concepts of pattern construction, construction patterns and standard patterns. Pattern construction is used as a guide in making clothing until eventually it is expected that students will be able to change the pattern and create clothes that are comfortable to wear and fit on the body. Based on the information, the observations and the observation result from the Pattern Construction learning process, it was found that the lecturer had applied several learning methods such as lectures, question and answer, discussion, practicum and assignment. Furthermore, based on the documentation of the scores (DPNA) of the students in Family Welfare Education department (Pkk) in 2017, it was found that there were still many students who received learning outcomes that did not meet the minimum passing grade of 36 students who received an A score of 3 (8.33%), a B score of 8 (22.22%), C is 12 people (33.33%) and as many as 13 people (36.11%) do not meet the minimum passing grade.

The low student learning outcomes are certainly influenced by various factors, among others, the learning methods that are applied are not in accordance with the lecture material, the lecture material obtained by students only comes from textbooks whose existence is not necessarily in accordance with the needs of students, even tends to existing textbooks not in accordance with the curriculum and competence of students. Based on the description above, an alternative effort is needed that needs to be developed by the lecturer in Pattern Construction. One of them is by developing learning materials through the development of teaching materials.

This of course refers to PP No. 19 of 2005 Article 20 that is suggested that lecturers are expected to develop their own learning material. Then confirmed through the Minister of National Education Regulation (Permendiknas) number 41 of 2007 concerning process standards, among others regulating the planning of the learning process which requires educators in education units to develop learning implementation plans (RPP), one of which is a learning resource as an important element in an RPP. Thus, it is expected that lecturers can develop learning materials as part of learning resources.

According to [1] that teaching material is a set of facts, concepts, principles, procedures, and or generalizations that are specifically designed to facilitate teaching. Teaching materials serve as guidelines for lecturers and students about the substance of competence that should be taught to students and must be mastered / studied by students. Teaching materials can be in the form of textbooks, modules, films, compact disks (CDs), multimedia interactive learning and web-based modules (web based learning materials) or digital modules.

The development of information technology, especially internet technology can be used as an alternative to making effective and efficient learning modules. The use of E-Learning in learning has the advantage of saving learning time, reducing travel costs, saving costs, reaching a wider area and training more independent students in gaining knowledge.

Based on the description above, it can be assumed that the need to develop teaching materials in the form of digital modules that can be accessed and obtained by students anywhere and anytime, so that students are easy to learn and understand learning materials that are expected to improve student learning outcomes.
1.1 Formulation of the problem

The formulation of the problem in this study is:
(a) How to develop Digital Module teaching materials in the Pattern Construction course of the Fashion Education Study Program?
(b) How to test Digital Module teaching materials in the subject of Pattern Construction in the Fashion Education Study Program?
(c) How is the effectiveness of the pattern construction course for the students in Fashion Education Study Program by using Digital Module?

1.2 The Objective of the Study

In general, the purpose of this research is to solve the problems mentioned above, then research the development of Pattern Construction Digital Module teaching materials. The purpose of this research specifically is to find out:
(a) Development of Digital Module teaching materials in the Pattern Construction course in Fashion Education Study Program.
(b) The results of the trial of the Digital Module teaching materials in the Pattern Construction course in the Fashion Education Study Program. Effectiveness of the pattern construction courses of students in the Fashion Education Study Program by using Digital Module.

2 Methodology

2.1 Development of Learning Materials Based on Digital Modules

Teaching materials are a set of materials that are arranged systematically to create an environment / atmosphere that allows students to learn. According to [2] states that teaching materials are all forms of materials, information, tools and texts that are used to assist lecturers in carrying out teaching and learning activities. The instructional material in question can be in the form of writing or not written. Teaching materials or curriculum materials are content or curriculum content that must be understood in an effort to achieve the curriculum objectives. One form of teaching material is a module.

2.2 Characteristics of Learning with Modules

In order to produce a module that can increase the user's motivation, the module must include characteristics:
1) Self instructional.
   Self instructional is an important characteristic in the module. With these characters allows one to learn independently and not depend on others. To fulfill this character, the module must.
2) Self contained.
   Self contained is the whole learning material from a competency unit or sub competencies that are studied contained in one module in its entirety. If in a module the division or separation of material from one competency unit must be done carefully and pay attention to the freedom of competence that must be mastered by students.
3) **Stand Alone**  
Multimedia modules that are developed are not dependent on other media to study and work on module tasks.

4) **Adaptive**  
The module should have high adaptive power to the development of science and technology. Modules can adapt science and technology.

5) **Userfriendly**  
The module should be friendly to the user, including instructions and information exposure that are helpful, easy to understand, and use general terms.

2.3 The Role of the Modules in Learning Activities

The modules are very important for lecturers and students in the learning process. Without the modules, it will be difficult for lecturers to improve the effectiveness of learning. Likewise with students, without modules it will be difficult to adjust to learning. Therefore the module is considered as an additional teaching material that can be used, both by lecturers and students as an effort to improve the quality of learning. The role of modules for Lecturers and Students:

1. Save lecturer time in teaching
2. Students can learn by themselves without having to exist lecturer or other friend
3. Changing the role of the lecturer from a teacher to a facilitator Students can learn anytime and anywhere they want
4. Improving the learning process to be more effective and interactive Students can learn according to their own pace
5. Students can study according to the order they choose
6. Helping students to be more independent [3]

With the learning module it is assumed that students will be motivated to read and study independently without being dependent on the lecturer. Finally students find the desired capability or study. The more concrete students learn teaching materials, the more experience they get. In determining the scope or scope of learning material needs to pay attention to several aspects, namely: (1) cognitive aspects which include knowledge, understanding, application, synthesis, analysis and assessment; (2) Affective aspects which include giving responses, appreciation, assessment and internalization and (3) Psychomotor aspects which include initial movement. In the preparation of the module can be done according to the following format:

(a) Cover page  
The page can also add the author's name, meeting to what number, subject name, and other important information
(b) Subjects Adjusted to Standard Competence
(c) Description Contains a brief description of content and description of the material contained in the module
(d) Prerequisites Basic abilities should be owned by students
(e) Glossary terminology
(f) Instructions for using the Contains module instructions and procedures for using the module
(g) Basic Vocational Competency
(h) Basic competencies are usually designed to be some learning activities depend on breadth and depth of material
The purpose of Module Learning consists of several learning objectives are appropriate with those listed in the syllabus and RPP Learning objectives are written briefly but describe the entire contents of the material learning.

Description of the description is presented in the form sequentially so that the writer is in front the reader. Include complete examples and clear.

Formative Test Aims to measure student learning progress in one unit learning. Provision of objective tests make it easy for students to do measurement (giving value) above his own ability.

Bibliography Lists bibliography and used as a source in the preparation of modules.

2.4 The Nature of Pattern Construction Courses

The Pattern Construction course is a compulsory and basic subject at the Department of PKK in Faculty Engineering, State University of Medan. The purpose of the Pattern Construction course is for students to understand the basic concepts of pattern construction, both the system of construction patterns and standard patterns. In this case students are expected to have knowledge and skills in making basic patterns of body, arms and skirts and breaking patterns according to the model. In order to achieve the learning objectives, students must master several patterns of pattern construction, namely the basic pattern with a coup on the waist and sides, the basic pattern with a coup on the waist and fittings.

The competency standard in the Construction Pattern course is to understand and be skilled in constructing patterns, both in the construction of children's, women's and men's fashion patterns in construction. Material description in Pattern Construction courses are formulas that need to be understood in taking measurements and drawing various patterns. Therefore, the learning will be better if supported by the learning media, so that it can help students to more easily understand the material that has been explained by the lecturer.

The study was conducted in the Class-A Fashion Education Program -Department of Family Welfare Education (PKK) - Faculty of Engineering - State University of Medan (UNIMED). When the research was conducted, the odd semester of the 2018/2019 school year took place from July to October 2018.

The development model is the basis for developing products that will be produced. According to Sugiono (2015) the steps of research and development are: 1) determine potential and problems, 2) data collection, 3) product design, 4) product design validation, 5) product design revision, 6) product trials, 7) usage test, 8) Revision of Data Collection Technique products

Data collection methods are the main step of research, with the intention of getting accurate and accountable data. Data collection techniques in this study were carried out in several ways, namely: 1) Observation 2) Interview 3).

3 Results And Discussion

3.1 The Instrument for Collecting the Data

The techniques for collecting the data are the method taken to obtain data in accordance with the data needed. The instrument used in this study is by using Questionnaire. The questionnaire aims to determine aspects to develop teaching materials based on digital modules in the opinion of lecturers, especially pattern construction courses. Furthermore, the
data obtained is used as a reference for the development of teaching materials through the Edmodo application digital module.

3.2 Analysis of the Data

Analysis of the data used in the development research is descriptive statistics that describes the steps in developing digital module-based interactive learning media in the Pattern Construction course and illustrates the results of the effectiveness of learning media. To test the effectiveness of learning media in the Pattern Construction engineering course, several stages were carried out, namely the validity test by media and material experts, group trials and lecturer responses.

The results of the feasibility test of the learning media from the views of 2 media experts if presented in the bar diagram are as follows:

Feasibility test of learning media by media experts with a percentage of 92% based on the feasibility aspects of media content. Based on the presentation aspect of learning media with a percentage of 85%. Based on the feasibility aspect of the percentage by media experts with a percentage of 85% research media learning with a percentage of 87.33% so that it falls into the criteria of very good / very feasible / very good to use as a learning medium. The results of the feasibility test of the learning course from the viewpoint of 2 expert material if presented in the bar diagram as follows:

![Average Percentage Diagram by Media Expert](image1)

**Fig. 1. Average Percentage Diagram by Media Expert**

![Average Percentage Diagram by Material Expert](image2)

**Fig. 2. Average percentage diagram by the material expert**
Feasibility test of learning courses by material experts with a percentage of 94% based on aspects of the feasibility of the contents of the course. Based on aspects of the learning media strategy with a percentage of 92%. Based on the feasibility aspect of the learning media language with a percentage of 86%. Based on all aspects of the study of learning material with a percentage of 90.67% so that it is included in the criteria of very good / very decent / very good to use as a learning medium.

Based on the results of the assessment of the effectiveness of digital module-based teaching materials by lecturers and students of the Fashion Education Program - Department of PKK – UNIMED

![Percentage of Differences by Lecturers and College student](image)

**Fig. 3. Percentage of Differences by Lecturers and College student**

The test results of the effectiveness of instructional media by students get a percentage of 90% so that it belongs to the category of very feasible and while the results of the effectiveness test of instructional media by the lecturer gets 92% so the learning media is very feasible to use.

### 3.3 Research Discussion

This development research was carried out in several stages which Sugiono put forward, which was simplified into seven stages, which included the analysis of student needs, the stage of product development, subject validation of the subject matter and revision, the small group trial stage, the large group trial stage and the test stage. try a large group.

In the results of the validation sheet which was assessed by media experts 87.33% that the media was worthy of use because of the good appearance of the image, the animation was good. Student attention increases so as to create interesting and efficient learning. Then the material expert gave an assessment of 90.76% that the module was suitable for use in the teaching and learning process because the language used was easily understood and in accordance with the RPP and lecture contracts.

In the results of the questionnaire responses of students and lecturers that have been conducted, the learning media of Pattern Construction courses received a 90% response in criteria "very good results of the effectiveness of the instructional media test by the lecturer got 92% so that the learning media is worthy of use.
4 Conclusion

Based on the development research conducted and the discussion that has been described can be concluded in this study as follows:

a. The results of the development of digital module-based teaching materials at the Fashion Education Program – Faculty of Engineering were assessed by an overall media expert 87.33% with a "very good" criteria and an assessment of the subject matter expert at 90.67% with a "very good" criteria so that the media Digital module-based teaching materials are suitable for use as learning media in pattern construction courses.

b. The trial results of the development of digital module-based teaching materials concluded that the learning module media that was developed were included in the excellent category with the overall value of media experts 90.67% of the results of small group trials 76% medium group test results 79% and test a large group of 90% has been eligible for production as a learning medium.

c. The product of teaching materials based on digital modules is concluded that effective learning media are used as learning media for pattern construction courses in the Fashion education program - Faculty of Engineering -UNIMED. Based on the results of students responses to the effectiveness test, the criteria were obtained with very good criteria with an average percentage of 90% and the teacher's response was considered very good with an average percentage of 92%.

Suggestion

Based on the discussion of the results of the study, the authors show some suggestions for improving and further research as follows:

1. It is expected that lecturers should have the willingness to make learning media so that learning and teaching processes are more interesting and interactive and can increase students' motivation in learning in pattern construction subjects.

2. We recommend that the teaching and learning process such as lectures that have been carried out in the learning process is assisted by learning to use digital modules based teaching materials that can have a positive influence on students' interests, motivation and learning outcomes.

3. For lecturers who will conduct research on the development of learning tools for eye construction patterns in order to produce better learning and multimedia media

References

Participatory Learning Through Instructional Games for Functional Literacy Students of SKB Binjai

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Abstract. The purpose of this study is to develop participatory learning through instructional games for functional literacy students of Sanggar Kegiatan Belajar (SKB) Binjai. In general, the students of functional literacy program are adults who have not had time to complete their education in formal education, so this research is carried out to help these adults learn, given that adults will only learn something that appropriate with their needs. Based on the preliminary research, it is found that the learning process recently uses a conventional approach where the curriculum, questions, discussions, and assessments are designed by the tutor according to the needs of the learners. Through this participatory learning, students are given the freedom to determine learning programs, design, and develop learning patterns as well as release their stress from daily routine through instructional games. Learning through instructional games is defined as the application of technology in the world of learning for an educational process. The media is a tool that can be used as a channel to achieve teaching objectives. If the media is designed properly and appropriately, it can be a fun learning with high interactivity element, and it can stimulate students to remember more about the material of learning. The most common obstacles encountered in nonformal learning are the lack of collaboration among the students’ during the learning process and moreover tutor rarely gives a reflection on each meeting so that the shortcomings experienced by each student on each meeting cannot be determined and improved at the next meeting. Therefore, learning instructional games which consists of collaboration steps with tutor to plan, observe, and do reflection about the lessons. Based on the data analysis, the implementation of instructional games can increase learning activity. Increased learning activities will lead to the improvement of the quality of learning process and learning products. The application of these two aspects are proven can help students to identify the urgency of the problems occurred in the classroom, and seek for a solution in order to achieve more meaningful learning process. This result is corresponding with the concept of learning which is a process undertaken by a person to obtain changes in overall behavior that derived from the results of his/her own experience in interaction with the environment.

Keywords: Participatory Learning, Instructional Games, Functional Literacy Students.

1 Introduction

1.1 Background
The general purpose of national education is to create advanced, independent, and prosperous people and people of Indonesia both physically and spiritually. Human and
developed society can be reflected in the increasingly high level of education, knowledge, skills, mental attitude, health, income, and future-oriented cultural values.

Along with the educational curriculum that continues to evolve, the learning process is not only focused on theory. Learning citizens need to be directed to be able to absorb the experience of the learning process that is designed interesting and fun. Therefore, learning in the classroom must be able to change the mindset and reduce learning citizens to learn, argue, take initiative, or interact.

In general, the process of learning functional literacy that takes place only focuses on the competencies that the tutor wants to develop. Thus, the results achieved can not represent the knowledge and skills desired by the learning community. Through innovative and fun learning activities, the classroom atmosphere will not become rigid and monotonous. The learning citizens were invited to discuss, interact, and dialogue so that they were able to construct the concepts and meanings of the knowledge they learned. Learning citizens must also be accustomed to differing opinions and arguing that they become intelligent and critical.

Information Technology development in recent years has developed quite rapidly, so that this development has changed the paradigm of the community in seeking and obtaining information to be no longer limited to newspaper information, electronic audio visuals, but also other information sources such as through the internet.

One area that has had a significant impact on the development of technology and information is the field of education. Basically, education is a process of communication and information from educators to students that contains educational information that has elements: (1) Educators as one source of information; (2) Media as a means of presenting ideas; (3) Ideas and educational material as well; (4) Students themselves. The development of technology and information development and its application in education is a growing discourse at this time. Integration of information technology into education one of them is in the form of instructional games.

Today's tutors must start using the internet as a learning resource. With learning like this, it is hoped that the knowledge of tutors and learning citizens will develop. In addition, tutors and learning residents will also be accustomed to operating computer equipment.

Functional literacy education is a non-formal education program with an emphasis on the mastery of knowledge, functional skills, as well as the development of the attitude and professional personality of learning citizens. Recognition of the existence and function of functional literacy education in the community, raises a big problem for the government and society so that in its implementation this program can provide a guarantee of quality education that is really good. However, the challenges faced by the implementation of education do not stop at the agreed policies, but the application of learning models that are appropriate to the needs of the learning community. Therefore, a research is needed to answer the learning model.

1.2 Research Purpose

The purpose of this study was to develop a participatory learning model based on instructional games for the functional literacy learning group of Binjai City SKB. The research implementation activities are divided into three main stages which consist of:

1. Phase of preliminary studies, empirical studies and policy studies
2. Stages of model development
3. Pre-test and post-test evaluation phase.
2 Methodology

2.1 Concept of Playing
According to [1], "various games (games) can be made intentionally (intentionally) with the intention that children improve certain abilities based on learning experience. Through playing activities, various jobs are realized. Playing is an activity chosen by the child because it is fun, not because it will get a prize or praise". "Computers become popular as a teaching medium because computers have feature that other teaching media do not have before the existence of a computer" [2]. The forms of using computer-based interactive multimedia models in learning can be in the form of drill, tutorial, simulation, and games [3]. Basically, one of the objectives of learning with interactive multimedia is to replace and / or complement and support the elements as much as possible, the objectives, materials, methods and tools of research that exist in the teaching and learning process in the conventional education system that we normally do.

2.2 Instructional Games
Instructional games are designed with challenging and fun game patterns. The whole game in principle has a basic component that is used as a reference to generate motivation by creating creative ideas to arrive at the end of the game. According to [4], instructional games are divided into three components, as follows:

2.3 Introduction (Introduction)
The aim is to set the stage of the game and ensure students will understand what to do. If the opening is less interesting, it will lose the learning objectives, because students may only concentrate on solving nonessential problems from the instructional games themselves. In the opening there is usually a title or title, goals, rules / rules, instructions for playing / direction for use, and game choices.

2.4 Form of Instructional Games (body of instructional games)
This section includes: scenarios, game levels, game players, rules of the game, challenges in achieving goals, curiosity, positive competition, meaningful relationships between players and learning, ability to fight opportunities, win or lose, game choices, paths or steps to be taken, changes, types of activities, interactions in play.

2.5 Closing
In closing the game that must be considered is: telling who the winner is by giving the best score, giving rewards in the form of objects such as money, food, or additional games for free, providing information especially with feedback for players in improving the game in individual appearance, and last closing.

In developing instructional games, one of the first steps needed is making a flowchart. According to [5], "the flowchart is to design the flow model of thinking about the contents of the program". In each workflow design or information processing should be based on the communicative flowchart visualization. The aim is that the flow and path of the work process can be easily understood and passed and the user is followed thoroughly and meaningfully. Furthermore, [5] added that "flowcharts are important, flowcharts must be able to show the flow or course of learning". The following is a flowchart of instructional games.
From the observations carried out by researchers starting in January 2017, information was obtained that *SMK Negeri 1 Panyabungan* is a Business Management Vocational School. Initially this school took care of only the business and management fields of accounting expertise, office administration and marketing competence. Along with the progress of the times and the needs of the world of work in 2006, the Computer and Network Engineering (*TKJ*) expertise program was opened in the field of Information Technology and then developed again starting in 2016, the Multi Media and Banking expertise program was opened again. This school is one of the vocational schools that have implemented Production Unit (*UP*). Management of UP in *SMK Negeri 1 Panyabungan* is carried out to enhance the potential of each study program in the form of services and goods consisting of the business fields of Stores, Mini Banks, Student Canteens, Typing Services, Photo Copy, Computer Screen Printing, Animation Design, Photographers, Computer, Warnet and Internet Network installation services.

Activities carried out at the UP marketing branch are management of student canteens and shops selling office equipment, electronic goods, basic needs of students, basic needs of the community and promotion of student services to the general public and other expertise programs. Branch UP accounting and banking activities have a mini bank services unit. Financial services managed are credit and debit services to customers for senior high school (*SMA / SMK / MA*) students in *Mandailing Natal* District. Where the mini bank works with 3 Commercial Banks, namely: North Sumatra Bank, Bank Rakyat Indonesia, and Bank Mandiri in the *Panyabungan* Branch. Activities at the Branch UP Office Administration are engaged in services in the type and photo copy in 3 (three) unit locations in *Panyabungan*. The location is placed in a strategic area, so that the services offered are very much visited by customers, both students, employees up to the general public. Branch UP *TKJ* and multimedia activities are computer service services, animation designers, computer screen printing and internet networks have 3 (three) units as well.

Many experts say about the understanding of the model according to the Indonesian Dictionary, model is defined as a pattern (example, reference, variety) of something that will
be created or produced [2]. Meanwhile, according to Martubi "The model is the abstraction of reality by focusing on several characteristics of real life [2]. Based on the opinions above it can be concluded that the model is a form of pattern that is emulated, either in physical form of a work or a picture (abstraction) of reality. Hasibuan said that: "Management is the science and art of managing the process of utilizing human resources and other resources effectively and efficiently to achieve a specific goal [3]. While Griffin suggested that management is the process of working together between individuals and groups and other resources in achieving organizational goals as activities of management [4]. From several definitions or understanding of management above, it can be summed up that management is: (a) the existence of cooperation between elements within an organization; (b) the existence of an effort to utilize the elements of the organization; (c) the existence of clear objectives to be achieved by the organization; (d) arrangements to achieve organizational goals.

According to Mulyasa the competence of expertise is a combination of knowledge, skills and attitudes that reflect in the habit of thinking and acting [5]. Further According to Boyatzis argues that the competence of expertise is the capacity that exists in someone who can make the person able to fulfill what is indicated by work in an organization capable of achieving the expected results [6]. From the definition of the statement above it can be concluded that the competence of expertise is defined as a set of mastery of skills, values and attitudes that must be possessed and mastered by students according to standards set by the government sourced from education, training and experience so that they can work professionally. From the description of the competency management model development above, a conclusion can be drawn that the purpose of the competency-based management model development expertise in this study is an effort to utilize existing resources through planning, organizing, mobilizing and controlling to achieve the knowledge, skills and attitudes possessed students according to the graduates' competency standards (SKL SMK).

Vocational secondary education is the only one from the education system in schools that is specifically prepared to produce mid-level skilled labor to fill the needs of business, industry and development. In order to achieve the objectives of the defined production unit, schools in running this business unit must always carry out good management. Therefore, in implementing the production unit program, the school makes a management model, which is a business that produces goods or services, optimally utilizing all forms of capital in schools and management which are supported by a chain or business network that requires each other or mutually beneficial. In addition, businesses in the form of production units need to be supported by the management system such as: marketing, promotion, research and development, quality control, and others. Based on the link and match concept that has been mentioned that one of the realization is the production unit management policy at the school. The production unit can be said to be a miniature of a company that has a lot to do with everything related to the company, namely: business status, goals, objectives, scope and management in the business. Furthermore, business fields can be classified into production and services. The service sector is a business that can be directly enjoyed by consumers, while businesses in the field of production generally cannot be directly enjoyed by consumers.

This type is a type of experimental research that aims to find out the usefulness of instructional games used in the learning community. In this experimental study will be seen the effect of certain treatments on one group on another group under controlled conditions. This study involved two classes that were chosen randomly, namely the experimental class and the control class which were given different treatments. With the experimental class and control class, the results obtained from the treatment in the experimental class can be known because it is compared to the control class that is not treated. In the experimental class, the
learning was given treatment with instructional games while the control class was not given treatment.

The type of experimental research used in this study is True Experimental Design, with the form of Posttest-Only Control Group Design, where in this design there are 2 groups selected randomly (R). The first group was treated (X) and the other group did not, the group treated was called the experimental group and the group not treated was called the control group. The effect of treatment (treatment) is (O1: O2).

3 Result and Discussion

3.1 Data Collection

After the data collection is complete, the next step is to present the value data from observations or research. From the research conducted, the data obtained from the experimental class and the control class were obtained. The average of the initial and final observation indicators of the Control Class and Experimental classes are:

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Control Class</th>
<th>Experiment Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>1</td>
<td>Descriptor 1</td>
<td>13,37</td>
<td>14,68</td>
</tr>
<tr>
<td>2</td>
<td>Descriptor 2</td>
<td>12,25</td>
<td>13,5</td>
</tr>
<tr>
<td>3</td>
<td>Descriptor 3</td>
<td>12,68</td>
<td>13,43</td>
</tr>
<tr>
<td>4</td>
<td>Descriptor 4</td>
<td>13,43</td>
<td>14,18</td>
</tr>
<tr>
<td>5</td>
<td>Descriptor 5</td>
<td>12,37</td>
<td>12,81</td>
</tr>
</tbody>
</table>

3.2 Preliminary Observations of Experiments Class and Control Class

Initial observation or pretest is done in the first week, which is without being given treatment to determine the ability of each class both experimental and control classes. In summary, the results of the initial observations of the two groups are shown in the table.

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistics</th>
<th>Experiments Class</th>
<th>Control Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of students (n)</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>Total Grade (∑Xi)</td>
<td>42,24</td>
<td>41,2</td>
</tr>
<tr>
<td>3</td>
<td>Mean (X̄)</td>
<td>2,64</td>
<td>2,57</td>
</tr>
<tr>
<td>4</td>
<td>Standard Deviation (SD)</td>
<td>0,146</td>
<td>0,141</td>
</tr>
<tr>
<td>5</td>
<td>Variance (S²)</td>
<td>0,021</td>
<td>0,020</td>
</tr>
</tbody>
</table>

3.3 Final Observations of Experimental Classes and Control Classes

After the initial ability was discovered through initial observation, a group was formed for the experimental class and the control group. For the experimental class, class B applied learning with media instructional games, while in the control class A used conventional learning or without media. At the end of the meeting, the learning residents were given a final observation (post-tet), to find out the development of the ability to master the material of the two class learning citizens after learning with instructional games in the experimental class and conventional learning in the control class. Feel the result of posttest, it can be seen that the
ability of learning people in the experimental class has increased while in the control class does not experience an increase or tend to be static, where the average value of the learning population in the experimental class is 4.19 and the average value of the control class is 2.745. In summary, the results of the initial observations of the two groups are shown in the following table.

### Table 3. Final Observation Data for the Experiment Class and Control Class

<table>
<thead>
<tr>
<th>No</th>
<th>Statistics</th>
<th>Experiment Class</th>
<th>Control Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of students (n)</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>1</td>
<td>Total Grade (∑Xi)</td>
<td>67.04</td>
<td>43.92</td>
</tr>
<tr>
<td>2</td>
<td>Mean ((\bar{X}))</td>
<td>4.19</td>
<td>2.745</td>
</tr>
<tr>
<td>3</td>
<td>Standard Deviation (SD)</td>
<td>0.248</td>
<td>0.189</td>
</tr>
<tr>
<td>4</td>
<td>Variance (S²)</td>
<td>0.053</td>
<td>0.03</td>
</tr>
</tbody>
</table>

From the results of the calculation of the initial and final observations above, it can be seen the difference between the average of the initial and final observations of the experimental class and the control class. In summary, the average value of the citizens of the two classes learning from initial to final observation can be seen in the following table.

### Table 4. Summary of Average Initial and End Observation Values for Experiment and Control Class

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Experiment Class</th>
<th>Control Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Total Grade (∑Xi)</td>
<td>42.24</td>
<td>67.04</td>
</tr>
<tr>
<td>Mean ((\bar{X}))</td>
<td>2.64</td>
<td>4.19</td>
</tr>
</tbody>
</table>

Descriptively, mastering the material on the initial and final observations in the experimental class and control class can be explained as follows:

- a. The average initial observation of the experimental class (2.64) is higher than the average initial observation of the control class (2.57). Experiment Class > Control Class = 2.64 > 2.57.
- b. The average final observation of the experimental class (4.19) is higher than the control class average (2.745). Experiment Class > Control Class = 4.19 > 2.745.
- c. The average difference between the initial observation between the experimental class and the control class is 0.07 and the difference between the final average between the experimental class and the control class is 1.445.

### 3.5 Hypothesis Testing

#### Table 5. Summary of Calculation of Hypothesis Testing

<table>
<thead>
<tr>
<th>No</th>
<th>Data</th>
<th>Mean</th>
<th>(t_{\text{count}})</th>
<th>(t_{\text{table}})</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Experiment Class</td>
<td>4.19</td>
<td>20.64</td>
<td>1.708</td>
<td>Significant</td>
</tr>
<tr>
<td>2</td>
<td>Control Class</td>
<td>2.745</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the table, it can be seen that the average mastery ability of the material using instructional games using media is higher than the average class with conventional learning. Based on the results of these calculations, it is obtained the results of the t test of 20.64, the
value of thutung is greater than the value of t table (20.64 > 1.462). Thus, learning using instructional games influences the mastery of the material.

Based on the results of data analysis, it can be concluded that instructional games affect the mastery of learning material. This can be seen from the data obtained before and after buying the instructional games in the experimental class and the control class without instructional games. Before giving different treatments to the two sample classes, the researcher first made an initial observation to see the initial ability in both sample classes.

In the initial observations in the experimental class and control class, the ability of citizens to learn is not good. This is because in the media training given or used by tutors, the variety varies. After the treatment is given to the experimental class, the researcher conducts a re-assessment (post-test) using the same instrument as the initial assessment instrument (pre-test). The same is true for the control class, which is to reassess it using the same instrument as the assessment instrument in the experimental class without treatment.

At the time of the initial observation, achieving the score of the learning ability of the students in the experimental class was 2.64 and in the class of 2.57, the initial ability score in the experimental class and control class was almost the same. Then tested the differences in initial linguistic intelligence scores and obtained $F_{count} < F_{table}$ or $1.05 < 2.43$ then concluded that both samples had homogeneous variance.

After different treatments were carried out namely the experimental class using instructional games and in the control class without instructional games, the scores in the experimental class were 2.64 and in the control class 2.57. From the results of the final observations of the two samples, a difference of 0.07 was obtained. From the data obtained there are significant differences between the mastery of the material in the experimental class and the control class. In the experimental class the mastery of matter has increased in terms of reading, writing and counting. While the control class does not experience an increase or tends to be static. This is because the learning by using instructional games media feels interesting and fun, so that the residents learn to enjoy learning, and the mastery of the material also increases.

Based on the explanation above, one of the media that can be used and influences the ability of learning citizens is through instructional games. Through instructional games that are adapted to the theme of learning and in accordance with the needs and development of learning citizens, a concept will be easier to instill through direct activities with the media. Tutors or educators need to have special skills and abilities both in planning, implementing, and evaluating ongoing learning activities by paying attention to the development of each learning citizen.

4 Conclusion

Based on the discussion of the results of the research that has been carried out, it can be concluded that the instructional games media can affect the learning abilities of learning citizens. Ability improvement can be seen in the final observation, where the average value of the experimental class linguistic intelligence using instructional games is higher than the control class without the use of instructional games or conventional learning. Tutors have also played an active role in using instructional games not only to direct, but have mastered the application.
Learning by using instructional games provides a good influence on learning citizens rather than conventional learning. This is in accordance with the hypothesis test obtained by $t \text{ count}>t \text{ table}$, which is $20.64>1.462$. So that it can be said that $H_0$ is rejected and $H_a$ is accepted, then the use of instructional games media influences the ability to read, write, and count learning citizens.

**Suggestion**

Based on the discussion and conclusions stated above, the researchers suggest the following:

1. For tutors and prospective teachers, they are expected to be able and skilled in designing active and innovative learning that can be done to improve the ability of learning citizens.
2. Program institutions can provide tutors the opportunity to attend seminars related to improving the learning process in an effort to improve the learning process.
3. For the next researcher, it can be an input in conducting further research on the application of instructional games in learning.
4. For readers can add knowledge.

**References**

Testing Instrument: Model Building Self-Resilience to Drug Initiation and Habit

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{* ros_dw@unimed.ac.id }

Universitas Negeri Medan, Medan, Indonesia¹,²

Abstract. This study aims to examine the self-resilience model instrument for drug initiation and habituation. The instrument test sample came from high school students in Medan City, Asahan Regency, Batubara Regency, and Deliserdang Regency. An instrument testing analysis technique is reliability validity testing with Cronbach's alpha value. The results of the trial are obtained, there are several invalid items so that the item is deleted and not used. Where as for realiability testing is fulfilled for all variable research instruments.

Keywords: Instrument testing, self-resilience, initiation, drug abuse.

1 Introduction

The increasing prevalence of drug users in the city of Medan needs to get serious attention. Drug abuse is carried out by elementary, junior high, high school and university students, students with high and low socioeconomic backgrounds. Parents have high and low education, seen from the residence of students in the city and in the village already involved with drug abuse cases. Teenagers are the largest number because individuals who are unstable, easily anxious, do not have personal maturity, in the face of challenges and life problem, survive to achieve this life goal called self-resilience.

The impact of drug abuse causes promiscuity, free sex, will increasing abortion among adolescents this condition cannot be left, it must be immediately overcome. Some efforts have been made by various parties such as the National Narcotics Agency (BNN), police, schools, families, etc. However, such efforts have not been adequate, now all parties must have severe attention to drug prevention in all circles.

The BNN Special Region of Yogyakarta Province has also compiled an anti-drug self-defense instrument called the Anti-Drugs Scale (ADS) measuring instrument consisting of 3 dimensions; self-regulation, assertiveness, and reaching out are used to determine the ability of individuals in the face of encouragement, desire, or influence for drug abuse. In the initial stage ADS was prepared using 60 items of the Behaviorally Anchored Rating Scale (BARS) scale model item. Furthermore, it was tested on 1,997 respondents spread in Jakarta, Bogor, Depok, Tangerang, Bekasi and tested on high school students, students, employees and households. The result is 47 valid items for the long form type and 23 short form type items [1].

Self-resilience measurement using ADS uses a low sample of indications of using drugs, while the instrument of this research is aimed at teenagers who are indicated by drug initiation and adolescents who are actively using drugs. So that the purpose of this study to try out the instrument model to build self-resilience to the initiation and habituation of drugs so that it can be used to prevent drug use in future researchers.

2 Methodology

Validity is a measure that shows the validity of an instrument. A good instrument has a high value of validity, and vice versa. The purpose of testing validity is to show how far the validity of the instrument measures what the instrument wants to measure [2]. Djaali and Mulyono suggested that internal validity or item validity was shown by how far the results of the items were consistent with the results of the overall instrument measurement [3]. Therefore, item validity is reflected in the magnitude of the correlation coefficient between
item scores and the instrument's total score. If the correlation coefficient between item scores and total instrument scores is positive and significant, then the item is considered valid based on the size of internal validity.

Reliability testing is a measurement of a group of homogeneous objects that can be trusted. A measurement result can be trusted if several times the measurement of the same subject group is obtained, the measurement results are relatively the same, as long as the aspect measured in the subject itself has not changed [2]. Reliability testing techniques are carried out in two ways, namely internally and externally. External reliability testing was obtained by retrying the questionnaire to the same respondents, then the results of the first trial were correlated with the results of the second trial so that this technique was also called the single test double trial technique. Of course, external reliability testing requires a lot of time and money. So as to overcome this, internal reliability testing is carried out, where internal reliability testing is obtained by analyzing data from one measurement result [4].

Several previous studies have tried to focus on research on the topic of drug abuse prevention. The National Narcotics Agency has formed a Community Prevention and Empowerment Agency (P2M) that oversees the results of the implementation of anti-drug activist action plans. Various P2M activities have been carried out to encourage people to avoid drug abuse. The establishment of the Anti Narcotics Task Force is an effort to reduce the prevalence of drug abuse and media facilities to convey information about drugs to the public [5]. In addition to the establishment of institutions, other efforts that can be done come from families. Where the family has a very urgent function to counteract the negative influence of the environment around family members. The results of Yusoff and Don's research explain that a good family function can increase adolescent self-resilience so that they can refrain from negative behavior [6].

Instrument test respondents consisted of high school students from Medan City, Asahan Regency, Batubara Regency, and Deliserdang Regency. Selection of respondents based on information provided by the teacher from sharing harmful activities carried out by students during school. Information data collection is carried out incidentally without being planned to avoid anxiety and rejection from students, so data collection efforts for each school are repeated.

Efforts to obtain a good instrument are tested for validity by the corrected item-total correlation method using the product moment formula the way that is done by measuring the correlation between the score of the item statement and the overall statement score. The calculation is done through the SPSS program. Item validity is set at an alpha level of 5%. Invalid instruments are not used in research. Instrument reliability was tested with the Cronbach alpha method.

### 2.1. Validity Test

Validity test aims to see whether the instrument used is valid or indeed in accordance with the measured variables. A valid instrument means a measuring instrument used to obtain valid data. Valid means that the instrument can be used to measure what should be measured [7]. The instrument validity testing technique used Cronbach alpha coefficient which is an internal consistency score model based on the average correlation between statement items. If a question item has a Cronbach alpha value in the alpha if item deleted column greater than the alpha Cronbach value of the entire measurement scale, then the item must be deleted or the item must be revised if the item is theoretically needed to be analyzed.

### 2.2. Reliability Test

Reliability testing is used to determine the consistency of the measuring instrument, whether the measuring device used is reliable and remains consistent if the measurement is repeated. The method used is Cronbach alpha. If the Cronbach alpha value is greater than 0.6, the instrument is reliable [7]. Then explained the validity and reliability of each variable. Research variables that will reveal drug initiation and habituation are described in the instrument lattice of each variable described in the following table.

#### a. The Effectiveness of Information Technology Utilization

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Descriptors</th>
<th>Item Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of identifying data</td>
<td>IT provides convenience in identifying data in</td>
<td>1,2,3,12,13,1</td>
</tr>
</tbody>
</table>
### b. Drug Hazard Awareness Education

#### Tabel 2. Drug Hazard Awareness Instrument

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Descriptors</th>
<th>Item Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sources of information about the dangers of drugs</td>
<td>Sources of information come from parents</td>
<td>1,2 (-)</td>
</tr>
<tr>
<td></td>
<td>Sources of information come from school teachers</td>
<td>3,4 (-)</td>
</tr>
<tr>
<td></td>
<td>Sources of information come from religious teachers</td>
<td>5,6,7 (-)</td>
</tr>
<tr>
<td></td>
<td>Sources of information come from friends</td>
<td>1,1</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td>8 (-)</td>
</tr>
<tr>
<td>Information about hazards, impacts and types of drugs</td>
<td>Information obtained from school teachers</td>
<td>12,13,14,15 (-)</td>
</tr>
<tr>
<td></td>
<td>Information obtained from religious teachers</td>
<td>16,17,18 (-)</td>
</tr>
<tr>
<td></td>
<td>Information obtained from friends</td>
<td>10,11,19,20,21</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td>11 (-)</td>
</tr>
<tr>
<td>Behavior avoids the</td>
<td>Examples of avoiding the dangers of drugs from</td>
<td>4,1</td>
</tr>
</tbody>
</table>

---

**Indicators Descriptors Item Numbers**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Descriptors</th>
<th>Item Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>the education world</td>
<td>+</td>
<td>8 (-)</td>
</tr>
<tr>
<td>IT makes it easy to build socialization</td>
<td>-</td>
<td>5,6,7</td>
</tr>
<tr>
<td>IT makes it easy to find out about drugs</td>
<td>+</td>
<td>8,10 (-)</td>
</tr>
<tr>
<td>IT provides ease of finding out about pornography</td>
<td>+</td>
<td>14,17 (-)</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td><strong>12</strong> 6</td>
</tr>
<tr>
<td>Ease of accessing data</td>
<td>T makes it easy to access data needed in the world of education</td>
<td>19,20,21,22,3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6,37,38</td>
</tr>
<tr>
<td></td>
<td>Ease of giving and receiving information through social media (social media)</td>
<td>23,24,25,26,2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7,30,31</td>
</tr>
<tr>
<td></td>
<td>Facilitate and facilitate the interaction of drug trafficking</td>
<td>- 28,29</td>
</tr>
<tr>
<td></td>
<td>Facilitate the distribution of pornographic images/videos</td>
<td>- 32,33,34,35</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td><strong>12</strong> 8</td>
</tr>
<tr>
<td>Number of individual users</td>
<td>Having a personal account in IT makes it easy and improves education</td>
<td>39,40,41,42 (-)</td>
</tr>
<tr>
<td></td>
<td>Users of social media account significantly influence each</td>
<td>43,44,45 46,47</td>
</tr>
<tr>
<td></td>
<td>More and more users of social media accounts make it easy to connect with drug sales</td>
<td>48,49 50</td>
</tr>
<tr>
<td></td>
<td>More and more users / users of Medos accounts make it easy to connect with pornographic sites</td>
<td>- 51,52,53,54</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td><strong>8</strong> 8</td>
</tr>
<tr>
<td>Area Coverage</td>
<td>Various educational science data obtained from various countries</td>
<td>63,64,70 (-)</td>
</tr>
<tr>
<td></td>
<td>Socialization among fellow IT users is not limited by time and place</td>
<td>55,56,5760 58</td>
</tr>
<tr>
<td></td>
<td>The interaction between drug trafficking between dealers and buyers is not limited by place</td>
<td>- 59,61,62</td>
</tr>
<tr>
<td></td>
<td>Get various pornographic sites from unlimited sources.</td>
<td>69 65,66,67,68</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td><strong>8</strong> 8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>40</strong> 30</td>
</tr>
</tbody>
</table>
### c. Life Skill

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Descriptors</th>
<th>Item numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication</strong></td>
<td>Communication skills in conveying intentions to achieve goals</td>
<td>1,3,4,5,6,7,8, 9,10,11,12,13,14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subtotal</th>
<th>13</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Altruism</strong></td>
<td>Behavior that prioritizes the interests of others</td>
<td>115,16,17,18, 19,20,21,22, 23,24,25,26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subtotal</th>
<th>12</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Making decision</strong></td>
<td>Skills to make decision in life</td>
<td>27,28,29,30, 31,32,33,34, 35,36,37,38, 39,40,41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subtotal</th>
<th>15</th>
<th>0</th>
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</thead>
<tbody>
<tr>
<td><strong>Responsible citizen</strong></td>
<td>Attitudes as citizens who comply with regulations</td>
<td>42,43,44,45, 46,47,48,49, 50,51,52,53, 54,55,56,57, 58,59</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Subtotal</th>
<th>17</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teamwork</strong></td>
<td>Skill to work in a group to obtain a goal</td>
<td>59,60,61,62, 63,64,66</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subtotal</th>
<th>8</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Critical thinking</strong></td>
<td>The ability to analyze facts to maintain ideas</td>
<td>67,68,69,70, 71,72,73,74, 75,76,77,78, 79,80,81,82, 83,84</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Subtotal</th>
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<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leadership</strong></td>
<td>Skill to influence others in purpose to obtain a goal</td>
<td>84,85,86,87, 88,89</td>
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<table>
<thead>
<tr>
<th>Subtotal</th>
<th>6</th>
<th>0</th>
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</thead>
<tbody>
<tr>
<td><strong>Problem solving</strong></td>
<td>Thinking skills in providing solutions to problem solving</td>
<td>90,91,92,93, 94,95,96,97, 98,99,100,101, 102,103,104, 105,106,107</td>
</tr>
</tbody>
</table>
### d. Spiritual Guidance

Tabel 4. Spiritual Guidance Instrument

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Descriptors</th>
<th>Item numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sincerity</td>
<td>Sincerity, honesty, willingness to expect God's blessing</td>
<td>1, 2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>Patience</td>
<td>Withstand trials, not irritable, and unhurried</td>
<td>7, 8, 9, 10</td>
</tr>
<tr>
<td>Calmness</td>
<td>The atmosphere of inner human life or human self which consists of feelings that cause humans to be restless</td>
<td>12, 15, 16, 19, 20, 21, 11, 13, 14, 17, 18,</td>
</tr>
<tr>
<td>Recognizing its existence as a creature of God</td>
<td>The ability to resolve yourself with others and the environment is aware that all human activities are following the provisions of God Almighty</td>
<td>22, 23, 24, 25, 26, 27, 29, 30</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>10</td>
</tr>
</tbody>
</table>

### e. Self Resilience to Drug Initiation and Habit

Tabel 5. Self Resilience to Drug Initiation and Habit Instrument

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Descriptors</th>
<th>Item numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenacity</td>
<td>Accuracy recognizes the selected activity</td>
<td>1, 2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>Toughness</td>
<td>Tough/strong in facing challenges</td>
<td>7, 8, 9, 12, 10, 11</td>
</tr>
<tr>
<td>Ability to develop self-strength</td>
<td>Able to develop self-strength against threats</td>
<td>13, 14, 15, 16, 17</td>
</tr>
<tr>
<td>Ability to face challenges</td>
<td>Able to face various challenges that damage self-potential</td>
<td>19, 20, 21, 22, 23, 24</td>
</tr>
<tr>
<td>The ability to face the interference that comes</td>
<td>Able to deal with interference coming from inside and outside of him</td>
<td>25, 26, 27, 28, 29, 30</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>7</td>
</tr>
</tbody>
</table>
3 Result and Discussion

3.1 Instrument Testing Effectiveness of Information Technology Utilization Variables

Based on the tests conducted on 82 samples obtained the validity of the instrument that all items totaling 70 items were declared valid because there was no Cronbach's alpha if item deleted value higher than the value 0.993. Likewise, reliability testing stated that the instrument was reliable to use, this was because the value of Cronbach's alpha was 0.993 greater than 0.6.

3.2 Testing Instrument Variable Education for Narcotics Hazard Awareness

Based on the tests conducted on 97 samples, the validity of the instrument was found that there were six invalid items, namely 9, 19, 21, 26, 30, and 32, this is because there is a Cronbach's alpha if item deleted the value that is greater than the value 0.983. Invalid instrument items will be discarded and not used for research data collection. Reliability testing stated that the instrument is reliable to use, this is because the value of Cronbach's alpha is 0.983 greater than 0.6.

3.3 Testing Life Skills Variable Instruments

Based on the tests carried out on 66 samples, the validity of the instrument was found that there were 3 invalid items, namely number 1, 2, and 113, this is because there is a Cronbach's alpha if item deleted value that is greater than the 0.965 value. Invalid instrument items will be discarded and not used for research data collection. Reliability testing stated that the instrument is reliable to use, this is because the value of Cronbach's alpha is 0.965 higher than 0.6.

3.4 Testing Spiritual Guidance Variable Instruments

Based on testing conducted on 83 samples, the validity of the instrument was found that the invalid items were 5 items, namely numbers 8, 10, 14, 20, and 21, this is because there is a Cronbach's alpha if item deleted value higher than the value 0.935. Invalid instrument items will be discarded and not used for research data collection. Reliability testing stated that the instrument is reliable to use, this is because the value of Cronbach's alpha is 0.935 greater than 0.6.

3.5 Testing Instrument for Variable Self-Resilience to Drug Initiation and Habit

Based on the tests conducted on 77 samples obtained the validity of the instrument that invalid items as many as 9 items, namely numbers 5, 10, 11, 15, 17, 18, 23, 24, and 30, this is because there is a value of Cronbach's alpha if item deleted which is greater than the value of 0.846. Invalid instrument items will be discarded and not used for research data collection. Reliability testing stated that the instrument is reliable to use, this is because the value of Cronbach's alpha is 0.846 greater than 0.6.

The model builds self-resilience to drug initiation and habituation consisting of 5 (five) variables, namely the effectiveness of the use of information technology, awareness of the dangers of drugs, life skills, spiritual guidance, self-resistance to drug initiation and habituation.

Instrument test respondents came from high school students in Medan City, Asahan Regency, Batubara Regency, and Deliserdang Regency. Selection of respondents based on information provided by the teacher from sharing negative activities carried out by students during school. This negative behavior is a strong presumption that the student has been contaminated by the behavior of drug users.

The results of testing instruments can be continued for research models to build self-resilience to drug initiation and habituation. Each research variable instrument has a Cronbach's alpha value if different items are deleted. Valid items if the value is smaller than Cronbach's Alpha will be used for research, while invalid items will be deleted from the list of research instruments.

Furthermore, the research instrument will be disseminated to the research object for the process of data collection and analysis to build a model of self-resilience towards drug initiation and habituation. The model will be used as a preventive measure against adolescents who take the initiative to use drugs and recovery measures for perpetrators who are used to using drugs.
4 Conclusion

The conclusions of the study found that: 1) testing the validity of the effectiveness of the use of information technology obtained 70 valid items; 2) testing the validity of education awareness of the dangers of drugs obtained 29 valid items; 3) testing the validity of life skills obtained 120 valid items; 4) testing the validity of spiritual guidance obtained 25 valid items; 5) testing the validity of self-resistance against drug initiation and habituation obtained 21 valid items; and 6) all research instruments are reliable.

References

Abstract. The problem in this research is how the management strategy of oyster mushroom cultivation in Mushroom House, Urban Village of Siumber Baru, sub-district of East Kisaran, District of Asahan. The purpose of this research is to find out the management strategy of oyster mushroom cultivation in Mushroom House, Urban Village of Siumber Baru, sub-district of East Kisaran, District of Asahan. This is a descriptive qualitative research; the informant is the manager and two employees of the Mushroom House. The data were collected by interview and documentation, and analyzed through: data collection, data reduction, data display, and conclusion. The results showed that the manager can develop and improve the quality of his business systematically in order to have a good management system in accordance with the management function, he can make good preparation for his business, he always chooses the superior oyster mushroom seeds, he takes care of the oyster mushroom that have been cultivated, and analyzed the oyster mushroom business opportunities and renewing the types of food that will be served. The interview revealed that the management strategy in improving the motivation of employees to build their own business by giving them knowledge with sincerity, give them strategy to to improve the quality of business and never give up.

Keywords: Cultivation; mushroom; strategy management.

1 Introduction

One of the most popular businesses nowadays is food business. Food business, especially horticulture, is currently aimed to strengthening food self-sufficiency, increasing public incomes, and improving nutrition through food diversification. Horticulture is one of the agricultural sub-sectors that occupy an important position in contributing to the Indonesian economy. Consumption of horticultural products, such as mushrooms, mushroom farming has become attractive business in agricultural sector due to its simplicity and flexibility of cultivation and quite profitable [1]. Mushroom continues to increase in line with increasing population, increasing incomes and increasing public knowledge about nutrition and health. This is the reason that this is the right time for horticulture farming to get serious attention, especially in the aspects of production and development of marketing system.

Mushrooms are a valuable part of the human diet and are an important food in the United States and worldwide [2]. Edible mushrooms include fungi that thrive on damp decaying organic matter alone or in combination with soil [3] as it depends on nutrients obtained from
dead and decaying materials [4]. Mushrooms are highly nutritious and environment friendly crops that carry numerous medicinal benefits. A literature and database review and several experiments were carried out because of the perturbing increase and exponential spreading of a major mistake thought scientific publications. Up to October 2015, more than 136 reports ensured that mushrooms contain flavonoids, however, 91% of the publications used an unspecific colorimetric method that was developed to quantify them in plants [5]. In fact, mushrooms do not contain flavonoids.

The cultivation of edible mushrooms carries great relevance in today's world in the context of a burgeoning population growth and extreme pressure on the environment [6]. But advances in research on mushroom breeding and production is very limited as compared to other crops. This maybe partly due to a lack of previous knowledge of the genetics and breeding system in this crop. Classical breeding in mushrooms has been difficult due to the predominantly secondarily homothallic life cycle of this fungus [4].

Mushrooms also contribute in creating the diverse menu of typical Indonesian food such as tempe and tape. Mushrooms are one type of horticultural products that can be developed and directed to improve the nutritional status of the community [7]. The use of pesticides in mushroom cultivation is relatively small. Therefore, the fungus is a food that is safe for consumption. In addition to the relatively cheap price, then almost all people can afford it.

2 Methodology

The mushrooms are advantages to grow as compared to button mushrooms. They requires no arable land for production and the abundant agriculture waste found countrywide offers opportunity for production, which in turn provides a more economical and environmentally friendly disposal system [8], and also they can easily grow in local conditions if the appropriate requirements of food and moisture for growth are available[9] Oyster mushroom (Pleurotus ostreatus, Kummer) is the second largest commercially produced and important edible mushroom in the world market [10] after Agaricus mushrooms [11] Oyster mushrooms have been cultivated using tree logs or containers such as shelves, boxes, bags, and bottles containing growing media.

In the middle of the rush of market competition for income generation, one community Urban Village of SiumberBaru, sub-district of East Kisaran, District of Asahan opened a business in the field of food where oyster mushroom is the main ingredient however in the present study it is clearly indicated that waste paper can be used as the sole or combined with an enriched substrate for cultivation of the oyster mushroom; a valuable and highly nutrient fungal type [11]. From the observations that have been done, the mushrooms used are mushrooms from their own cultivation. The results of the cultivation is processed into various types of food and served to customers. Based on the new innovation, the people of Kisaran visit many mushrooms houses every day. Increased visitors cause business owners are often out of stock of oyster mushrooms that ultimately do not satisfy visitors. Not only that, the lack of employees and small cultivation area also given less attention, therefore that the management still has many shortcomings. The area of the cultivation, parking lot, and space for the visitors are still very inadequate because it still uses the area of the house manager. In addition, the manager also instill with the concept of food will be cooked if it is ordered in order to maintain customers satisfaction. However, the consequence of this concept is that the food can be served within half an hour and sometimes even up to 1 hour after being ordered.
Even more, the absence of entertainment such as television, music or radio that makes visitors bored waiting. Oyster mushroom was grown on rice (Oryza sativa L.) straw alone (100:0), rice straw + peanut (Arachis hypogaea L.) shell (75:25, 50:50, and 25:75 w/w), and peanut shell alone (0:100). Responses to cultivation in boxes or bags were determined. Total nitrogen, protein, potassium, calcium, magnesium, phosphorous, and dry matter were measured. Mixing rice straw with peanut shell (75:25 w/w) increased antioxidant capacity, magnesium, and flavonoid contents of fruit bodies [12].

To see, know and describe the actual situation in detail and actual by looking at the problems and objectives of research as previously stated, the research method used in this study leads to the use of qualitative research methods [13].

This research is qualitative research with descriptive analysis. This study did not use populations and samples but used the subject of the study. The term research subject refers to the person or individual or group who is made into the business unit or case unit under investigation. Research subject is the main component that has important position in a research, because in this research subject there are variables that become studies to be studied [14]. The subjects in this study are managers who also worksas an employee, and two employees. So the subject of this study are three peoples which became an important source of information. The data analysis used in this research is descriptive qualitative analysis technique, where the implementation phases are data collection, data reduction, data presentation/display data, and conclusion [15][16].

The data analysis in this qualitative research were done in a cycle and during the research process. Therefore, since the beginning of the research, researchers have to start searching data from the pattern of information, explanations, recorded information from informants and documentation [16].

### 3 Result and Discussion

Basically, the manager educational background is bachelor of education, just like the wish of his parent. However, due to his intense desire to create employment opportunities, when he graduated from college he decided to open a business [17]. Various attempts had been made but failed. Starting from opening a sate stall, selling crackers until finally he wandered to Malaysia to become TKI (Indonesian Workers). When in Malaysia he got the knowledge of oyster mushroom cultivation. He attended the course and thought to open a business of oyster mushroom cultivation in Indonesia. After three months following the course, in the same year he decided to return to Indonesia to implement the knowledge gained. He founded an oyster mushroom cultivation course in 2007. In 2008 he started an oyster mushroom cultivation business and in 2012 he innovated to process the basic ingredients of oyster mushrooms into a food in the Mushroom House.

Oyster mushrooms are foods high in protein, contain minerals and low in fat. Oyster mushroom protein content ranges from 20-40% dry weight so it is better when compared with other protein sources such as soybeans and nuts. Besides being a source of protein, vitamins and minerals, oyster mushrooms also contain compounds that act as anticancer or antitumor, antikolesterol and antioxidants. Lectin compounds in white oyster mushrooms have been proven as antitumor compounds. Therefore, it is not surprising that in Japan, the oyster mushroom is called a medicinal mushroom (hiratake).
Currently Mushroom House has six employees, consisting of two men and 4 women. The opening schedule of Mushroom House is on Monday to Sunday (excluding holidays and closed Friday) starting at 13.30 WIB to 20.30 WIB. The location of Mushroom House is on Budi Utomo Street no.116 Urban Village of SiumbutBaru, sub-district of East Kisaran, District of Asahan.

The vision of the Mushroom House is "to promote mushrooms as a source of healthy food and improve the welfare of the community". The mission of the Mushroom House are; (1) improving the quality of oyster mushrooms with the best quality, (2) opening oyster mushroom training to the community, (3) socializing the benefits of oyster mushrooms for health with a variety of processed products, and (4) increasing business in the field of community economy, especially agriculture.

The management strategy of oyster mushroom cultivation in Mushroom House is a step taken by the manager in improving the quality of his business through: having a good management system in accordance with the management function, preparing the oyster mushroom well, selecting the best oyster mushroom seeds, look after for oyster mushroom which have been cultivated, analyzing oyster mushroom business opportunities and renewing the types of food that will be served [6].

![Fig. 1. Strategy of Entrepreneurship Management of Oyster Mushroom Cultivation at Mushroom House](image)

Based on “Fig 1” we know that through the strategy undertaken by the manager in improving the quality of his business, it will increase the public interest to be more familiar with the benefits of oyster mushrooms and try the processed products. It also increases the economic life of the manager and his employees. All of activities employees depend on the training, because training is an activity to improve the ability, form skills and improve the performance of individuals or groups in performing their duties by improving skills, knowledge, skills, attitudes and behaviors that are specific to the needs or job [18]. The strategies were capable of being successful innovation by interacting and cooperating with external sources, and performing certain adjustment with local condition.

Result of the interviews on the manager and employees of the Mushroom House, the authors can conclude that the Mushroom House manager performs a good strategy in improving the quality of his business. Where the strategy undertaken by the manager is to apply the management functions well, installing billboards at some point of the roads and start his business first, managers do door to door promotion to government offices, schools or home residents to peddle oyster mushroom cultivation made. In addition, the existence of culinary
business and training as a place of people who want to taste processed oyster mushrooms or people who want to learn to cultivate oyster mushrooms.

Aspects that need to be improved in improving the quality of his business is the widening of cultivated land and also a comfort place to eat for the visitors. Parking land should also be wider considering the number of visitors who come. Fewer employees are also an aspect that managers need to improve. That way, it is possible to cultivate this oyster mushroom into a great effort [19].

In the previous section, researchers have describe the research result. Based on the research that is tested in data analysis, it is found that the management strategy of oyster mushroom cultivation at Rumah Mushroom are as follows: From the interviews that have been done with Mr. Ahmad Rofi'i (Manager), it can be explained that; (1) the manager applies management functions, namely planning, organizing, staffing, directing and controlling for the success of their business, (2) the manager has their own strategy to develop their business by opening a culinary business with the mushrooms processed by themselves, open training, making billboards, brochures and do door to door promotion, (3) the manager applies the theory of preparing the business properly, such as location, selection of employees, and the use of tools and materials appropriately, (4) pay full attention on the growth of oyster mushroom by keeping humidity and room temperature, (5) the manager provide knowledge about oyster mushroom cultivation to employees with hope that their employees can open their own business, and (6) the manager always updates the type of food every six months based on the consumer interest.

From the interviews conducted with Rio (employees), it can be explained that; (1) the manager always assigns employees to socialize the Mushroom House, either in the mass media, print media or personally to the public, (2) the manager is very good in preparing business, it can be seen from the selection of locations, selection of employees, and the selection of tools and materials used, (3) the manager always assigns employees to water the growth process space in order to keep the humidity and room temperature for good mushroom growth, (4) the manager always motivates employees to open their own business in order to improve the economic level of its employees, and (5) the manager always renews food type every six months based on the consumer's interest.

From the interviews that have been done with Sri Rahayu (employee), it can be explained that; (1) the manager accepts anyone who wants to do research, community service or record his cultivation of oyster mushroom so it will be known by society and also increase society insight, (2) the manager is very concerned about every detail of his business whether it's location, seeds or tools and materials, (3) the manager always assigns employees to water the room two times a day (morning and afternoon) to keep the humidity and room temperature growth process, and (4) the manager always provide knowledge about the cultivation of oyster mushrooms with hope that employees can open their own business.

Based on the results above, it can conclude that by knowing the management strategy of oyster mushroom cultivation, the manager can develop and improve the quality of his business systematically in order to have a good management system in accordance with management functions, prepare the business of oyster mushrooms well, choose the superior oyster mushroom seeds, take care of the oyster mushroom plants that have been cultivated, analyzing oyster mushroom business opportunities and renewing the types of food that will be served. Then the manager also plays an important role in improving employee motivation to build their own business by providing knowledge with sincerity, providing procedures to improve the quality of business and never give up spirit. If the entrepreneurial spirit is entrenched
within the employees, then the manager managed to achieve the vision and mission, one of which is to prosper the community through the cultivation of oyster mushrooms.

There were many things that so important to be repaired for the next program. The aspects that need to be improved in improving the quality of the business is the widening of cultivation land and also add more place to eat for the visitors. In addition, the parking lot should also be wider considering the number of visitors who come. Employees also need addition considering the number of visitors so they dont have to wait long time before the order come.

The government should also pay more attention to potential self-sufficient enterprises in small areas so that entrepreneurs in Indonesia can improve the economy of his family without having to become unemployed or expect work in government office, because oyster mushrooms are third largest cultivated mushroom. Mushrooms (*Pleurotus spp.*) belonging to the class basidiomycetes and agaricaceafamily [7]. It is expected that the Mushroom House employees will soon start their own business in order to create more job opportunity in the District of Asahan. That way, the unemployment rate in the Asahan area will reduce.

### 4 Conclusion

The manager of Mushroom House has done a good business strategy in developing his business, where managers perform entrepreneurial strategy by good management in accordance with the management function, preparing the business oyster mushrooms well, choose the best seeds of oyster mushrooms, take care of oyster mushroom plants that have been cultivated, analyzing oyster mushroom business opportunities and renewing the types of food served that will be able to support the quality and quantity of its business.

Related to the vision and mission made by managers which is to improve the level of economy and community prosperity, manager taught how to cultivate oyster mushrooms to all employees, motivate employees to start their own business and never give up. Managers also provide rewards to employees who do not violate the rules and motivated to work harder.

### References


Development of interactive tutorial video based on curriculum based on Indonesian national qualification framework in machinery material Basic completion of completion

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Abstract. This development research aims to develop a curriculum-based interactive video tutorial based on the Indonesian national qualification framework in the basic turning competency machining course at the Mechanical Engineering Education Study Program. Curriculum-based interactive video tutorial based on the Indonesian national qualification framework at the engineering course This basic turning competency is designed to be able to improve student learning outcomes so that they can fully understand the material provided in the engineering course. This study uses the development method of the IDI (Instructional Development Institute), as for the procedure for developing the IDI, namely: define, develop, and evaluate. Type of data is primary data where data is provided by media experts, lecturers and students. The data analysis technique used is descriptive data analysis technique that is by describing validity, practicality and effectiveness using a curriculum-based interactive video tutorial based on the Indonesian national qualification framework in the basic turning competency machining course. The results obtained from this research and development are as follows; a Material expert: (1) Quality of learning material with a validation value of 0.90; (2) Quality of Learning Strategies with a validation value of 1.10; (3) About the learning delivery system with a validation value of 0.88. So that it can be seen the trend level of the assessment of material experts in a score of 0.96 with a range of "Valid"; b. Learning design experts: (1) Quality of learning design with a validation value of 0.94; (2) Quality of Learning Strategies with a validation value of 0.91; (3) About aspects of the quality of the interaction design with a validation value of 0.91 (4) Regarding the aspect of presentation quality with a validation value of 0.89; c. Media Experts: (1) Programming Aspects with validation values of 0.92; (2) Graphic design aspects on technical or display quality with a validation value of 0.94; (3) Technical Quality Aspects or performance with a validation value of 0.91; So that it can be seen the level of tendency of experts or material expert validators, learning design experts and media experts in the average score of 0.91 in the "Valid" category. Practical test results of curriculum-based interactive video tutorials based on the Indonesian national qualification framework in machining courses Basic turning competencies by lecturers and students are conducted through lecturer and student response questionnaires showing the results of practical test curriculum-based interactive video tutorials based on the Indonesian national qualification framework in machining courses Basic turning competency courses by the response of the lecturer to show the level of practicality with the percentage of 88.75% in the practical category. Practicality test the curriculum-based interactive video tutorial based on the Indonesian national qualification framework at the machining course the basic turning competency by the student response shows the practicality level with the percentage of 98.2% in the very practical category. A curriculum-based interactive video tutorial based on the Indonesian national qualification
framework in the machining course. Practical basic turning competencies meaning facilitating students. Effectiveness test results of curriculum-based interactive video tutorials based on the Indonesian national qualification framework in machining courses. Basic turning competencies are effective in improving student learning outcomes before using after Animation-Based Multi Media. The increase in student learning outcomes was marked by an increase in the number of 59 students who passed as many as 55 people, 93.22%. Based on the findings of this study, it was concluded that a curriculum-based interactive video tutorial based on the Indonesian national qualification framework in machining courses Effective basic turning competencies is valid, practical, and effective to be used as a learning media in basic network training eyes.

Keywords: Development of Management Models, Expertise Competencies, Production Units, Vocational Schools.

1 Introduction

Education is a planned effort to realize the learning atmosphere and the learning process so that students effectively develop their potential to have spiritual strength, personality and skills possessed by themselves, the people of the nation and the state. Educational success depends on changing attitudes or achieving the final results of learning. Based on the government regulation of the Republic of Indonesia Number 31 of 2013 concerning National Education Standards, Article 19 paragraph 1 states that: The educational process in educational units is held in an interactive, inspirational, fun, challenging, motivating student to actively participate and provide sufficient space for initiatives, creativity, and independence in accordance with the talents, interests, and physical and psychological development of students (Government Regulation, 2013).

The Indonesian National Qualifications Framework (KKNI) curriculum will improve the quality of university graduates, that in the IQF curriculum contains subject competencies consisting of cognitive, psychomotor, and affective or attitude. So far there are still many courses that only use cognitive elements (Hendrawan, 2012: 1). Machining learning is a practical learning that is tied to skills in working on an object with the help of a machine. In machining learning will get lessons about turning. Turning is a process for forming objects by means of feeding by cutting or reducing the dimensions of the workpiece (Daryanto, 1996: 1). Basic turning is the first practice course that works using a lathe. In basic turning learning students will get material about straight, groove, taper and outer thread turning.

Learning media is a tool in the learning process both inside and outside the classroom, so media selection requires many considerations, including the feasibility of the media used [1]. Interactive multimedia provides more value to learners to be actively involved in the learning process, thus providing a deeper learning experience. In addition, the use of multimedia in learning is suitable for various learning styles because it prioritizes various aspects, such as audio and visual aspects simultaneously. To form effective, interesting and not boring learning for students, it is necessary to develop learning media that are in accordance with the conditions and characteristics of students. Learning curriculum-based interactive video tutorials based on the Indonesian national qualification framework is learning that uses media in the form of moving images, so learning will be more meaningful and effective. According to [2] learning video media is a media that presents audio and visual which contains good learning messages that contain concepts, principles, procedures, application theories to help
understanding a good learning material. Learning that means having meaning as an in-depth understanding of the material, includes paying attention to important aspects of the material presented by educators, organizing it mentally into a cognitive structure.

The basic machining practice is the first practical course that deals with real machines, so in this practice students are stressed to have the skills and knowledge about the procedures for turning with a real machine. In terms of practice, educators have important things, namely educators who regulate the teaching and learning process. The success of the learning process is very dependent on the delivery of material provided by the educator. The problem in delivering basic machining material is the loss of the lecturers' voice due to the noise of the workshop area. Apart from these problems, other problems that occur in learning that educators must demonstrate how to turn procedures. Demonstration of the turning is less efficient because a lot of time is taken and students must cluster in one machine. The time is long because the material delivered is very long and the procedures that are applied are very large, in addition to this the hordes of students make the sound of educators unable to be heard clearly because of the noise of the process of shooting and irregular learners.

As a result of this learning, many students are not able to get good information, so that the information available to students is difficult to imply. Many students take basic machining courses but the practice of turning is done by a classmate. Therefore, researchers will help provide information to students by developing the development of curriculum-based interactive video tutorials based on the Indonesian national qualification framework in the basic turning competency machining course. This media is expected to be able to be used as a learning tool for students who do not understand how to operate a lathe and do turning.

2 Methodology

The development model used is the Instructional Development Institute (IDI) model. According to (Gustafson & Brach, 1997, IDI applies the principles of a system approach that includes the stages, namely discovery (define) or needs analysis, development (develop), and evaluation (evaluate). The first stage is the discovery stage (define) which contains steps of background analysis and problem identification. The second stage is the development stage which contains the preparation of the initial form (product prototype) and product validation, while the third step is the evaluation / evaluation stage which contains the test steps and analysis of trial results.

The product trial was conducted to find out the practicality and effectiveness of the interactive video tutorial on the engineering course. The trial was carried out in the Faculty of Engineering, Department of Mechanical Engineering Education, State University Academic Year 2018/2019.

The subject of the trial was an educational student with a UNIMED FT machine who was given learning using a curriculum-based interactive video tutorial based on the Indonesian national qualification framework in the basic turning competency machining course. Subjects for testing the development of curriculum-based interactive video tutorials based on the Indonesian national qualification framework at the engineering course Basic turning competencies are students of the Mechanical Engineering Education Department, Medan State University, in machining courses in the Odd Semester academic year 20018/2019.
a. Data Collection Instrument

The instruments developed to collect data in this study are as follows: (1) Validation sheet; (2) Practical Sheet; (3) Effectiveness Sheet; (4) Data Analysis Techniques. Data from curriculum-based interactive video tutorial validation based on the Indonesian national qualification framework in machining subjects Basic turning competencies in the form of content validation, presentation validation, and format validation were analyzed using the following steps:

Syafuddin Azwar (112-112: 2013), one of the statistics that shows the validity of item content is as proposed by Aiken (1985). Aiken has formulated the Aiken V formula to calculate the content-validity coefficient based on the results of the expert panel's assessment of n people on an item in terms of the extent to which the item represents the measured construct. In this case representing the measured construct means the item in question is relevant to the behavior indicator, because behavioral indicators are operational translations of measured atribbut. The judge is done by giving a number between 1 (i.e. the expression is not representative or very irrelevant) up to 5 (i.e. very representative or very relevant).

Table 1: Research design

<table>
<thead>
<tr>
<th>Interactive learning media with the Edmodo application In Engineering Drawing Course</th>
</tr>
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<tbody>
<tr>
<td>Use curriculum-based interactive video tutorials based on the Indonesian national qualification framework in the basic turning competency machining course</td>
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<td>μ A1</td>
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3 Result and Discussion

3.1. Expert Validation Results

Determination of validity data for curriculum-based interactive video tutorials based on the Indonesian national qualification framework in machining subjects Basic turning competencies as learning media are using questionnaires. In this case the researcher gave a questionnaire to six validators who validated the media being developed, namely: (1) Three validators were called the first material experts to carry out validation and assessment of the content (material), (2) Three validators called Learning design experts, (3) Three The validator is called the Learning media expert.

In this development research produces a learning media that is multi-media based animation that is stated to be very valid and the basic turning tutorial video has fulfilled several aspects with validity values namely:

Table 2: Expert Validation Result

<table>
<thead>
<tr>
<th>No</th>
<th>Expert</th>
<th>%</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Material Expert</td>
<td>0.96</td>
<td>Valid</td>
</tr>
<tr>
<td>2</td>
<td>Learning Design Expert</td>
<td>0.73</td>
<td>Valid</td>
</tr>
<tr>
<td>3</td>
<td>Media Expert</td>
<td>0.87</td>
<td>Valid</td>
</tr>
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</table>
From the table above can be explained as follows, a. Material experts: (1) Quality of learning material with a validation value of 0.909; (2) Quality of Learning Strategies with a validation value of 1.10; (3) About the learning delivery system with a validation value of 0.88. So that it can be seen the trend level of the assessment of material experts in a score of 0.96 with a range of "Valid". b. Learning design experts: (1) Quality of learning design with a validation value of 0.94; (2) Quality of Learning Strategies with a validation value of 0.91; (3) About aspects of the quality of interaction design with a validation value of 0.90 (4) About aspects of presentation quality with a validation value of 0.73; c. Media Experts: (1) Programming Aspects with validation values of 0.92; (2) Graphic design aspects on technical or display quality with a validation value of 0.94; (3) Technical Quality Aspects or performance with a validation value of 0.93; So that it can be seen the trend level of experts or material expert validators, learning design experts and meida experts in the average score of 0.87 in the "Valid" category.

3.2. Practicality Test Results
The results of the practical test of basic turning tutorial videos by lecturers and students were carried out through teacher and student response questionnaires indicating the results of the practical test of basic turning tutorial videos by lecturer responses showed a level of practicality with 88.75% in the practical category. The practical test of the basic turning tutorial video by the lecturers' response showed a level of practicality with a percentage of 98.2% in the very practical category. The practical basic turning video tutorial means making it easier for students to understand basic turning learning. Rudi Susilana and Cepi Riyana, (2007: 03) revealed that the good and bad of learning is supported by users of learning media. The basic turning tutorial video is able to make the learning atmosphere pleasant, because students are more motivated to complete learning.

3.3. Effectiveness Test
Learning outcomes data was taken aiming to see the extent of student achievement in participating in the learning process by using a curriculum-based interactive tutorial video score based on the Indonesian national qualification framework in the basic turning competency machining course. Data on learning outcomes were taken after 4 x meetings in learning, with 30 multiple choice questions. From the data obtained 55 students who have completed (93.22%) of the 59 students and students who have not finished are as many as 4 people (6.78%), an increase of 18 graduates or 60.00

4 Conclusion
From the results and discussion of research on the development of curriculum-based interactive video tutorials based on the Indonesian national qualification framework in the basic turning competency machining course stated earlier, it can be summarized as follows:

The video tutorial product specifications developed by researchers can be explained as follows: (a) This media base turning tutorial video was developed using camtasia8 software. And flash 8. (b) This media is a learning media for basic turning tutorial videos that are operated independently. (d) The tutorial video material is basic turning. (e) this video tutorial contains the basic turning learning component. (f) Minimum computer requirements for
The form and content of the basic turning tutorial videos are in the form of CDs (Compact Disks) that contain files with the extension "exe" on the composition of the basic turning material, the availability of tutorial videos on video pages, musical instruments on the home page, and images on each engineering subject matter audio system.

In this development research produces a learning media that is multi-media based animation that is stated to be very valid and the basic turning tutorial video has fulfilled several aspects with validity values, namely: a. Material experts: (1) Quality of learning material with a validation value of 0.909; (2) Quality of Learning Strategies with a validation value of 1.10; (3) About the learning delivery system with a validation value of 0.88. So that it can be seen the trend level of the assessment of material experts in a score of 0.96 with a range of "Valid"; b. Learning design experts: (1) Quality of learning design with a validation value of 0.94; (2) Quality of Learning Strategies with a validation value of 0.91; (3) About aspects of the quality of interaction design with a validation value of 0.90 (4) About aspects of presentation quality with a validation value of 0.73; c. Media Experts: (1) Programming Aspects with validation values of 0.92; (2) Graphic design aspects on technical or display quality with a validation value of 0.94; (3) Technical Quality Aspects or performance with a validation value of 0.93; So that it can be seen the trend level of experts or material expert validators, learning design experts and media experts in the average score of 0.87 in the "Valid" category. Where according to Trianto (2010: 269) Valid means that it has provided accurate information about teaching materials developed.

The results of the practical test of basic turning tutorial videos by lecturers and students were carried out through teacher and student response questionnaires indicating the results of the practical test of basic turning tutorial videos by lecturer responses showed a level of practicality with 88.75% in the practical category. The practical test of the basic turning tutorial video by the learners' response showed a level of practicality with a percentage of 98.2% in the very practical category. The practical basic turning video tutorial means making it easier for students to understand basic turning learning. Rudi Susilana and Cepi Riyana, (2007: 03) revealed that the good and bad of learning is supported by users of learning media. The basic turning tutorial video is able to make the learning atmosphere pleasant, because students are more motivated to complete learning.

Effectiveness Test Results. Data on learning outcomes were taken after 4 x meetings in learning, with 30 multiple choice questions. From the data obtained 55 students who have completed (93.22%) of the 59 students and students who have not finished are as many as 4 people (6.78%), an increase of 18 people graduated or 60.00%.

References

Developing Practice Handbook of Group Guidance Used PKC-KO Technique to Group Guidance Practice Subject

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Abstract. This study aimed to develop practice handbook of group guidance used PKC-KO technique to group guidance practice subject of guidance and counseling students on third semester Education Faculty, UNIMED. This study was research and development followed Borg and Gall model. Subject of this study are experts and students of guidance and counseling department on third semester. Expert subjects are content expert and media expert. Subject method used purposive sampling. Data collect method used questioner. Product trial on this research and development of guide book used two expert judgement validation, the first field product trial to 40 students and operational field product trial to 100 students. The Results of this development research were guide book of group guidance used PKC-KO technique based on content expert validity obtained 97,5 and based on media expert validity obtained 85. The result of the first field product trial obtained 93 and the result of operational product trial obtained 93,26 in very good criteria. It can be concluded that practice handbook of group guidance used PKC-KO technique are feasible to use as learning media on group guidance practice subject.

Keywords: Developing practice handbook, group guidance, PKC-KO technique.

1 Introduction

Group Guidance Practice[1] is a practical course with a load of 3 credits and is given in the third semester. According to the curriculum in the Guidance and Counseling, State University of Medan, this course is included in the main subject group so that all students must take after obtaining group guidance theory courses in the second semester. The purpose of this course is to equip students in shaping and developing basic professional skills in group guidance. Through this course, students are expected to aid needed by individuals in group situations by practicing basic procedures and techniques in group guidance.

The results of observations and interviews with several lecturers who had taught Group Guidance Practice course in the Department of Guidance and Counseling, Medan State University said that Group Guidance Practices were carried out in large classes. Lecturers generally do not provide a guidebook to be given to students so that students can practice independently. If this system continues to be carried out, the competencies and skills of students in practice cannot be honed in depth because it is not yet clear about the practical application of lecturers and students without a guidebook.

Students’ competence in the practice of counseling guidance can be trained independently by practice outside the hours of the course to answer the challenges of the
Indonesian National Qualifications Framework (KKNI) where graduates of S-1 have reached level 6 which means being able to apply their fields of expertise and use knowledge, technology, and / or art in their fields in solving problems and being able to adapt to the situation at hand, mastering the theoretical concepts of certain fields of knowledge in general and the theoretical concepts of specific parts in the field of knowledge in depth (Kemendikbud, 2014).

KKNI curriculum is realized in several assessments, one of which is the student’s project assignment in conducting group guidance practices. On the other hand, students must integrate competencies with characters in accordance with the motto of the State University of Medan, the character-building university. Students are required to have 6 pillars of character including honesty, respect, fairness, caring, responsibility and citizenship. Through appreciation of these character values, it is hoped that there will be a formation of teacher candidates with character. Thus, it is necessary to integrate characters in the courses implemented in the lecture guide book which is ISBN for group guidance practice course which can also be used as a document in completing the attachment of Guidance and Counseling Department accreditation forms at the end of 2019.

Based on the description above, it is clear that the importance of group guidance practice manuals is complemented by group format smart character learning (PKC-KO) for the implementation of lectures in an educational institution. To be able to achieve these expectations, this study is entitled "Development of a Guidebook on Smart Character Learning (PKC-KO) for Group Guidance Practices for FIP III Guidance and Counseling Students in Medan State University"

The purpose of this study was the availability of an ISBN PKC-KO guidebook for the Group Guidance practice course for students of the third semester Guidance and Counseling Department. The expected outcome of the research is PKC-KO practice handbook for the practice of Group Guidance courses for students in the third semester of Guidance and Counseling Department State University of Medan.

2 Methodology

2.1 PKC-KO Practice Handbook

Practice Handbook[2] are often referred to as manuals, guidebooks, and handbooks. Effendy said that the guidebook is a book that contains information and instruction. Which is a guide for the reader to know something completely. The practicum guide book is an independent learning book which includes a series material that are presented systematically so that students can learn with or without a teacher. According to Prayitno and Maryami (2012) of practicum activities planned systematically to help students to be able to carry out group counseling practices well so that the goals of group counseling can be achieved. Where the contents of the practicum guide book are in the form of instructions and descriptions for practicum.

Guidebook is one form of teaching material that is packaged in a complete and systematic manner which includes a set of learning experiences as a learning tool that is independent so that students can learn independently. This opinion is in line with the Ministry of National Education (2008: 20) which explains that the guidebook is a set of teaching) the practicum guidebook is a book that contains the rules for implementing more detailed practicum activities so as to facilitate the implementation of practicum activities. The PKC-KO
practicum guide book is an independent learning book which includes a series of PKC-KO practice procedures that are systematically arranged to assist students in implementing PKC-KO, with the aim of improving the efficiency and effectiveness of theoretical learning at the campus, both time, facilities and energy in order to achieve optimal PKC-KO implementation. The PKC-KO practicum manual is used to assist students in carrying out practice. Basically, the PKC-KO book used by students today only contains theory and limited implementation instructions.

[3] mention several steps in the preparation of the guidebook are as follows: (1) determine competency standards, (2) carry out a need's analysis of the learning guidebook, (3) drafting a guidebook, (4) do trial of draft manuals, (5) validation, (6) revision and production. By considering the steps in preparing the guidebook, making the development process of the guidebook will be structured.

The aspects and indicators that are used to evaluate the lesson guide book so that knowing a good guidebook is to consider assessment aspects such as (1) aspects of feasibility of content, (2) linguistic aspects, (3) aspects of presentation, and (4) aspects of graphics. From these aspects it can be used as a reference to make an instrument for assessing the feasibility of a guidebook (Depdiknas, 2008: 28).

2.2 Group Guidance Practicum

Practicum comes from the word practice which means the actual implementation of what is called in the theory. While practicum is part of teaching that aims to get students the opportunity to test and carry out in real circumstances, what is obtained from theory and practice lessons (KBBI, 2001: 785). This group guidance practice is one of the subjects in the Guidance and Counseling Study Program as a follow-up to the Guidance and Group Counseling courses that were received in the previous semester. In this lecture is more emphasized and deepened regarding the application of each group guidance and counseling techniques, so that students can apply the service in accordance with the interests.

2.3 How to Implement Group Guidance Practicum

Prayitno (2012: 20) distinguishes the stages of PKC-KO activities at each meeting: (1) escort, (2) Transition, (3) Discussion of Topics, (4) Inference and (5) Closing. Stage I: Escort Activities that must be carried out at this stage are: 1) Pray, 2) Pronounce the Five Principle text, 3) The facilitator receives openly and expresses gratitude for the attendance of the participants, 4) Explains the background of the PKC-KO activities, 5) Explains the purpose of the CCP activities KO, 6) Explain ways / activities in PKC-KO, 7) Introduce yourself and Games.

Stage II is transition. Some of the activities that need to be carried out by the facilitator at this stage are: 1) Explain group activities, 2) Question and Answer, 3) Share sheets or pocket books, 4) Participants learn the pocket book, 5) Link the values of smart character with life. Stage III: Discussion of Topics. Some of the activities carried out at this stage are: 1) explain the Topic of the Discussion, 2) provide a topic source (if the topic of the assignment), 3) determine the topic to be discussed, 4) discuss the topic.

Stage IV is inference; Activities carried out at this stage are: 1) explaining the meaning of conclusions, 2) Participants assessing self-improvement, 3) Giving responses, 4) Discussing further activities. Stage V is Closure; The activities carried out in the closing stages are: 1) Say thank you, 2) Establish a place and time for follow-up activities, 3) state the activities end and close, 4) pray, 5) closing session.
The research carried out is the type of research and development (Research and Development or R & D). Development research steps followed Borg and Gall (1983) in [1] said that the model of development has the following steps:

The First is research and information gathering included needs analysis. In the initial research stage, data collection was done through observation and interviews with lecturers who supervised group guidance courses and counseling and guidance students on March 27, 2018. Based on the results of the interviews, information was obtained that there was no group guidance manual that could be used as a learning medium. In addition, the results of the needs analysis for students on April 3, 2018 regarding the need to develop group guidance manuals for students of guidance and counseling showed a very high category of 95%. Based on the results of the needs analysis conducted it can be concluded that the development of the PKC-KO guidebook for group BK practice subjects is in accordance with the conditions in the study program.

On the other hand, Study of literature is also important at this stage, a variety of literature studies began to be carried out by studying the relevant literature and in accordance with the variables of the research that will be developed, namely the literature relating to group guidance practices with intelligent character learning (PKC-KO). Based on the literature in the discussion of literature review, the related material are 1) Counselor's role in all PKC-KO activities; 2) Points of intelligent character values; 3) Areas of discussion; 4) Mechanism for submitting topics; 5) Discussion of topics; 6) The role of participants in PKC-KO activities; 7) Preparation of activities; 8) Group games; 9) Stages of PKC-KO activities; 10) Transition Stage of PKC-KO activities; 11) Stages of discussion on the topic of PKC-KO activities; 12) Stages of conclusion of PKC-KO activities; 13) Stages of closing PKC-KO activities

The second is planning. The media developed in this study is media development in the form of a guidebook. The guidebook is one of the media that contains elements of pictures, texts and independent tasks. This is intended to bring positive enthusiasm from students. The guidebook material contains guidelines for group guidance practices.

The third is initial product development. The initial product development is making and compiling material about group guidance practices with PKC-KO, then used as a guidebook (draft 1). The fourth is the initial field trial is to test the quality of the guidebook. This trial was conducted to measure the feasibility of the guidebook through the validation of material experts and media experts. The fifth is revision of the initial field trial of the quality of the guidebook that has been tried out to material experts, media experts, and BK service experts and then revised according to what is suggested as a guidebook (draft II). Afterward, the sixth is the main field trial, piloting the guidebook in a small group of 10 students of the trial subjects using a sample selection technique that is random sampling.

The seventh is revision of the main field trial, if there is a lack of satisfactory results from the guidebook or inappropriate material in the main field test, the guidebook is revised in accordance with the suggestions and criticisms of the small group (Draft III). The eighth is operational field trial, piloting a guidebook for a large group of 30 students in the trial subject. The ninth. The final product, based on the results of the evaluation of the operational field trials, has become the final product that is feasible to be implemented. The tenth is Dissemination and implementation of products, disseminate manuals that have been created and disseminate them, which can be done through collaboration with publishers to publish products that have been made.

The development products that will be carried out in this research are up to the tenth stage of product dissemination and implementation, disseminating the guidebooks that have been
created and disseminating and disseminating them. The development procedure in this study can be presented in the form of images as follows:

**a. Techniques and Data Collection Instrument**

Data collection techniques in this study used questionnaires to assess the feasibility of guidebooks through material experts and media experts. Data collection techniques are the method chosen and used in research activities so that research can run systematically. The data collection in this study uses questionnaire data collection or a guidebook feasibility questionnaire through expert validation and the effectiveness of the guidebook questionnaire given to students in limited product trials.

**b. Data analysis technique**

The data analysis technique used in this guidebook development research is using quantitative data analysis. Quantitative data analysis was obtained by quantitative descriptive analysis, namely analyzing quantitative data obtained from expert validation and limited field trials and testing of Suharsimi's operational parameters [2]. In this study a questionnaire is used with the following formula:

\[
\text{Value} = \frac{\text{Obtained Score} \times 100}{\text{Total score}}
\]  

(1)

**3 Result and Discussion**

Development of a guide book for PKC-KO technical group guidance for third semester students of guidance and counseling has been developed. The process of completing the PKC-KO technical group guidance guide book is carried out in stages to produce communicative learning media products that are feasible to use. The production of this guidebook has been
through a series of expert validity and field trials of users, in addition expert validation and field trials are intended to obtain data as revision material.

The process of making this manual has been gradually revised in accordance with the advice given by material experts, media experts and data obtained from field trials in each stage. After conducting the main field trial and operational field trials and data analysis at each stage of the trial, the conclusion of this guidebook has become a very good final product to be used as a learning medium that can be used by students for guidance and counseling.

The excellent results obtained by this media service are based on the results of media expert validation, material experts, as well as the main field trial process and operational field trials. At the validation stage the media expert obtained a score of 78 so that the value of 97.5 in the category of very good, at the validation stage of material experts obtained a score of 85 so that the value 85 with the category very good. In the main field trial stage, based on the results of the questionnaire obtained the total score of 3729 so that the value of 93 is in the very good category. At the operational field trial stage, the score was 9376 so that the score of 93.76 was in the very good category.

![Score Chart of Expert Test Assessments and Field Trial](image)

*Fig. 2.* Score Chart of Expert Test Assessments and Field Trial

The results of the level of students’ understanding of the PKC-KO technical group guidance book are carried out after the operational field test. The assessment was carried out by using a questionnaire the level of effectiveness of the PKC-KO technical group guidebook which was held on Wednesday 30 August 2018 for the third semester students of guidance and counseling Unimed with a total of 30 students. the scores obtained 1017 so the value of 85.

### 4 Conclusion

It can be concluded that the results of research and development is a practice handbook book for PKC-KO technical group guidance for third semester students of Guidance and Counseling Department, Faculty of Education, State University of Medan. This handbook contains covers, preface, table of contents, instructions for use, introduction, material which each contains a format and blank format, closing, and bibliography. This guidebook is also equipped with pictures to help facilitate users in understanding the contents of guidebook material. The PKC-KO technical guidance group guide book for third semester students of guidance and counseling from the results of assessment by experts has been declared feasible to be used as learning media, and from the results of trials by users after going through initial
field trials, main field trials, and testing the operational field is included in the very good category.

**Suggestions**

Students get guidance on PKC-KO technical group guidance as reference for student reading. Because in the PKC-KO technical guidance group guide book there is information about the steps of each stage of group guidance along with the RPL format, reports, and evaluations so that there is no mistake in practicing group guidance independently.

Lecturers can use the PKC-KO technical group guidance book as a new innovation as lecture material and learning media for students. The PKC-KO technique group guidance manual as a learning media is expected to facilitate lecturers in providing lectures on group guidance practices.

The PKC-KO technical guidance group guidebook as a learning medium is the result of development which still has some limitations in the development process carried out, especially in the scope of the material and language used. The material in this manual mostly discusses the stages of PKC-KO technical group guidance, so the material suggested in the development of the next guidebook is group guidance using other techniques and group counseling material. Therefore, there needs to be further development so that the PKC-KO technical group guidance book which is the result of this development can be more varied in its material.

**References**


The Effect of Individual Counseling Cognitive Behavioral Therapy for Online Game Addiction on Student SMP Puteri Sion Medan

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Abstract. This study aimed to determine the effect of individual counseling cognitive behavioral therapy against online game addiction on junior high school students of Puteri Sion. Subjects in this study were four junior high students the daughter of Zion. The research is a quasi experimental with non equivalent control group design. Data collection techniques used is using the Wilcoxon test to see whether there is the influence of individual cognitive behavioral counseling against online game addiction research on the subject. Wilcoxon's test results at the level of pre-test score obtained in the experimental group was 69 while the post-test scores obtained an average of 124.5 and a pre-test in the control group gained an average score of 73 pre-test and post-test scores on average 77, means the influence of individual counseling is more significant cognitive behavioral therapy (124.5 > 77) or (80.4% > 5.4%). This means that the hypothesis is no significant effect of individual counseling service provision cognitive behavioral therapy against online game addiction in private junior high school students received the daughter of Zion.

Keywords: Individual counseling, cognitive behavioral therapy, online game addiction.

1 Introduction

In Indonesia, the biggest users of online games are teenagers. For teenagers Indonesia online games not uncommon, especially for young people in urban areas. It is alarming, teenagers who are still in school spend time playing online games, causing the decline of their learning achievement. Besides the game around. There are four effects that online gaming addiction on health, personality, education, family and community.

After knowing the impact of online game addiction, researchers feel there should be measures that can help students to reduce addicted to online games, one of them by giving them individual counseling cognitive behavioral therapy. Individual counseling is the process of assistance provided by an expert or a professional to individuals who are having problems in developing their own potential and to find solutions to the problems experienced by counselee together.

This individual counseling using cognitive behavioral therapy approach, which is a counseling approach that focuses on improving cognitive distorted (negative) and then change your thoughts and feelings in a positive direction and is expected to be followed by a change in behavior from negative to positive. So that cognitive behavioral therapy can help the counselee to align your thoughts, feelings and actions.
do the researchers have several techniques that are very helpful in providing counseling to students who are addicted to online games. The use of cognitive behavioral therapy aimed at reducing the duration of people playing online games. This is according to research by King & Delfabro 2010 [1] showing that CBT is an effective therapy in overcoming addiction to computer gaming in which there are rules about health, monitor the pattern of the game, change the behavioral habits and oppose thought to play intensive games. It is also in line with research conducted by Young in 2007 [1] showing that CBT can be applied to overcome addiction to games in which participants were given CBT is able to solve their own problems.

Wieland [2] provide recommendations to the nurse practitioner psychotherapist that some online gaming addiction treatment, including cognitive behavioral therapy (CBT). Cognitive behavioral therapy (CBT) is a treatment that is based on the idea that the mind determines feelings. With the above reasons, researchers used individual counseling cognitive behavioral therapy to prove the effectiveness of individual counseling cognitive behavioral therapy to reduce addiction to online games on the students.

According to Soetjipto [3] addicted to online games is the increased use of online game play and intense, giving rise to various problems. According to Griffiths [3] online gaming addiction is a chronic disease characterized by the destruction of control on the use of psychoactive materials or clinical behavior. Furthermore, according to Weinsten [2] online gaming addiction is characterized by the extent of excessive gaming gamer that can affect negatively the player of the game. It can be concluded that online gaming addiction is the behavior of someone who can not control themselves in playing online games that can cause behavioral changes in him and have a negative impact on the gamer.

According Lemmens [2] there are seven characteristics of measurement to determine whether or not someone's opium gamers. If there are four characteristics exist in a person, it can be categorized as addicts' game: 1) Salience. Thinking of playing online games all day, without disturbing; 2) Tolerance. Spending time playing online games and do not realize how much time is spent playing games online; 3) Mood modification. Forgetting other activities and do not care about their impact; 4) Relapse. A trend playing online games back after a long absence to play for some reasons; 5) Withdrawal. Feel good or feel something is missing if you do not play online games; 6) Conflict. Fought with others because of excessive play games online, and; 7) Problems.

While the approach of cognitive behavioristik therapy according [4] and Kazdin [5] is as an approach to counseling that is designed to solve the problems of the counselee to perform cognitive restructuring and behavior that deviates by changing the mind, interpretation, conjecture and strategy in response.

Based on the understanding of cognitive behavioral therapy, according to experts, it can be concluded that cognitive behavior therapy is a counseling approach that focuses on improving cognitive distorted (negative) and then change your thoughts and feelings towards the positive and is expected to be followed by changing behavior from negative to positive, so with cognitive behavioral therapy can help the counselee to align your thoughts, feelings and actions (Wilding and Milne, 2013: 16 and Spiegler&Guevremont, in [1].

Objective cognitive behavior theraphy according Oemarjoed [4] is to invite counselees against wrong thoughts and emotions by presenting evidence contrary to their beliefs about the problems encountered. The counselor should be able to help the counselee to find in nature dogmatic belief in yourself strongly counselees and try to minimize it. According [5] the purpose of cognitive behavioral therapy is to maintain an efficient behavior by strengthening the function of cognitive skills to create change.
Based on the goal of cognitive behavioral therapy in the above, it can be concluded that the goal of cognitive behavioral therapy is to encourage people to learn to change behavior, calm the mind so that you feel better, think more clearly and can make the right decisions. But in the process of implementing this therapy, counseling, cognitive behavioral therapy should be tailored to the characteristics or counselee problems, of course, the counselor must understand the underlying principles of cognitive behavioral therapy as disclosed by Beck (Munthe, 2014: 15).

The technique used in cognitive behavioral therapy counseling is self-control technique consists of recording yourself, self-evaluation and self-affirmation. Inauguration of a positive self will help counselees transform itself into a more positive picture, and will ultimately increase the confidence and the ability to escape from online gaming addiction by observing the following stages stages.

<table>
<thead>
<tr>
<th>No.</th>
<th>Process</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Assessment and Diagnosis</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Finding the root cause is sourced from negative emotions, departures thinking process, and core beliefs that relate to problems counselee</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Counselors together counselee intervention plan by providing positive and negative consequences to the counselee</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>Reorganizing the deviant beliefs</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>Behavioral interventions</td>
<td>5</td>
</tr>
<tr>
<td>6.</td>
<td>Prevention and self-help training</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: [6]

2 Methodology

This study uses a quantitative approach with quasi experimental research methods that have a control group. Quasi-experimental design used in this study was nonequivalent control group.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-test</th>
<th>Treatment</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>The experimental group</td>
<td>O1</td>
<td>X1</td>
<td>O2</td>
</tr>
<tr>
<td>The control group</td>
<td>O3</td>
<td>-</td>
<td>O4</td>
</tr>
</tbody>
</table>

Source: [8]

To obtain accurate data, this research uses collection techniques data using questionnaires and observation sheets to observe the effect of individual counseling to students who are addicted to online games.

Before the questionnaire given to counselee first tested the validity and reliability of measuring instruments, by using data analysis techniques Product Moment [8]. As for the reliability test, formula used in this study is in the alpha formula[8]. Based on calculations using Alpha formula, it is known r11 = 1.085 with correlation index in the high category. Analysis engineering data used is the Wilcoxon test, a test of the parties' rank test "- marked Wilcoxon" proposed by Siegel and Jr. [9] due to the small sample berkuran researchers.
3 Result and Discussion

Based on the results obtained, the average of data lower than the pre-test post-test data in the experimental group, namely (69 <124.5), while the control group (73 <77). So, there is an average addicted to online games on the students (See Table 3).

<table>
<thead>
<tr>
<th>Group</th>
<th>No</th>
<th>Respondents</th>
<th>Score Pre-Test</th>
<th>Post-Test Scores</th>
<th>Difference</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>JO</td>
<td>68</td>
<td>115</td>
<td>47</td>
<td>28.63</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>IR</td>
<td>70</td>
<td>134</td>
<td>64</td>
<td>33.36</td>
</tr>
<tr>
<td>Total Value</td>
<td></td>
<td></td>
<td>138</td>
<td>249</td>
<td>111</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td>69</td>
<td>124.5</td>
<td>55.5</td>
<td></td>
</tr>
<tr>
<td>The highest score</td>
<td></td>
<td>70</td>
<td>115</td>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lowest Rated</td>
<td></td>
<td>68</td>
<td>134</td>
<td>66</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to the table above is known difference in scores obtained by each student. The following is a description of an increase in change online game addiction:

a. The rate of change JO addicted to online games have the pre-test (before given individual cognitive behavioral counseling services).

b. The rate of change IR addicted to online games have the pre-test (before given individual cognitive behavioral counseling services) amounted to 70 categories of low, thereby changing IR addicted to online games by 64 or 33.36% in the experimental group.

c. The rate of change PR addicted to online games have the pre-test (before given individual counseling services) by 72 categories of low, thereby changing PR addicted to online games by 6 or 12.01% in the control group.

d. The rate of change EB addicted to online games have the pre-test (before given individual counseling services) of 74 categories of low, thereby changing PR addicted to online games by 2 or 11.70% in the control group.

Based on the above it can be seen an increase in online gaming addiction changes before and after treatment in the experimental group and the control group. Before the service given in the experimental group there is an average score of online game addiction behavior change in the experimental group was given 69 and after treatment change interval increase in online gaming addiction behaviors in the experimental group 55.5% and the average score change behavior online gaming addiction the control group was 73 and after a given treatment interval changes increase online gaming addiction behaviors in the control group 8%.

Hypothesis testing is done by calculating the level marked Wilcoxon test at the Wilcoxon test result the number of levels of calculating the number of levels is positive = 10 and the number of levels is negative = 0, so the value of J = 0, ie a smaller number of levels.

A table of critical values for the test marked level Wilcoxon for n = 2, α = 0.05 bidirectional testing J0,05 (0) H0 is rejected. This means that changes in the behavior of online gaming addiction before and after treatment in the experimental group and the change in the control group is not the same, in this case the students who have been given preferential treatment in the experimental group had a higher score or a significant change from the change in the control group.
Table 4. Results Comparison of Pre-Test and Post-test Online Game Addiction Changes In Control Group

<table>
<thead>
<tr>
<th>No</th>
<th>Respondents</th>
<th>Score Pre-Test</th>
<th>Post-Test Scores</th>
<th>Difference</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PR</td>
<td>72</td>
<td>78</td>
<td>6</td>
<td>12.01</td>
</tr>
<tr>
<td>2</td>
<td>EB</td>
<td>74</td>
<td>76</td>
<td>2</td>
<td>11.70</td>
</tr>
<tr>
<td>Total Value</td>
<td>146</td>
<td>154</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>73</td>
<td>77</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The highest score</td>
<td>74</td>
<td>78</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lowest Rated</td>
<td>72</td>
<td>76</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Testing the hypothesis above, further reinforced by the equation calculation formula, the number of levels terkecilah used, while equation is used for foundation testing value Z. 

H0 is rejected if z count < z table. Since the z score -1.35 and the count is smaller than the z value table is -1.96, value -1.96 obtained from the value Za / 2 value of table Z 0.05 / 2 = Z0.025 = -1.96. Thus, H0 is rejected, which means the effect of treatment in the experimental group is more significant than the change in treatment in the control group, which means individual counseling cognitive behavioral therapy is more efficient and gives effect to the online gaming addiction in students.

4 Conclusion

Based on the results of this study concluded that the implementation of individual counseling cognitive behavioral therapy in the experimental group had a more significant effect on the online gaming addiction in class VIII SMP Puterisio Medan. Results of the calculations in the experimental group obtained Jhitung = 4. With α = 0.05 and n = 4, then based on the list, Itabel = 0. From these data it appears that J count>Jtabel = (4> 0), before being given treatment or pre-test in the experimental group gained an average score of 69 online gaming addiction and post-test scores obtained an average of 124.5 addicted to online games and test pre-test in the control group gained an average of 73 online gaming addiction behavior and post-test gained an average of 77 online gaming addiction behavior. Then the behavior of students addicted to online games after being given the treatment in the experimental group was higher than the changes experienced by the control group after treatment (124.5> 77) or 80.4%> 5.4%. Hipotsis then H0 is rejected, this is reinforced by the equation of formula Z. Because Z count value is -1.35 and it was smaller than the z value table is -1.96.

References

Bibliometric Study of Students’s Thesis of Early Childhood Education Teacher Education Program

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Abstract. This study aims to map students' thesis on Early Childhood Education Teacher Education Program (PG PAUD) UNIMED FIP from 2011 to 2015. This type of research is quantitative research with a bibliometric approach. The object of the research is in the form of a thesis for undergraduate students of teacher education programs for early childhood education (PG-PAUD). Data processing methods are carried out through stages (1) data collection, conducted by focusing on aspects of research topics, research subjects, types and methods of research, analysis techniques and references (2) data entry; (3) data analysis; (4) make tabulations according to observation requirements; and (5) descriptive interpretation. The results show that the topic of the most independent variables that appear most frequently in student theses over the past 5 years is the topic of play, which is as much as 32%. The topic of the free variables used so far varies greatly. Cognitive abilities and interpersonal abilities become topics of dependent variables that often appear, but are still in a small category. The topic of the independent and dependent variables for PG-PAUD research is still much that needs to be studied and studied further. The type of research that dominates the PG-PAUD FIP UNIMED thesis during the last five years is Classroom Action Research (CAR) and experiments, each of which appears as much as 44.9%. Other types of research have not been widely carried out. The research subjects used in PG-PAUD students' thesis almost all (80.8%) are children aged 5-6 years (group B), while children aged 4-5 years (group A), PAUD teachers, parents who having early childhood and first grade elementary school students is only a small part of the subject of PG-PAUD thesis research.

Keywords: Bibliometrics, thesis, PG-PAUD, research topic, type of research, subject of research

1 Introduction

Education in college aims to prepare students to become members of the community who have academic and professional abilities. Every college has special provisions and requirements that must be taken for student graduation. One of these conditions is that students are required to write a final assignment.

The final assignment of students that must be written in taking the level of education is the thesis writing. Thesis is a kind of scientific essay that describes an important subject in a branch of science as a result of literature and / or field research conducted by a student based on academic assignments from his college [1]. The thesis is prepared based on a student's research and is intended as a final proof of the quality of his scientific thinking, his ability to integrate all the knowledge that has been learned during his study, especially to solve a
problem scientifically or as an effort of every student at the end of his studies to make a real
to the progress of science cared for by his faculty[2].

Ideally the thesis must be able to answer the existing problems in accordance with the
development of the field of science studies. The studies that have been carried out can become
a foothold for the development of further research. The conditions in the Medan State
University FIP especially the Early Childhood Education Teacher Education Program (PG
PAUD), students are less aware of the direction of the research to be conducted. Most students
only see the existing thesis examples without seeing the problems and conditions in the
environment according to their scientific fields.

This is in accordance with Januarti's (2009) study that the constraints that are commonly
faced by students in writing thesis are the constraints of determining the title or problem that
exists. [2] also identified some of the problems of students in compiling a thesis, one of which
is the title of the thesis, mostly not the result of identification of learning problems in school,
but reading the thesis before.

The unclear mapping of the thesis written by PG PAUD students makes it difficult for
future researchers to determine the research and planning that must be done. In addition, it can
cause repetition of problems to be examined, so that the next impact is the results of student
research written in the thesis does not indicate the existence of scientific progress in the field
of teacher education for early childhood education.

Mapping of a good thesis should reflect the research activities that have been carried out,
so that it can provide further research predictions. Therefore, it is very important to do a thesis
bibliometric study of students of Early Childhood Education Teacher Education (PG PAUD)
to map the extent of the problems, methods and subjects of research that have been conducted
in order to build a research mapping of PG PAUD, FIP, Medan State University, so it is
expected to reduce repetition the problems studied and can develop the field of PG-PAUD
studies.

2 Methodology

his type of research is quantitative research with documentation survey method or known
as bibliometrics. The research subjects were undergraduate thesis students of teacher
education programs for early childhood education (PG-PAUD). Data collection methods are
carried out by means of documentation through inspection and recording. The research
procedure adapts [3] bibliometric study method, namely (1) data collection; (2) data entry; (3)
data analysis; (4) make tabulations according to observation requirements; and (5) descriptive
interpretation.

In this study the data was taken not from the entire population of the 2011-2015 PG-
PAUD student thesis, but only the PG-PAUD thesis was taken from 2011-2015. Thesis
samples used in this study amounted to 78 theses of PG-PAUD students in the last five years.

The data in this study are information in the thesis covering research topics, research
subjects, types and methods of research, and data analysis techniques. The data comes from
the thesis of students of the Early Childhood Education Teacher Education program (PG-
PAUD). The data processing is carried out through stages: (1) data collection, conducted by
focusing on aspects of research topics, research subjects, types and methods of research, and
data analysis techniques; (2) data entry; (3) data analysis; (4) make tabulations according to
observation requirements; and (5) descriptive interpretation.
3 Result and Discussion

Based on the thesis data collection of PG PAUD FIP UNIMED students from 2011-2015 a sample of 78 theses was obtained. Table 1 shows the distribution of the topic of the independent variables that appeared in the PG PAUD FIP UNIMED thesis during the last five years (2011-2015).

<table>
<thead>
<tr>
<th>No</th>
<th>Independent Variables Topic</th>
<th>Frequency</th>
<th>%</th>
<th>Categorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Play</td>
<td>25</td>
<td>32%</td>
<td>Almost half</td>
</tr>
<tr>
<td>2</td>
<td>Story Telling</td>
<td>7</td>
<td>9%</td>
<td>In part</td>
</tr>
<tr>
<td>3</td>
<td>Use of Media (Images, Cards, Audio Visual, Manipulative, story books)</td>
<td>6</td>
<td>7.7%</td>
<td>In part</td>
</tr>
<tr>
<td>4</td>
<td>Dancing, Music, Motion</td>
<td>6</td>
<td>5.4%</td>
<td>In part</td>
</tr>
<tr>
<td>5</td>
<td>Learning model</td>
<td>6</td>
<td>5.4%</td>
<td>In part</td>
</tr>
<tr>
<td>6</td>
<td>Drawing Activities</td>
<td>3</td>
<td>3.8%</td>
<td>In part</td>
</tr>
<tr>
<td>7</td>
<td>Role of Parents / Parenting</td>
<td>3</td>
<td>3.8%</td>
<td>In part</td>
</tr>
<tr>
<td>8</td>
<td>Demonstration Method</td>
<td>3</td>
<td>3.8%</td>
<td>In part</td>
</tr>
<tr>
<td>9</td>
<td>Conversation Method</td>
<td>3</td>
<td>3.8%</td>
<td>In part</td>
</tr>
<tr>
<td>10</td>
<td>Teacher Professional Allowance</td>
<td>3</td>
<td>3.8%</td>
<td>In part</td>
</tr>
<tr>
<td>11</td>
<td>Others (Motivation, Reward, Leadership Style, Jarimatika Technique, Experimental Method, Batik, etc.)</td>
<td>12</td>
<td>15%</td>
<td>In part</td>
</tr>
</tbody>
</table>

Based on Table 1, it can be seen that the topic of play has become the most frequent topic in the thesis of the students of PG PAUD FIM UNIMED for the last five years (2011-2015), namely as much as 32% or almost half, followed by the topic of storytelling or storytelling reaching 9%, usage media both image, card, audio visual media, manipulative media and story books as much as 7.7%, dancing, music and motion as much as 5.4%, learning models (contextual models, make a match, number head together) of 5.4%. Another group on the topic of independent variables as much as 15% showed the There are no independent variable topics that dominate the thesis study of PG-PAUD students, although the topic of play appears as much as 32% or almost half, but it cannot be said to dominate because in categorization it is still less than half. The topic of the independent variables used in the thesis of PG-PAUD students varies. The creative world of PG-PAUD makes PG-PAUD variability of the topic of the independent variables used in the thesis study of PG PAUD UNIMED students during 2011-2015.

students kratif in determining the topic of independent variables in thesis research, as the final project of PG-PAUD students. This also shows that the topic of independent variables from existing PG-PAUD studies still needs to be studied and studied further.

Next the topic of the dependent variable that appears in the PG PAUD FIM UNIMED thesis for the last two three years (2011-2015) is shown in table 2.

<table>
<thead>
<tr>
<th>No</th>
<th>Dependent Variables Topic</th>
<th>Frequency</th>
<th>%</th>
<th>Categorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kemampuan Kognitif</td>
<td>9</td>
<td>11.5%</td>
<td>In part</td>
</tr>
<tr>
<td>2</td>
<td>Kemampuan Interpersonal</td>
<td>9</td>
<td>11.5%</td>
<td>In part</td>
</tr>
<tr>
<td>3</td>
<td>Kreativitas</td>
<td>7</td>
<td>9%</td>
<td>In part</td>
</tr>
</tbody>
</table>
Based on Table 2, it can be seen that the topic of cognitive abilities and interpersonal abilities is the topic of bound variables that most often appears in the thesis of PG PAUD FIP UNIMED students for the last five years (2011-2015), which is as much as 11.5%, followed by the topic of creativity reaching 9%, social behavior and spatial visual intelligence appear as much as 7.7%, gross motor and fine motoric become the topic of dependent variables that appear as much as 6.4%, speech ability appears as much as 5%, emotional intelligence and number recognition appear as much as 3.8%, language skills, children's vocabulary, reading ability and kinesthetic intelligence of munuc were 2.7%. The other groups on the topic of bound variables as much as 12.8% show the variability of the topic of the dependent variable used in the thesis study of the PG PAUD UNIMED students during 2011-2015. Table 2 above shows the variable bound variable is more varied than the topic of the independent variables that appear in the thesis of PG PAUD 2011-2015 students.

As with the topic of independent variables, none of the topics of the dependent variable dominated the thesis study of PG-PAUD students. All the topics of the dependent variable that appear are in a minority categorization, meaning that the topics of the dependent variable that appear in the PG-PAUD thesis in the last five years can still and need to be studied and studied further. The world of PG-PAUD that is full of creativity makes the topic of the dependent variable appear to be varied.

The distribution of research methods used in the PG PAUD FIP UNIMED thesis during the last five years (2011-2015) is shown in Table 3.

<table>
<thead>
<tr>
<th>No</th>
<th>Dependent Variables Topic</th>
<th>Frequency</th>
<th>%</th>
<th>Categorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perilaku Sosial</td>
<td>6</td>
<td>7.7%</td>
<td>In part</td>
</tr>
<tr>
<td>2</td>
<td>Kecerdasan visual spasial</td>
<td>6</td>
<td>7.7%</td>
<td>In part</td>
</tr>
<tr>
<td>3</td>
<td>Motorik Kasar</td>
<td>5</td>
<td>6.4%</td>
<td>In part</td>
</tr>
<tr>
<td>4</td>
<td>Motorik Halus</td>
<td>5</td>
<td>6.4%</td>
<td>In part</td>
</tr>
<tr>
<td>5</td>
<td>Kemampuan bicara</td>
<td>4</td>
<td>5%</td>
<td>In part</td>
</tr>
<tr>
<td>6</td>
<td>Kecerdasan emosi</td>
<td>3</td>
<td>3.8%</td>
<td>In part</td>
</tr>
<tr>
<td>7</td>
<td>Pengenalan lambang bilangan</td>
<td>3</td>
<td>3.8%</td>
<td>In part</td>
</tr>
<tr>
<td>8</td>
<td>Kinerja Guru</td>
<td>3</td>
<td>3.8%</td>
<td>In part</td>
</tr>
<tr>
<td>9</td>
<td>Kemampuan bahasa</td>
<td>2</td>
<td>2.7%</td>
<td>In part</td>
</tr>
<tr>
<td>10</td>
<td>Kosakata Anak</td>
<td>2</td>
<td>2.7%</td>
<td>In part</td>
</tr>
<tr>
<td>11</td>
<td>Kemampuan Membaca</td>
<td>2</td>
<td>2.7%</td>
<td>In part</td>
</tr>
<tr>
<td>12</td>
<td>Kecerdasan Kinestetik</td>
<td>2</td>
<td>2.7%</td>
<td>In part</td>
</tr>
<tr>
<td>13</td>
<td>Lain-lain (Moral Anak, Kemanduan Menyimak, Kemampuan menulis, motivasi guru, motivasi anak, kemampuan pemecahan masalah matematika, penyelenggaraan PAUD, kemampuan sains, kemampuan musikal, berhitung)</td>
<td>10</td>
<td>12.8%</td>
<td>In part</td>
</tr>
</tbody>
</table>

Table 3. Types of Research in the Thesis of PG-PAUD Students in 2011-2015

<table>
<thead>
<tr>
<th>No</th>
<th>Types of Research</th>
<th>Frequenty</th>
<th>%</th>
<th>Categorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Classroom action research</td>
<td>35</td>
<td>44.9%</td>
<td>Almost half</td>
</tr>
<tr>
<td>2</td>
<td>Experiment</td>
<td>35</td>
<td>44.9%</td>
<td>Almost half</td>
</tr>
<tr>
<td>3</td>
<td>Comparative</td>
<td>4</td>
<td>5.1%</td>
<td>In part</td>
</tr>
</tbody>
</table>
Based on Table 3 it can be seen that the type of research that is often used by students in the work of the UNIMED FIP PG PAUD thesis over the last five years (2011-2015) is PTK and experiments, which is as much as 44.9% or almost half of the existing research. Other types of research such as comparative, correlation, and descriptive have not been done much. This is important information that needs to be followed up, for example by motivating students to conduct descriptive, choreal, or comparative research. [4] states that educational research in accordance with its characteristics can take the form of descriptive, analytical, explorative, experimental, case studies, historical, and comparative studies.

The research subjects used in the PG PAUD FIP UNIMED thesis during the last five years (2011-2015) are shown in Table 4.

Table 4. Research Subjects in Student Thesis in 2011-2015

<table>
<thead>
<tr>
<th>No</th>
<th>Research Subjects</th>
<th>Frequency</th>
<th>%</th>
<th>Categorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Children aged 5-6 years (Group B)</td>
<td>63</td>
<td>80.8%</td>
<td>Almost all</td>
</tr>
<tr>
<td>2</td>
<td>Children aged 4-5 years (Group A)</td>
<td>9</td>
<td>11.5%</td>
<td>In part</td>
</tr>
<tr>
<td>3</td>
<td>Teacher of Early Childhood</td>
<td>4</td>
<td>5.1%</td>
<td>In part</td>
</tr>
<tr>
<td>4</td>
<td>Parents Who Have Early Childhood</td>
<td>1</td>
<td>1.2%</td>
<td>In part</td>
</tr>
<tr>
<td>5</td>
<td>Grade 1 elementary school students</td>
<td>1</td>
<td>1.2%</td>
<td>In part</td>
</tr>
</tbody>
</table>

Based on Table 4 it can be seen that almost all of the research subjects were used by students in the work of the UNIMED FIP PG PAUD thesis for the last five years (2011-2015) were children aged 5-6 years (group B), as many as 80.8%, while children aged 4-5 years (group A), PAUD teachers, parents who have early childhood and first grade elementary school students are only a small part of the subject of PG-PAUD thesis research. This is an important information that needs to be followed up, namely by motivating students to conduct research with the subjects of the study are children aged 4-5 years (Group A), PAUD teachers, parents who have early childhood, and first-class students SD, all of which are still related to the scope of PG-PAUD.

4 Conclusion

The results show that the topic of the most independent variables that appear most frequently in student theses over the past 5 years is the topic of play, which is as much as 32%. The topic of the free variables used so far varies greatly. Cognitive abilities and interpersonal abilities become topics of dependent variables that often appear, but are still in a small category. The topic of independent and dependent variables for PG-PAUD research is still much that needs to be studied and studied further. The type of research that dominates the PG-PAUD FIP UNIMED thesis during the last five years is Classroom Action Research (CAR) and experiments, each of which appears as much as 44.9%. Other types of research have not been widely carried out. The research subjects used in PG-PAUD students' thesis almost all (80.8%) are children aged 5-6 years (group B), while children aged 4-5 years (group A),
PAUD teachers, parents who having early childhood and first grade elementary school students is only a small part of the subject of PG-PAUD thesis research.

This mapping can be used as a guideline for the management of the thesis in the PG-PAUD study program in order to be able to direct student thesis research so as to produce thesis research that can provide a large contribution to the progress of science in the field of PG-PAUD.

Academic supervisors and thesis advisers should know the mapping of thesis research and direct students to realize the proportionalisation of student thesis research, to avoid repeated research without creativity. This mapping, allows for further research in more detail and depth, according to a certain period of time.

References


The Instructional Development of Reading Material Based on Literacy with Local Culture in Indonesian Learning

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Abstract. This study aimed to find out: (1) the process of developing literacy-based reading material with local wisdom in Indonesian language learning (2) the feasibility of literacy-based reading materials containing local wisdom in Indonesian language learning and (3) the effectiveness of charged literacy-based reading materials local wisdom in learning Indonesian. The subject of this study was three validation experts, and the fourth-grade students of State Elementary School (SD Negeri 014727 of Perupuk) consisted of 24 students. This research was a development research using the ADDIE development model. The results of this study indicate that (1) the process of developing reading teaching materials includes 5 steps, namely: analysis, design, development, implementation, evaluation, (2) reading-based teaching materials local wisdom literacy was feasible to use, (3) reading teaching materials based on local wisdom-charged literacy were effectively used.

Keywords: Instructional material, reading, literacy based, local culture

1 Introduction

The Teachers and Lecturers Law Number 14 of 2005 Article 8 stated that teachers must have academic qualifications, competencies, educator certification, physically and mentally healthy, and have the ability to realize national education goals. Teacher competencies as referred to in the law included pedagogic competence, personality competence, social competence and professional competence. These core competencies as well as these obligations teachers or lecturers were required to be able to develop innovative teaching materials (can be in the form of printed teaching materials, models / models, audio teaching materials, audiovisual teaching materials, or interactive teaching materials in accordance with development curricula the needs of students, as well as the development of information technology.

Teaching materials became one of the learning tools that were arranged systematically and have an important role in the learning process, namely as a reference for educators and increasing the effectiveness of student learning. Well-selected teaching materials will foster students’ interest in mastering the material given. The choice of learning material must be fundamental to the goal. Materials were only considered taken if they have relevance to the desired competencies. By linking teaching materials with practical life situations can bring up the meaning of the teaching material for the students themselves [1]. The choice of learning
material must be felt that the teaching material was meaningful or meaningful, so that the feeling of wanting to know or want to emerge.

The previous studies conducted by researchers at SD Negeri 014727 Perupuk revealed that the teaching materials used by teachers were conventional teaching materials, namely teaching materials obtained from book distributors who often came to school and were not independently developed. The textbooks used have not touched the potential, resources and local wisdom in Batubara area, so this has an impact on the irrelevance of the material presented with the learning objectives to be achieved. Besides that the environmental sub-textbook where I live that students use was not in accordance with the environment where students live. Thus, the risk that was very possible was the teaching material used was not contextual, less attractive and less suitable to the needs of students. Education today must have interesting, effective and efficient learning. Therefore, teaching materials that were innovative, varied, interesting, contextual and appropriate to the level of student needs were needed.

The same thing was also conveyed by [2] the factors that became the problem for teachers were teachers needing teaching materials that contained material that was suitable with the environment where students live. Students’ books provided by the government, the scope of the material was still broad, not in accordance with the environmental conditions where students live. The teachers realized that the material in the students’ book, especially the sub-theme "My Environment" was not yet in accordance with the environmental conditions where the students live, but there was not enough time to develop teaching materials in this sub-theme.

Literacy test reading in PISA (The Program for International Student Assessment) showed the results of the survey; that reading competence has not shown a significant increase from 396 in 2012 to 397 points in 2015 (Kemendikbud, 2016). Therefore, the Ministry of Education and Culture developed a school literacy movement (GLS) that involved all stakeholders in the education sector, starting from the central, provincial, district/city level, to the education unit. In addition, the involvement of external elements and public elements, namely parents of students, alumni, society, business and industry was also an important component in GLS. This school literacy movement carries out 15 minutes of reading activities before the lesson begins. Books that were read were non-textbook lessons that contain local wisdom.

In fact, the school literacy movement has not been carried out in the District of Limapuluh Unit V at Elementary School (SD) Limapuluh-unit V. This was based on the results of interviews of eight school principals in unit V elementary school in Limapuluh sub-district, Batubara district consisting of SD Negeri 014726 Pematang Panjang, SD Negeri 014724 Guntung, SD Negeri 010206 Pematang Panjang, SD Negeri 015880 Perupuk, SD Negeri 010210 Perupuk, SD Negeri 010719 Gambus Laut, SD Negeri 015883 Guntung, and SD Negeri 014727 Perupuk revealed that GLS was not implemented in these schools.

The above statement was also supported by the results of interviews of researchers with 15 teachers in SD Negeri 014727 Perupuk, revealing that the factor in the implementation of the school literacy movement in the elementary school was; (1) The GLS program was not listed as a school program, (2) lack of reading interest of students and teachers, (2) lack of local wisdom-based reading material, (3) lack of optimal library management, (4) large number of teacher assignments in preparing learning in class.

Responding to the problem, researchers were encouraged to develop reading teaching materials based on local wisdom load literacy. Learning Indonesian material in elementary schools cannot be separated from cultural values. This will support the development of students' reading skills through the media of local wisdom in student residence. This study was
designed to produce reading material based on decent and effective literacy charged with local wisdom used by students in the learning process.

2 Methodology

2.2. Reading Materials

Teaching materials were all forms of material used to help teachers / instructors in carrying out teaching and learning activities [3]. Therefore, with teaching materials, learning programs can be implemented more regularly because the teacher gets clear material guidelines.

According to [4] teaching materials were all forms of material or material that was systematically arranged which was used to help teachers or instructors in carrying out teaching and learning activities so as to create an environment that enables students to learn. This showed that teaching materials have a strategic function for the learning process that can help teachers and students in learning activities, so that the teacher did not present too much material. Teaching materials were materials or subject matter arranged systematically, which are used by teachers and students in the learning process. Thus, teaching materials or learning materials consisted of knowledge, skills, and attitudes that students must learn in order to achieve specified competency standards.

Reading was one of the most important language skills. Reading was an interactive activity to understand the meaning or meaning contained in written material [5]. Besides that, reading was also a process that is carried out and used by the reader to get the message to be conveyed by the author through the medium of words / written material. According to [6] reading was a complex activity that involved various factors that come from within the reader and outside factors. Reading was a type of human ability as a product of learning from the environment. Therefore, the reading process was done by an adult (can read) was an effort to process and produce something through the use of certain capital.

Reading was an activity carried out to obtain information from written material. Reading was a process that was carried out and used by the reader to get the message to be conveyed by the author through the medium of words / written language. So that the reading process was carried out properly, the meaning and message that will be conveyed by the author will be captured and understood by students well. Thus, if someone after reading activity can take a message from the reading then the process is said to be successful. Likewise, vice versa if someone after reading activities but has not been able to take the message conveyed by the author then the process has not been successful.

According to [7] reading learning can be interpreted as a series of activities carried out by students to achieve reading skills. There were three main objectives of reading learning at school. The three main objectives were (1) allowing students to be able to enjoy reading activities, (2) being able to read silently with flexible reading speed, (3) and obtaining a sufficient level of understanding of the contents of the reading. The reading learning process consists of three stages. The stages were (1) pre-reading activities, (2) reading activities, (3) post-reading activities. Pre-reading activities were activities carried out before students carry out reading activities. Activities carried out by teachers and students at the pre-reading stage were asking a number of questions about the topic, then students answer the question by connecting the background of the experience they have.

Implementation of activities at the stage of reading using skimming techniques, namely students were required to read silently and then understand the topic of reading, the ability to
identify people's opinions, the ability to conclude reading material. The post-reading stage was the activity of stabilizing the learning outcomes obtained previously. Post-reading activities were used to help students integrate the new information they read into the scheme so that a higher level of understanding was obtained.

2.3. Literacy Based Learning

The definition of school literacy in the context of the school literacy movement (GLS) was the ability to access, understand, and use something intelligently through various activities, including reading, seeing, listening, writing, and/or speaking (Kemendikbud, 2016).

According to Wray (2004), based learning literacy was intended that the students were able to achieve competence (1) believers were themselves, smoothly, and understanding in reading and writing, (2) interesting on the books, enjoy reading, evaluating, and assess readings were read, (3) knowing and understand the various genres of fiction and poetry, (4) understanding and become familiar with the basic structure of the narrative, (5) understanding and use different texts of nonfiction, (6) able to use various manual read (phonics, graphic, syntactic, and context) to monitor and correct the reading activities independently, (7) planning, draft, revise and edit writing independently, (8) having interest in the words and meaning, as well as actively develop vocabulary, (9) understanding sound and spelling system, as well as using it to spell and read accurately, (10) fluently and used to write longhand.

Based on the above learning, literacy-based learning was simply intended to develop three main competencies, namely competence at the word level, sentence level, and text level. Competence at the word level includes spelling and vocabulary; at the sentence level includes punctuation and grammar, and at the text level it includes understanding the text and composition of the text.

At the lower level, literacy learning aimed to introduce children to the basics of reading and writing, maintaining language awareness, and motivating learning. Literacy learning at the secondary school level aims to read students jumping far ahead. Students were involved with various texts and technologies that would help develop them as active, critical, responsible and creative communicators for the 21st century. Students were invited to explore various texts and new ways to understand these texts. Throughout learning, students were required to always develop and perfect their abilities in creating various types of texts, through the use of various technologies and contexts properly. Literacy tools that can be used by students include school libraries, class reading corners, and reading areas. Based on the implementation stage of the school literacy movement, Kemendikbud (2016) shared literacy skills as follows:

a. The habituation stage: (1) articulates empathy for the character of the story, (2) separates facts and fiction, (3) presents the story effectively, (4) knows the type of writing in the media and its purpose.

b. The development stage: (1) listens to stories to grow empathy, (2) spells out sentences and understands simple stories, (3) reads stories (4) answers questions about characters, stories and events in stories, (5) tells stories through pictures or simple words / sentences, (6) identify the main characters and simple storylines, (7) understand fantasy stories and folktales in specific cultural contexts, (8) identify elements of facts and fiction in stories.

c. Learning phase: literacy activities at this stage improve receptive (reading and listening) and active (speaking and writing) language skills which are explained in detail in the context of the two main activities at this stage, namely reading and writing. The ability to read and write is translated so that the improvement of skills in the four areas of the
language (reading, listening, speaking, and writing) can be done in a measurable and sustainable manner.

2.4. Local Wisdom of Batubara Malay Ethnic

Local wisdom consisted of two words, namely wisdom and local. According to [8] local wisdom were ideas or values, local views (local) that are wise, full of wisdom, good value that are embedded and followed by members of the community. Local wisdom was the wisdom and original knowledge of a society that comes from the noble values of cultural traditions to regulate the order of life of the community wisely or wisely. Local wisdom can be interpreted as good cultural values in a society. This means, to know a local wisdom in a region, we must be able to understand the good cultural values that exist within the region.

According to [9] there were five dimensions of local wisdom, namely; (1) local knowledge, (2) local culture, (3) local skills, (4) local sources, (5) local social processes. Wagiran (2012) also explained that the scope of local wisdom includes aspects: (1) traditional ceremonies, (2) cultural heritage, (3) natural tourism, (4) traditional transportation, (5) traditional games, (6) cultural infrastructure, (7) traditional clothing, (8) cultural heritage, (9) museums, (10) cultural institutions, (11) arts, (12) cultural villages, (13) arts and crafts, (14) folklore, (15) children games (16) puppets.

According to [10] types of local wisdom, among others (1) welfare, (2) hard work, (3) discipline, (4) education, (5) health, (6) mutual cooperation, (7) management gender, (8) preservation and cultural creativity, (9) caring for the environment, (10) peace, (11) politeness, (12) honesty, (13) social solidarity, (14) harmony and conflict resolution, (15) commitment, (16) positive thoughts, and (17) gratitude.

Batubara Ethnic Malay as a local ethnic of Batubara Regency has cultural customs that are rich in a variety of wisdom that is their characteristic. As a cultured society, they remain firm in maintaining and carrying out this wisdom. The local wisdom of the Malay Coal community is; (1) bergito rituals, (2) culture of dedication and service, (3) advice on harmonization of harmonization developers, (4) wisdom in Malay leadership, (5) wisdom in resolving conflicts through raw arbor and fresh flour [11]. Besides that the scope of the local wisdom of other Malay Batubara communities was; (1) folklore of the origin of the Batubara city and the origin of tador sea, (2) Limalaras palace cultural heritage, (3) island natural tourism, and (4) cultural heritage such as tapai party.

This type of research was development research. This study referred to the ADDIE development model. This research was conducted at SD Negeri 014727 Perupuk District of Limapuluh Batubara Regency. This research was carried out in stages starting from March 24, 2018 to May 24, 2018. The subjects of this study were grade IV students of SD Negeri 014727 Perupuk for the 2017/2018 Academic Year, which amounted to 20 students and validators team of 3 people. The object of this research was a book that was developed to be tested for grade IV students of SD Negeri 014727 Perupuk and tested with validator experts.

The instrument of data collection in this study used an expert validation questionnaire sheet and reading skills assessment sheet. The data analysis of this study on the expert validation questionnaire sheet uses quantitative descriptive, namely calculating the average percentage of the indicators. While the data analysis assessment of reading skills using the normality test, homogeneity test and t test. This test was calculated using SPSS Statistics 23 with the Paired Samples Statistics test type.
3 Results And Discussion

The development of reading material based on local wisdom literacy based on the ADDIE development model. The process of developing teaching materials through five stages, namely; (1) analysis phase, (2) design stage, (3) development stage, (4) implementation phase, and (5) evaluation phase.

At the analysis stage, the researcher analyzes the core competencies and the basis needed, the researcher analyzes the character of the student, the needs of the teacher, and analyzes the implementation of GLS in the research area. At the planning stage, researchers designed (1) the implementation of the school literacy movement at the stage of habituation and development, (2) the framework of the textbook to be developed, (3) the systematic presentation of the material, and (4) the preparation of assessment instruments. At the development stage, researchers develop teaching materials with steps; (1) pre-writing, (2) drafting teaching materials, and (3) developing assessment instruments. At the implementation stage, teaching materials that are declared feasible by the validators team can be implemented in learning activities. Data obtained from the results of this implementation will be used as data on effectiveness test results. The data obtained will be a reference for revising the teaching materials developed. At this stage the role of the teacher is as a companion and student guide in using the developed teaching material while the researcher was the observer. Implementation of teaching materials developed using the SQ3R method, namely survey, question, read, recite, and review. At the evaluation stage, the researcher analyzes the research data obtained from the feasibility test of the instructional materials developed and tests the effectiveness of the teaching materials developed. The feasibility of teaching materials was obtained from the results of expert validation while the effectiveness data of teaching materials was obtained from the assessment of reading skills.

The results of the material expert's validation obtained a percentage of 81.25% with very good criteria, the results of the linguists' validation obtained a percentage of 91.07% with very good criteria, the results of the book design expert validation obtained a percentage of 88.95%. The average results of expert validation obtained a percentage of 87.09% with the criteria of very good and feasible to use.

The results of the assessment of student reading skills were seen based on pretest and posttest data. The results of the data normality test obtained significance < 0.05. This showed that the pretest value distribution was normal with an average of 73.15 and significance reaches 0.016 while the distribution of posttest values was normal with an average of 90.95 and the significance of the posttest value reaches 0.19. The data homogeneity test obtained significance > 0.05 with pretest values reaching 0.148 while the significance of the posttest values reached 0.252. This shows that the value variants of the pretest and posttest are homogeneous.

The results of the t-test using paired samples statistics obtained a significance of <0.05, namely significance reached 0.000 with an increase in the average pretest and posttest values of 17.8. The results of the t-test can be seen in the Table 1.

Table 1. T-test results of the pretest and posttest values of students' reading skills.

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average pretest</td>
<td>73.15</td>
</tr>
<tr>
<td>Posttest average</td>
<td>90.95</td>
</tr>
</tbody>
</table>
Literacy-based learning that has been implemented will familiarize students with skill in reading. Literacy activities that have been carried out for fourth grade students of SD Negeri 014727 Perupuk were the habituation and development stages. This was aimed at introducing children to the basics of reading and writing, maintaining language awareness, and motivating learning. Throughout learning, students were required to always develop and perfect their abilities in creating various types of texts. By presenting texts containing local wisdom to students, this will implicitly instill noble values of character. Growing a sense of pride in the local wisdom that surrounded the environment and preserving the existing local culture so that it was not easily influenced by the culture that came from outside.

4 Conclusion

Based on the results of the study, it was shown that the process of developing literacy-based teaching materials containing local wisdom in Indonesian language learning in SD Negeri 014727 Perupuk used the ADDIE development model, consisting of five stages namely; analysis phase, design stage, development stage, implementation phase, and evaluation stage. The results of the feasibility test of reading material based on local wisdom-based literacy based on expert validation results obtained an average percentage of 87.09%, with criteria worthy of use.

The results of the effectiveness of reading teaching materials based on local wisdom-filled literacy show that based on the results of the normality test that the pretest and posttest data were normally distributed. The homogeneity test results showed that the variants of the pretest and posttest data were homogeneous. The results of the t-test show an average increase of 17.8 with a significant 0.000. This showed that reading material based on local wisdom-charged literacy was effectively used.

References

How Parents Can Reduce the Negative Impact of Media Devices on Young Children? An Overview of Preliminary Guidance for Parents

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Abstract. Very young children recently have engaged with media devices such as TV set, computer and mobile devices. Playing with all devices is the most attractive activity than interacting with their environment. They look like a quickly learners regarding devices use than their parents and the media devices used by young children is rapidly increases year by year. Many researchers agree that media devices children use have an impact both positive and negative on development and learning. Beside the all benefit of devices for children, parents must also pay attention with the negative impact possibility in devices children use. Therefore, parents play very important role in their children. Parents should be able to encourage their children of avoiding an inappropriate media device use in order to reduce negative impact that can affect their growth and development. The aim of this article is to review some literature about negative impact of young children media device use, suggest preliminary guidance for parents and recommend the future research need.

Keywords: Media devices, young children, negative impact, parent's role

1 Introduction

In the 21st century today, we are entering a digital revolution era called the Industrial Revolution 4.0. The biggest challenge in this century is technology acceleration. Martec’s Law by Scott Brinker explained that technology changes exponentially but organizations change logarithmically which means technology is changing faster than organizations can absorbs change. We will feel its incredible benefit in our lives such as Automation, Big Data, Internet of Thing and Artificial Intelligence so humans must quickly adapt, before being colonized by the technology they make themselves.

Ideally, technology like digital media is essentially created to ease human work become more effective and efficient. But in the reality, it is also influencing all aspects of our lives. Many studies that focus on both the positive and negative impacts of technology, especially for young children. Teachers, parents, health providers, and child development expert all agree that technology children use can have an impact both positive and negative on learning and development [1]. McManis and Gunnewig focus on positive impact of technology for young learners. They have discussed regarding educational technology in three areas: developmental appropriateness, supported implementation, and classroom and curriculum integration. If these area are considered together, it can strengthen the potential of technology to facilitate meaningful learning and development for early learners [2]. On the other hands, most studies focus on negative impact of technology for young children.
of Pediatric indicate that there are some risks of using device like disruption on sleep, attention and learning. Lack of knowledge or information by parents might be one of the causes. Based on developmental theory and educational experts, young children period is the most active period of their lifetime. This is a critical and very important period which all developmental aspects were rapidly increased. Child interaction with the physical and social environment is a very important factor in this period. Therefore in this article, we will discuss and concern about of the negative impact of technology on young children and the role of parents in this case [3].

2 Literature Review

2.1. Negative Impact of Technology For Young Children

Recently the number of children who engage in technology is rapidly increasing every year. The phenomenon calls us to be wisely respond to it. Technology refers to devices such as television, computers and smartphone and to the products that are played or created on these devices such as DVDs, program channels, games and social media. Behind the incredible features and benefits, remain to be aware of all the negative impact possibility.

According to Common Sense Media’s survey research in 2013, the percent of children among 0 to 8 years old used a mobile device is increase rapidly from 52% to 75% in just two years. They found that the time spent with total screen media in average is about one hour a day before age 2, two hours a day at age 2-4 and more than two hours at age 5-8. The most ownership of device is smartphone and tablet, the most popular activity is playing games, watching tv, videos and using apps [1].

Furthermore, American Academy of Pediatrics adapt the Common Sense Media’s survey in 2014, found that almost all children (96%) used mobile device, and most children using device before age 1, at age 2, most children were using mobil devices on a daily basis and spending comparable screen time on television and the mobil device, at age 3-4, children were able to use mobile devices without help, and 1 in 3 were media multitasking and 3 out of 4 children had their own mobil device by age 4. The most device in the home is TV, Tablet and video games console, the most popular ownership of device is Tablet and the most favorite activity is watching TV, Video, use Applications (YouTube and Netflix) and play games. The study implies that ownership of device tend to be free for access on their demand which means parents might be do not know what content that their explore whether it is educative or not [4]. Furthermore, according to several studies, these are some negative impact of using device on young children:

a. Risk of sleep disturbance. The presence of a TV, computer or mobile device in the bedroom, long duration of viewing, light emitted from devices, violent content and daytime screen was associated with delayed bedtime and sleep deficiency [3] and [5].
b. Obesity. There are association between using more than 2 hours per day of TV viewing and obesity, because of lack of physical movement [3].
c. Risk of exposure to inaccurate, inappropriate or unsafe content [3].
d. Depression [3].
e. Risk of addiction [3].
f. Radiation risk. Blue light emitted from devices might cause the radiation risk for eye and brain [3].
g. Poor are sight later. Radiatation effect and time duration of device use in early age can cause poor sight for kids [6].

h. Lack of sosial skill. Device exposure negatively can potentially displace child interaction and other enriching activities. In other hand, before age 2, they are still in sensorimotor stage which require hands-on exploration and social interaction with trusted adult like parent or caregivers for successful maturation and also support development of motor skills [7].

i. Aggressive behavior. [3] There are strong association between violent media content and child aggressive behavior.

j. Difficulty learning. When Infant and young toddler watched videos, they have not been able to transfer knowledge from a 2-dimensional platform to a 3-dimensional world because of lack of symbolic thinking, immature attentional controls and the memory flexibility required.

k. Risk of attention [8]. Time duration in front of devices can be predictor of attention disorder or interference in attention [9].

2.2. The Role of Parents

Family is the first environment for children to get education, especially young children who need a confortable attachment from their parents or caregivers. Parents play a very important role in encouraging of child growth and development and currently it is a big challenge for them because young children are growing up in the digital era. Many studies have found about how parents use media with or around children and implement family rules regarding media and many researches indicate that negative impact of technology for young children is strongly influenced by their treatments. Oftenly, the most reason why parents allow their children engage with media device are to calm them down or keep them quiet or keep them busy while they are working or when their children had temper tantrum [9]. In other hand, parents feel than children need to learn media devices because today’ children live in digital world which means their future is related to digital technology.

According to some researchers’ studies, here are five preliminary guidelines for parents related to media devices children use:

2.3. Parents Is A Role Model for Their Children

Parents should understand their own roles in modeling appropriate media use because children are eminent imitator [3]. Based on child developmental theory, it is recognized that children are active learner and expert in constructing their own knowledge. Children learn through the senses and movements as well as of object in their environment. The interaction with the physical and social environment is the most important thing to do in young children period [10].

2.4. Limiting Young Children’s Media Device Viewing Time

Pay attention to how much time children spend using all screen media. Parents should to reduce children’s devices-viewing time and can balance between media device time and traditional developmental activities time [11]. American Academic of Pediatrics recommended parents only allow their child over age 2 to engaged with all devices no more than 1-2 hours a day and to adapt a healthy Family Media Use Plan from www.healthychildren.org/MediaUsePlan, in order to minimize unhealthy habits and behaviors such as sleep deficiency and tantrum [3] and [8]. Parents should have some potential strategies to limit devices viewing. Parents should encourage a bedtime routin than includes calming
activities and avoids electronic media use [5]. For example, here are some strategies to limit television viewing that is recommended by American Academic of Pediatrics [8]:

a. Turning off the television when no one is actively watching.
b. Turning off the television during meals and no television in eating areas.
c. No television in children’s bedrooms.
d. Eliminate background television.
e. Identify nonscreen, in-home activities that are pleasurable to children.

2.5. The Using of Media Devices Must Support Young Children’s Growth and Development

Parents should be able to choose a developmentally appropriate media device and the content for young children. Parents should collaborate with the teacher in using media devices in a developmentally appropriate with young children. Parents may use the Haugland Developmental Software Scala to evaluate available media devices or application for young children. Furthermore, parents always update their own knowledge about the recent developmentally appropriate activities and alternative strategies for teaching young children [12].

2.6. Limiting Young Children’s Media Device Viewing Time

Parents should discuss media content with their children and pay particular attention to content involving violence, sex, substance use, body image, and the other harm content [11]. Furthermore, parents should try app first then play it with the child about it afterward to see what they is learning [7].

2.7. The Using of Digital Devices and Traditional Development Media Must Be Balanced

Parents should frequently distract the electronic media usage by traditional developmental media into the 21st century child’s life [13]. Children should have given more experiences to use concrete materials in the learning process and to connect with social interaction. Parent-child interactions are important opportunity for emotional connection and are needed for young children development of language, cognition, social skills and emotion regulation [3]. Based on Piaget’s theory that young children at age 2-7 years are in the pre-operational stage where there is a rapidly increase in symbolic activities. Sociodramatic play or pretend play is one of developmentally appropriate for young children in this stage [3].

3 Result and Discussion

This article focuses on describing the negative impact of using devices based on literature from American Research. How about young children in Indonesia? We must pay attention to similar phenomenon regarding media devices use by young children in Indonesia. Therefore, it might be good to adapt American Academy of Pediatrics survey to found whether the result show the similar trend or not.
4 Conclusion

Young children today are growing up in digital era. They would rather engage with media devices than interact with their environment or other activities. Based on some research found that negative impact of using all devices by young children can influence their health, development and learning. The using devices is associated to sleep disturbance, attention disorder, lack of social skills, difficulty learning etc. Therefore, parents play very important role to encourage their children regarding media devices use. Parents should be able to limit the device viewing, control the appropriate content, upgrade knowledge about best strategies to balance media device use and traditional developmental activities to encourage their growth and development. Finally, future research needs to compare to the phenomenon in young children in Indonesia regarding trends of using media devices and whether it indicates negative impact or not.

References

The Effect of Learning Model and Critical Thinking Toward Learning Outcome in Economics of The Tenth Graders in Senior High School

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Abstract. This study aims to: (1) know the comparison of students’ learning outcome in economics which are taught by problem based learning (PBL) model and think pair square (TPS) model. (2) To know whether the students with higher learning outcome have an ability in high critical thinking and low critical thinking. (3) To know the interaction between learning model and critical thinking ability toward the learning outcome in economics. The research method used is quasi experiment with research design of 2 x 2 factorial. The technique in analyzing the data uses ANOVA with two lines at the significance level of α = 0.05. The results of this study show that: (1) The students’ learning outcome in economics who are taught by PBL model is higher than students who are taught by TPS model, with $F_{count} = 6.17 > F_{table} = 3.99$. (2) The students’ learning outcome in economics with high critical thinking ability is higher than students with low critical thinking ability, with $F_{count} = 40.80 > F_{table} = 3.99$. (3) There is interaction between learning model and critical thinking ability toward the learning outcome in economics with $F_{count} > F_{table} = 12.77 > 3.99$.

Keywords: Learning model, critical thinking, economics learning outcomes

1 Introduction

Economics was very necessary in meeting needs, therefore the economy was one of the most important sciences in human life. In general, it can be said that the notion of economics was a field of science studies related to the management of material resources of individuals, communities, and the state to improve the welfare of human life. Therefore, economics was one of the sciences related to human actions and behavior in fulfilling the needs of life that develop with existing resources through consumption, production and distribution activities.

The learning objectives presented by the Ministry of National Education can be concluded to provide basic skills that were meaningful to the lives of students in the community. These goals should lead students to be students who think critically, rationally, creatively, participate intelligently, responsibly, develop positively and democratically, which in turn will develop students' personalities into good economic actors in daily life that can be demonstrated in the process learning and learning outcomes produced.

Learning models also affect students learning outcomes, the reality obtained in the field that the learning model used in economics learning was not as expected, while economics learning required students to be able to think critically and relate to real life in solving problems.
In connection with this, it was necessary to have information on economics learning that people have studied so that the learning objectives can be overcome broadly to facilitate students in understanding learning.

Based on several studies on economics learning, it was informed that understanding economics activities was needed a Problem Based Learning (PBL) learning model to improve economics learning outcomes on students interest because economic learning was not only applying lecture methods, theater, study rooms, and textbooks (Arul: 2007).

Based on those relevant studies, it was necessary to ascertain what learning models were suitable in applying economics learning so that students understood it easily. Thus, one of the factors that need to be considered was the learning process. It was needed to study a more basic learning model because it required an in-depth understanding of the economy and the existing problems so that a learning model was needed and invited students to think critically in solving economics problems. In connection with this form of learning model Problem Based Learning (PBL) can be an alternative in learning Economics, PBL learning model was a student-centered learning model and supported constructivist learning theory [1]. Problem Based Learning (PBL) was a learning model that has the essence of presenting a variety of authentic and meaningful problematic situations to students. The role of the teacher was to present a variety of authentic problems so that it was clear that the activeness of students was required to complete the problem [2]. Another learning model that would be seen as influential was Think Pair Square (TPS). Think Pair Square learning model was a learning model of exchanging pairs that gave students the opportunity to work together with others and an effective way to vary the atmosphere class discussion patterns [3]. This model can be used in all subjects.

Therefore, research was needed to be done on the effect of learning models and critical thinking on economics learning outcomes. The application of the learning model was designed with a very efficient fabric that included students, teachers, learning processes and learning environments, namely Problem Based Learning (PBL) and Think Pair Square (TPS) learning models as factors that could influence the improvement of learning outcomes.

The purpose of this research was to find out: (1) which economics learning outcomes of students were higher taught by problem based learning (PBL) learning models or think pair square (TPS) learning model, (2) the economics learning outcomes of higher students, whether they have high critical thinking skills and who have low critical thinking skills and (3) the interaction between learning models and the ability to think critically about economics learning outcomes.

2 Methodology

This research was carried out at SMAN 6 Padangsidimpuan and at SMAN 4 Padangsidimpuan. The method used in this study was a quasi experimental method (quasi experimental research) with a 2x2 factorial research design with a significance level of 0.05. Before the two-way ANAVA was carried out firstly determined the analytical requirements namely the Normality requirements using the Liliefors Test, while for testing the requirements for Homogeneity using the test Bartlett and F test with the intention that the distribution of samples in the study population were homogeneous. After testing the requirements for analysis, the two-way ANOVA test was carried out. If anava two way was significant, then a
further test (post hoc test) was held because the number of samples per cell was not the same, the Scheffe Test was used.

3 Result and Discussion

3.1 Results
To test hypotheses using factorial 2x2 variance and pathway analysis (ANAVA) techniques, the data were grouped based on the interaction between the learning model and student learning interest. The comparison of groups of data on student learning outcomes was based on researchers' findings.

The differences in student learning outcomes were taught with the PBL (A1) model and those taught with the TPS model (A2). The statistical hypothesis tested was:

\[
\begin{align*}
\text{H}_0: \mu_{A1} &\leq \mu_{A2} \quad (1) \\
\text{H}_a: \mu_{A1} &> \mu_{A2} \quad (2)
\end{align*}
\]

Based on the results of the analysis of variance, the results of the calculation of the learning model data were obtained, where \(F_{\text{observed}} = 6.17\), while the \(F_{\text{table}}\) value with degree of freedom (df) = (1.61) and \(\alpha = 0.05\) was 3.99. These results indicated that \(F_{\text{observed}} = 6.17 > F_{\text{table}} = 3.99\) so that the null hypothesis (Ho) was rejected and the alternative Hypothesis (Ha) was accepted, thus the research hypothesis stated that students' economics learning outcomes taught with PBL models higher than students taught with the TPS model were tested for truth.

The differences in economics learning outcomes between students who have high critical thinking skills with low critical thinking skills statistically hypothesis tested was as follow:

\[
\begin{align*}
\text{H}_0: \mu_{B1} &\leq \mu_{B2} \quad (3) \\
\text{H}_a: \mu_{B1} &> \mu_{B2} \quad (4)
\end{align*}
\]

Based on the results of testing the hypotheses, the results of the calculation of the data of learning interest were obtained, where \(F_{\text{observed}} = 40.80\), while the \(F_{\text{table}}\) value with df = 1.61 and \(\alpha = 0.05\) was 3.99. These results showed that \(F_{\text{observed}} = 40.80 > F_{\text{table}} = 3.99\), so that the Null Hypothesis (Ho) was rejected and the Alternative Hypothesis (Ha) was accepted, thus the research hypothesis stated that economics learning outcomes of students who have critical thinking skills were higher than students who have low critical thinking skills were tested for truth.

The hypothesis of interaction between learning models and students' critical thinking in influencing economic learning outcomes statistically tested was as follow:

\[
\begin{align*}
\text{H}_0: A > <B & = 0 \quad (5) \\
\text{H}_a: A > <B & \neq 0 \quad (6)
\end{align*}
\]

Based on the results of testing the hypotheses, the data calculation of the interaction between the learning and critical thinking models were obtained, where \(F_{\text{observed}} = 12.77\) and \(F_{\text{table}}\) values with df = 1.61 and \(\alpha = 0.05\) was 3.99. This result indicated that \(F_{\text{observed}} > F_{\text{table}} (12.77 > 3.99)\), so the alternative hypothesis (Ha) was accepted and the null hypothesis (Ho) was rejected, meaning that there was interaction between the model of learning and critical
thinking in influencing the outcomes of economics learning. Thus the hypothesis which stated that there was an interaction between the learning model and critical thinking in influencing the learning outcomes of the economics was verified.

The third test results stated that there was an interaction between the learning model and critical thinking on the learning outcomes of students' economics. Then a further test was conducted to find out the average value of which group gave a better or higher influence on the learning outcomes of economics. Further testing was carried out by the Scheffe test.

3.2 Discussions

The economic learning outcomes of students taught with PBL learning models were higher than students who received treatment with the TPS learning model. The results showed that the average of the economics learning outcomes as a whole group of students who received PBL learning model treatment was higher than the group of students who received the TPS learning model treatment. This was because students in the PBL learning model group emphasized grouping/combining discussion learning methods and the ability to think critically. Problem Based Learning did not mean replacing the learning model of discussion in the classroom, but strengthening the learning model because students not only discussed but more sharpen students for critical thinking such as discussing a problem. By learning Problem Based Learning students have established themselves as active learning actors who understood their needs and strive to achieve an understanding of knowledge independently. Activities carried out by students during the learning process took place made students eager to follow the learning process.

The results showed that the average value of learning outcomes in economics students who have high critical thinking skills were higher than students who have low critical thinking abilities. This indicated that students who have high critical thinking skills were better and able to understand economics lessons compared to students who have low critical thinking skills.

So, there was an increase in critical thinking skills. This increase was due to students who can follow the learning well where students can solve the questions posed, the learning model that can foster the spirit of students in learning.

4 Conclusion

Based on the results of the research and discussion that has been stated earlier, then in this study it can be concluded that:

a. Learning outcomes Economics of students taught by problem based learning (PBL) learning models was higher than students taught with Think Pair Square (TPS) learning models.

b. Learning outcomes Economics students who have high critical thinking skills were higher than students who have low critical thinking skills.

c. There was an interaction between the learning model and the ability to think critically about the economics learning outcomes. Students who have high critical thinking skills get higher economic learning outcomes if they were taught using problem based learning (PBL) learning models than Think Pair Square (TPS) learning models, while students who have low critical thinking skills were higher learning outcomes if
learned from Think Pair Square learning models (TPS) rather than problem based learning (PBL) learning models.

References

The Effectiveness of Learning Model SQ4R on Learning Outcomes Indonesian Subject of Students in Elementary School

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Abstract. This study aims to examine the effect of SQ4R model implementation on the learning outcomes of Indonesian in elementary students. The type of this research is Quasi Eksperimen. Sample of this research consist of 60 students. Sampling technique in this research is by purposive sampling technique taking subject not based on random sampling. or area but based on the existence of certain purpose, that is with class of VA as experiment class and VB as a control class. Before the research done, the researchers tested the validity and reliability. Based on data analysis, the research results obtained as follows: average pretest of students in the experimental class before being treated by using SQ4R model of 43.3 and control class obtained the average score of pre-test students of 55.2. And the result of study of experiment class student after being treated by using SQ4R model equal to 74,2 and in control class obtained average value 63,7. Thus there is a significant influence on the application of SQ4R learning model to the learning outcomes of Indonesian Primary School Students. Based on the results of research can be concluded that there is influence of SQ4R model on learning outcomes Indonesian.

Keywords: Learning model, SQ4R, indonesian subject, learning outcomes

1 Introduction

Education is an effort of every nation and state to pass on knowledge from generation to generation. The education is also expected to create high quality and competitive learners to face the competition in the globalization era today. Improving the quality of human resources is one of the emphasis of educational goals. The success of the national education system is strongly influenced by the teaching process that the teacher provides. Therefore, teachers as educators should be able to create an atmosphere of learning that can help improve the quality of education peoses itself.

Indonesian as a communication tool of Indonesian society that has a role to lead and deliver knowledge to various circles and level of education. All levels of education in delivery, of course using the Indonesian language as the introduction. Therefore, the Indonesian language clearly has an important role as a material science and technology in its dissemination to the world of education.

In accordance with the position of Bahasa Indonesia as the national language and the language of the country. So, the function of Indonesian language and literature subjects are: (1) means of fostering unity and unity of the nation (2) means of improving knowledge and
skills of Indonesian language in order to preserve and develop culture (3) means of increasing knowledge and skills of Indonesian language to reach and develop science Knowledge, skills and art (4) means of disseminating the use of good Indonesian bah for the purposes of various problems, and (5) means of developing reasoning.

The scope of Indonesian language and literature subjects covers language mastery, ability to understand, appreciate literature, and the ability to use the Indonesian. Indonesian learning is directed to improve students' ability to communicate in good and correct Indonesian, either orally or in writing. In learning Indonesian in primary school there are four aspects of language skills that include listening, speaking, reading and writing skills. The four aspects of language skills are related to one another.

Based on the results of observations and interviews of researchers to teachers of primary school in Medan is known that the value of student learning outcomes is low and has not reached the Indonesian KKM is 70. Teachers use less variation in the process of learning Indonesian, in other words teachers tend to use conventional methods in which teacher-centered learning activities, so that students are less active in the learning process where students are less able to express their opinions.

One of the fundamental things that teachers need to understand is how to understand the position of the learning model as one of the components for the success of learning activities. Teachers need to determine the appropriate model of learning so that the material can be easily understood learning students, teachers are obliged to implement improvements in learning.

The SQ4R model (survey, question, read, reflect, recite, and review) is one of the techniques of reading to understand the content of the reading that uses the steps systematically in its implementation. In using this model of course, a reader needs to determine in advance the purpose of reading. In addition, readers also need to determine the focus information they need. Where in this model, students are directed to scrutinize, create questions, read texts, review, and provide examples in the actual context. With this learning model is expected to learn Indonesian student learning can be increased.

The learning process is a very important element in the process of education in schools. A person's view of learning affects his or her learning-related actions and everyone has a different view of learning. By learning human beings will be able to change itself towards the better in terms of knowledge, skills, and attitude. Psychologically, learning is a process of change that changes behavior as a result of interaction with the environment in meeting their needs, the changes will be evident throughout aspects of behavior.

[1] says that learning is a process of behavior change to achieve a wide range of knowledge, skills and attitudes. Learning is a process of interaction between stimulus and response. Learning is considered as a process of behavior change as a result of the experience and practice. Learning is a process of behavior change due to experience and practice. The objective of the study is the change in behavior, both concerning the knowledge, skills, attitudes [2]. According to [3] Learning is defined as a persisting change in human performance or performance potential, learning comes about as a consequence of, the learner’s experience and interaction with the world. Based on the above quote, learning is defined as the last change in human performance or potential performance, learning emerged as a consequence of the student experience and interaction with the environment.

Learning is a process attempts someone who aims to obtain a change in behavior or overall appearance both concerning the knowledge, skills, attitudes with a series of learning activities for example by reading, watching, listening, etc. It can be concluded that learning can not be separated from human life. Where learning is a process of interaction with the environment. Learning can also be interpreted as the individual events, the events of the
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It's basically what the results obtained from an activity, while learning is a process that resulted in a change in individuals, the changes in behavior, both aspects of the knowledge, skills and attitude aspects.

The learning result is a term used to indicate the level of success achieved by a person after certain business. In this case the learning outcomes achieved by students in a particular field of study after participating in the learning process. In the process of obtaining a good result it is necessary to learn appropriate learning methods means that in accordance with the conditions and circumstances of everyday life are contextual, so what is the result of learning can be met with a number of measurements of learning outcomes that meet the standards.

According to [4] learning is generally interpreted as a change in individuals that occur through experience, and not because of the growth or development of the body or characteristics of a person from birth”. Meanwhile, according to [5] learning is a business or activity that aims to make changes within a person include changes in behavior, attitudes, habits, science, skills, and so on.

Meanwhile, according to [6] learning is a process of business undertaken by a person to gain a new change of behavior as a whole, as a result of his own experience in interaction with the environment. From some of the expert opinions above can be understood that the changes include the goals that want to be generated from the learning process as a result of business or activities in the form of experience in interaction with the environment.

This is reinforced by the opinion of [7] learning is a change of behavior or appearance, with a series of activities. For example, by reading, observing, listening, imitating, and so on. Based on the opinions of the experts above, it can be defined that learning is an activity aimed at generating behavioral changes based on individual experience in interaction with the environment, which involves cognitive, affective, and psychomotor aspects. Education is an effort of every nation and state to pass on knowledge from generation to generation. The education is also expected to create high quality and competitive learners to face the competition in the globalization era today. Improving the quality of human resources is one of the emphasis of educational goals. The success of the national education system is strongly influenced by the teaching process that the teacher provides. Therefore, teachers as educators should be able to create an atmosphere of learning that can help improve the quality of education peoses itself.

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It's basically what the results obtained from an activity, while learning is a process that resulted in a change in individuals, the changes in behavior, both aspects of the knowledge, skills and attitude aspects. The learning result is a term used to indicate the level of success achieved by a person after certain business. In this case the learning outcomes achieved by students in a particular field of study after participating in the learning process. In the process of obtaining a good result it is necessary to learn appropriate learning methods means that in accordance with the conditions and circumstances of everyday life are contextual, so what is the result of learning can be met with a number of measurements of learning outcomes that meet the standards.

According to [4] learning is generally interpreted as a change in individuals that occur through experience, and not because of the growth or development of the body or characteristics of a person from birth”. Meanwhile, according to [5] learning is a business or activity that aims to make changes within a person include changes in behavior, attitudes, habits, science, skills, and so on. Meanwhile, according to [6], learning is a process of business
undertaken by a person to gain a new change of behavior as a whole, as a result of his own experience in interaction with the environment. From some of the expert opinions above can be understood that the changes include the goals that want to be generated from the learning process as a result of business or activities in the form of experience in interaction with the environment. This is reinforced by the opinion of [7] learning is a change of behavior or appearance, with a series of activities. For example, by reading, observing, listening, imitating, and so on. Based on the opinions of the experts above, it can be defined that learning is an activity aimed at generating behavioral changes based on individual experience in interaction with the environment, which involves cognitive, affective, and psychomotor aspects. Erated from the learning process as a result of business or activities in the form of experience in interaction with the environment.

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Education is an effort of every nation and state to pass on knowledge from generation to generation. The education is also expected to create high quality and competitive learners to face the competition in the globalization era today. Improving the quality of human resources is one of the emphasis of educational goals. The success of the national education system is strongly influenced by the teaching process that the teacher provides. Therefore, teachers as educators should be able to create an atmosphere of learning that can help improve the quality of education peoses itself. Indonesian as a communication tool of Indonesian society that has a role to lead and deliver knowledge to various circles and level of education. All levels of education in delivery, of course using the Indonesian language as the introduction. Therefore, the Indonesian language clearly has an important role as a material science and technology in its dissemination to the world of education.

In accordance with the position of Bahasa Indonesia as the national language and the language of the country. So, the function of Indonesian language and literature subjects are: (1) means of fostering unity and unity of the nation (2) means of improving knowledge and skills of Indonesian language in order to preserve and develop culture (3) means of increasing knowledge and skills of Indonesian language to reach and develop science Knowledge, skills and art (4) means of disseminating the use of good Indonesian bebah for the purposes of various problems, and (5) means of developing reasoning.

The scope of Indonesian language and literature subjects covers language mastery, ability to understand, appreciate literature, and the ability to use the Indonesian. Indonesian learning is directed to improve students' ability to communicate in good and correct Indonesian, either orally or in writing. In learning Indonesian in primary school there are four aspects of language skills that include listening, speaking, reading and writing skills. The four aspects of language skills are related to one another. Based on the results of observations and interviews of researchers to teachers of primary school in Medan is known that the value of student learning outcomes is low and has not reached the Indonesian KKM is 70. Teachers use less variation in the process of learning Indonesian, in other words teachers tend to use conventional methods in which teacher-centered learning activities, so that students are less active in the learning process where students are less able to express their opinions.

One of the fundamental things that teachers need to understand is how to understand the position of the learning model as one of the components for the success of learning activities.
Teachers need to determine the appropriate model of learning so that the material can be easily understood learning students, teachers are obliged to implement improvements in learning. The SQ4R model (survey, question, read, reflect, recite, and review) is one of the techniques of reading to understand the content of the reading that uses the steps systematically in its implementation. In using this model of course, a reader needs to determine in advance the purpose of reading. In addition, readers also need to determine the focus information they need. Where in this model, students are directed to scrutinize, create questions, read texts, review, and provide examples in the actual context. With this learning model is expected to learn Indonesian student learning can be increased.

The learning process is a very important element in the process of education in schools. A person's view of learning affects his or her learning-related actions and everyone has a different view of learning. By learning human beings will be able to change itself towards the better in terms of knowledge, skills, and attitude. Psychologically, learning is a process of change that changes behavior as a result of interaction with the environment in meeting their needs, the changes will be evident throughout aspects of behavior. [1] says that learning is a process of behavior change to achieve a wide range of knowledge, skills and attitudes. Learning is a process of interaction between stimulus and response. Learning is considered as a process of behavior change as a result of the experience and practice learning is a process of behavior change due to experience and practice. The objective of the study is the change in behavior, both concerning the knowledge, skills, attitudes [2]. According to[3] .Learning is defined as a persisting change in human performance or performance potential, learning comes about as a consequence of, the learner’s experience and interaction with the world. Based on the above quote, learning is defined as the last change in human performance or potential performance, learning emerged as a consequence of the student experience and interaction with the environment.

Learning is a process attempts someone who aims to obtain a change in behavior or overall appearance both concerning the knowledge, skills, attitudes with a series of learning activities for example by reading, watching, listening, etc. It can be concluded that learning can not be separated from human life. Where learning is a process of interaction with the environment. Learning can also be interpreted as the individual events, the events of the occurrence of a change in behavior as a result of the experience. Learning would be better if the subject learning experience or do it yourself through a variety of events and activities they do.

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experience in interaction with the environment. From some of the expert opinions above can be understood that the changes include [1] the goals that want to be generated from the learning process as a result of business or activities in the form of experience in interaction with the environment.

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2 Methodology

2.1 Learning Outcomes

In every learning process, learning outcomes are benchmarks in determining the success rate of one's learning activity based on the learning experience. Both learning outcomes are based on the cognitive, affective, and psychomotor domains. says that learning outcomes are the results achieved by students who have followed the process of learning.

Gagne outlines the behavioral changes that are the result of learning can be: a) the information verbally, namely the mastery of information in verbal form, either orally or in writing, b) intellectual faculties, namely individual skills in interacting with its environment by using symbols, c) strategies cognitive, an individual's ability to perform the overall management of activities. In the context of the learning process is the ability to use the strategy cognitive memories and ways of thinking that occurs effective activity, d) attitude, the learning outcomes in the form of an individual's ability to choose the kind of action to be carried out, e) is the result of learning motor skills in the form of skills be controlled by muscle and physical. Based on the opinion of the learning outcomes are concrete actions consist of demonstration of knowledge, skills and values [8].

It's basically what the results obtained from an activity, while learning is a process that resulted in a change in individuals, the changes in behavior, both aspects of the knowledge, skills and attitude aspects. The learning result is a term used to indicate the level of success achieved by a person after certain business. In this case the learning outcomes achieved by students in a particular field of study after participating in the learning process. In the process of obtaining a good result it is necessary to learn appropriate learning methods means that in accordance with the conditions and circumstances of everyday life are contextual, so what is the result of learning can be met with a number of measurements of learning outcomes that meet the standards.

Furthermore, according to [9] changes as a result of the learning process can be shown in various forms, such as skills, habits, attitudes, acceptance, or appreciation. Such changes may include his condition, his knowledge and his actions ". This is in line with Hamalik's opinion the results of learning appear in each change aspects as follows: "a) knowledge, b) understanding, c) habits, d) skills, e) appreciation, f) emotional, g) Social relations, h) physical, i) manners, j) attitude [10].

Learning outcomes are the abilities students have after receiving the learning experience. To evaluate the expected student learning outcomes, it is necessary to have operational objectives that are objectives of behavior that can be done and measured. According to [11] that: "Learning outcomes are changes in behavior as a whole is not just one aspect of human
potential alone, meaning learning outcomes are not fragmentary or separate but comprehensive."

Most theorists of “cognitive knowledge” as the information that people know about the factors associated with homework and learning strategies, and “cognitive set” to a variety of administrative actions, such as attention, reviewing, planning, and identification of errors at the point and the impact of cognitive activities, or their differences, metacognitives beliefs prominent role in guiding behavior [12].

Meanwhile, according to [13] said that: learning outcomes is a change in behavior as a result of learning in the sense that should cover the field of cognitive, affective, and psychomotoris. Therefore, in the assessment of learning outcomes, the instructional role that contains the formulation of the desired abilities and behaviors controlled by students becomes an important element as the basis and reference of assessment.

Based on the opinion of the experts above can be concluded that the results of learning is a behavioral change that includes aspects of cognitive, affective, and psychomotor based on the assessment conducted in the process of learning activities. Where the changes can be applied in everyday life.

Factors Affecting Learning Outcomes

Low learning outcomes are a constraint in every learning process. Therefore, teachers as educators should find a solution of any problems that hinder the success of the learning process such as low student learning outcomes. Therefore, to achieve learning outcomes in accordance with the expected it is necessary to note several factors that influence the learning outcomes. In this case [14] classify factors that influence learning outcomes directly or indirectly into four groups, namely: (1) learner factors that include basic capacity, special talent, motivation, interest, maturity and readiness, Attitudes and habits. (2) factors of good facilities and infrastructures related to the quality, completeness, and usage. (3) environmental factors, whether physical, social, and culture where the learning activities implemented.

Furthermore [6] argues that: "Factors that affect learning outcomes of many types, but can be classified into two groups only, namely internal and external factors. Internal factors are factors that exist within the individual who is learning, while external factors are factors that exist outside the individual. In addition to learning models, other factors that affect the success of a learning process is the students themselves. Students have characteristics that can affect student achievement include: gender and learning style [15].

[16] explains that the factors that influence learning outcomes are as follows: (a) internal factors, ie factors that originate within the self itself, which includes two physiological aspects of a physical nature and psychological aspects that are spiritual In the organism. (b) the external factor of the student, the factor that comes from outside the student's self, which consists of two kinds of social environment factors (such as teachers, administrative staff and classmates) and social environment factors (such as school buildings and their location, Student's family residence, learning tools, weather conditions, and study time used by students). (c) learning approach factor that is kind of student learning effort which include strategy and method used by student to do activity studying learning materials.

Based on the opinion of the experts above can be concluded that the results of student learning is influenced by factors of self-discipline students in the form of interest, motivation, self concept, and attitude in learning. But besides that, there are factors that influence the outcomes of learning from outside the students self is the school environment, family environment, and community environment.

Models are the means used by teachers in carrying out teaching and learning activities in the classroom as an effort to achieve to achieve the learning objectives that have been set. In
learning activities, models are needed by teachers and use varies according to the goals to be achieved. A teacher will not achieve and complete the learning objectives well if not mastered and use methods that are appropriate to the learning objectives.

According to [16] that: a model is a strategy or a way that contains standard procedures for carrying out the presentation of materials to students. This is in line with the opinion of [17] that "a model is a means used to achieve predetermined goals". Meanwhile, according to [18] that, "the model is the whole set of presentation of teaching materials that cover all aspects before and after the learning process conducted by teachers and all related facilities used directly or indirectly in the teaching and learning process".

Based on the opinion of the experts above can be concluded that the model is a way or teaching strategies undertaken by the teacher in the ongoing learning process to achieve learning objectives and tailored to the conditions, situations and materials to be taught.

2.2. Model Survey, Question, Read, Reflect, Recite, Review (SQ4R)

In improving student learning outcomes, there are many things teachers can do. One way is to apply the appropriate learning model. So as to achieve the objectives of each learning activities undertaken. One such model is the SQ4R model (Survey, Question, Read, Reflect, Recite, Review). Where [15] states that the SQ4R learning model produces better learning outcomes than SQ3R and Direct learning.

According to [19] One of the most popular memory improvement techniques, is SQ4R This method name is made by six initial related to learning and memory organized as a pre-reading, question, read / think, memorize, and review saying SQ4R. According to [9] SQ4R is the development of SQ3R by adding the reflect element, which is the activity of providing examples of reading material and envisioning the relevant actual context.

According to [20] SQ4R is one of the learning models that is the solution of the problem of low comprehension ability of reading. This model is a development of the SQ3R method by adding the Reflect element, ie the teacher's activity provides an open-ended problem related to the actual context relevant to daily life. Then students will slay discuss with friends of his group to find solutions of the problems based on the knowledge they have gained in the read stage. The existence of problems that are open-ended, can cause critical thinking of students and teachers to know the extent of knowledge that has been owned by students.

Furthermore, according to Uno (2012: 115) SQ4R is one part of elaboration strategy that serves to form students' habits of concentrating in reading, practicing fast reading skills, practicing forecasting power with regard to reading content and developing critical and cooperative reading skills. More details [21] explains that the intent of the Survey, Question, Read, Reflect, recite, study model is as follows: a). Surveys by looking at text reading and note-marking keywords; b). Question by making a question (why-how, from which) about reading material (teaching material material); c). Read by reading the text and looking for the answer; d). Reflect ie activity provides examples of reading material and envisages the relevant actual context; E). Review by thorough reviewing; f). Recite considering the given answer note-sharing together.

[22] One of the most popular techniques to improve memory, pre-reading, question, read, think, say, and review the method of preservation is so famous conclusion. Learning is one of the main sources of environmental compatibility. Student efficacy, then other of your abilities, your knowledge and less compared to other according to their standards and capabilities to deal with learning problems. Is seen in terms of ability and talent students who are learning the same level, academic performance when you try and learn to try different
show. Based on the opinion of the experts above can be defined that the model SQ4R is a model of learning in which there are several steps such as surveys, question, read, reflect, recite, reviews that are considered able to assist teachers in knowing how far the knowledge has been owned students.

In the application of the SQ4R model there are several benefits that are, according to [4] the general benefit of this model, which helps learners to take the position that the read source will be read as necessary or not, equip learners with a systematic approach To the types of reading, facilitate learners in understanding the contents of readings that are read. Based on the opinion of the experts above can be concluded that the benefits of the SQ4R model is to help students in improving their skills both in terms of knowledge, concentration of critical thinking, and improve learning outcomes.

In this study leads to a strategy that builds a general picture of the material being taught, creates questions and finds answers to questions independently, and is able to provide relevant examples in actuality. The steps of implementation of learning through SQ4R strategy in class V students in this study according to [23] include: a) Teachers open lessons and inform learning goals. b) teachers provide text reading that will be read by students. The text used has different headings in each of its meetings. c) the teacher opens the lesson with apersepsi in accordance with the purpose of learning. d) Students form groups of 4-5 students. The group formed will be assigned to discuss the given worksheet. e) After each group receives the text, the teacher gives the task of reading the survey, including the title, the length of the text, the many paragraphs, and possible terms. f) each group member makes a question of reading. g) group representatives to read each paragraph in turn. while other group members listen carefully while seeking answers to the questions that have been made. h) group members write down answers to these questions and then take turns reading them in front of the group. Group members who did not take turns read the answers to the task of defining the correctness of the reflected answers: a) students write down the content of the story and retell it in their own language (recite), b) the group rereading the reading (revieu) To complete new tasks together, ie by making conclusions or digest. c) Student with teacher concludes learning that has been done, d) teacher give test to student.

Each model of learning can have several deficiencies and advantages. Included in the SQ4R learning model (Survey, Question, Read, Reflect, Recite, Review). In his book [21] describes several advantages and disadvantages of the SQ4R learning model, including as follows: The advantages of SQ4R are as follows: a) with a survey stage at the beginning of the lesson, it arouses students' curiosity about the material to be learned so as to increase student motivation in learning. B) students are given the opportunity to ask their own questions and try to find answers from the question itself by doing the reading activity. Thus, it can encourage students to think critically, be active in learning and meaningful learning. c) the material students learn is attached to longer periods of time. The weakness of SQ4R, is as follows: a) this strategy can not be applied to all subjects of physics and because the material of physics is not always easy to understand by reading only, but also the need for practicum, b) the teacher will have difficulty in preparing the reading book for each student if not all students have a reading book.

<table>
<thead>
<tr>
<th>No</th>
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<th>Average</th>
<th>Standart Deviation</th>
<th>L0</th>
<th>L table (Lt)</th>
<th>Criteria</th>
<th>Information</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<td>8,23</td>
<td>0,156</td>
<td>0,161</td>
<td>L&lt;\text{Lt}</td>
<td>NORMAL</td>
</tr>
</tbody>
</table>
The type of research used in this study is quasi experimental research using nonequivalent control group design. The none-equivalent control group design study was a study comparing pretest and posttest values. The population in this study is all students of grade V SDN in Medan. The research consists of 2 classes Samples totaling 60 students.

The procedure of this research is done by three stages: a) conducting pretest that is conducting test to know the student's early ability about the subject matter to be delivered either in the experimental class or control class with the same test question. B) implementing teaching treatment that is by using elaboration approach (SQ4R method) in the experimental class and provide teaching treatment using expository approach in the control class c) holding post test that is conducting test to know the student's active ability about the learning material which has been delivered with the same problem after being given the teaching treatment each (See Table 1.).

### 3 Result and Discussion

Description of Research Data Result This research was conducted in Grade V of elementary school in Medan in. This research involves two classes which are given different learning approach, that is experiment class by using SQ4R model and control class using expository approach. This study uses multiple choice test instruments that amounted to 20 questions. Before the test instrument is given to the students of class V elementary school in Medan, then the first instrument is tested the level of validity. Before the two classes were given different teaching treatments, the two classes were first given a pre-test that aims to determine the initial learning ability of each class. Whereas post test is given to know student learning outcomes after learning with different treatment in both sample groups.

From mean of pre test of 43,3 in experiment class, it is necessary to follow up by doing treatment that is using SQ4R model in experiment class, after conducted test treatment with pre test to post test increased to 74,2. And the value of each student increases from pre test to post test. From the average pre test of 55,2 in the control class, it is necessary to follow up by conducting the treatment that is using the lecture method in the control class, after the treatment is then tested with post test where the average value increased to 63.7.

Normality Test is a test to control whether the data obtained has a normal distribution can be used in statistics. The purpose of the Normality test is to find out whether the distribution is normal. Testing of Normality of Data Pre test in control and experimental class is done by Liliefors test, with significance level (α = 0,05), with test criterion Normality is \( L_{count} < L_{table} \) then sample is Normal distributed

<table>
<thead>
<tr>
<th></th>
<th>Normality Test of Post Test of Experiment Class</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>74,2</td>
<td>13,52</td>
<td>0,157</td>
<td>0,161</td>
</tr>
<tr>
<td>3</td>
<td>Normality Test of Pre-Test of Control Class</td>
<td>55,16</td>
<td>10,46</td>
<td>0,134</td>
<td>0,161</td>
</tr>
<tr>
<td>4</td>
<td>Normality Test of Post Test of Control Class</td>
<td>63,66</td>
<td>10,9</td>
<td>0,149</td>
<td>0,161</td>
</tr>
</tbody>
</table>
the normality test and the result is normal distribution then the next test Homogeneity with criteria $F_{\text{count}} < F_{\text{table}}$, it can be stated Homogeneous (See Table 2).

<table>
<thead>
<tr>
<th>No</th>
<th>Data of Class</th>
<th>$F_{\text{count}}$</th>
<th>$F_{\text{table}}$</th>
<th>Criteria</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Homogeneous Test of Post Test of Control Class</td>
<td>1.61</td>
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<td>$F_{\text{count}} &lt; F_{\text{table}}$</td>
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</tr>
<tr>
<td>2</td>
<td>Homogeneous Test of Post Test of Control Class</td>
<td>1.54</td>
<td>1.87</td>
<td>$F_{\text{count}} &lt; F_{\text{table}}$</td>
<td>Homogeneous</td>
</tr>
</tbody>
</table>

Based on the above table, it can be concluded that the learning result data of Indonesian language of students class V A and V B with SQ4R model and expository method are stated have the same or homogeneous variance.

3.1 Hypothesis Testing

From the above discussion has been tested Normality and the results are normal. Homogeneity and homogeneous results have also been conducted (See Table 3).

<table>
<thead>
<tr>
<th>Kelas Eksperimen</th>
<th>Kelas Kontrol</th>
<th>$t_{\text{table}}$</th>
<th>$t_{\text{hitung}}$</th>
<th>Kriteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (amount)</td>
<td>30</td>
<td>30</td>
<td>2.076</td>
<td>3.324</td>
</tr>
<tr>
<td>$S$</td>
<td>13.52</td>
<td>10.9</td>
<td></td>
<td>$t_{\text{count}} &gt; t_{\text{table}}$</td>
</tr>
<tr>
<td>$S^2$</td>
<td>182.8</td>
<td>118.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.2. Discussion

The research conducted at SDN in Medan aims to determine the effect of SQ4R model on the learning outcomes of Indonesian language. This research is classified as an experimental research involving two classes with different treatment. Class V A as experiment class and class V B as control class. Students’ learning outcomes are based on individual absorption and classical absorption. Absorption capacity referred to in this study is seen from the final test score after the students held the learning process using SQ4R model. Before doing the research, the researcher first tested the test in the form of validity test, test reliability, differentiator test and test difficulty level to 20 students who are considered to have the same criteria as the research sample.

After testing the research instrument consisting of 50 items where 20 items were declared valid and used as a tool of data collecting about learning result of Indonesian language with material of folklore. To know the students’ initial ability, the researcher performs the Pre-test in the experimental class and control class. Where the number of test questions as many as 20 questions and the same type of problem, obtained the results of experimental class with average score of 43.3 and obtained the results of control class with an average score of 55.2. Can be seen the results of the ability of the initial test low students. Furthermore, the two classes were given different treatment. The experimental class applied the SQ4R model and the control class applied the expository approach particularly with the use of lecture methods.
After that both classes are given a post test with the same problem as in the matter of pre-test, but the sequence of question numbers are randomized. In the experimental class obtained an average post-test capability of 74.2 and in the class of Kontol obtained average post test ability is 63.7. It can be seen that a higher pre-test and post test score is an experimental class with SQ4R model. And with SQ4R model students are able to achieve an average value above the KKM. So, this research can be said to be successful.

This research is in line with research conducted by Putu Indah Widayadnyani Rahayu. Where the analysis results show $t_{hit} = 4.21$ while $t_{tab}$ at 5% significance level with $dk = 73$ of 2,000, so $t_{hit} > t_{tab}$. This analysis shows that $H_a$ is accepted and $H_0$ is rejected. In addition, other related studies also show the same where the research conducted at SMP Empu Tantular Semarang shows the results of research that has been obtained obtained the average post test class experimental rate is 76.07 and the average control class that is 70.61. The result of hypothesis test ($t$ test and simple regression test) post test value got significance value $= 0.00 < \text{significance level} = 0.05$ which mean there is difference of result of experiment class study history with control class, whereas simple regression test significance value $= 0.037$ with The level of significance $= 0.05$ because the level of significance $< \text{level of significance}$ it can be concluded $H_a$ accepted which means there is influence of learning SQ4R on student learning outcomes. Coefficient of determination $= 0.689$. This means that 68.9% of student learning outcomes are influenced by SQ4R learning and the remaining 31.1% is influenced by other factors. The percentage of completeness of experimental class learning result is 89.47% ≥ 75%, while the percentage of mastery of classical learning achievement of control class reaches 56.75% < 75%. So, it can be concluded that Learning by using SQ4R model more effective.

4 Conclusion

Based on the results of the research it can be concluded as follows:

a. The results showed that the learning outcomes of Indonesian language students elementary school after applied SQ4R model increased compared with the result of learning Indonesian students using expository approach. Thus it can be seen that there are improvements that occur to the learning result of Indonesian language using SQ4R model. It can be seen from the average of test result using SQ4R model that is 74.2. While the test results with expository approach method of lecturing is 63.7.

b. There is a positive and significant influence between the use of SQ4R model on the learning outcomes of Indonesian language students in elementary school. It can be seen from the results of the hypothesis test calculation obtained $t_{count} > t_{table}$ is 3.324 > 2.076 at a significant level $\alpha = 0.05$.

References

Strategy of Principal Guiding as a Supervisor in Improving Teachers Performance in Al-Muslimin Junior Islamic School of Hamparan Perak

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Abstract. This research was intended to find out the results achieved from the implementation of the school principal guiding strategy as a supervisor to improve teachers' performance in the Al-Muslimin Junior Islamic School of Hamparan Perak. The focus of this study included: first, what was the strategy of the principal in carrying out his duties as a supervisor. Second, what factors influenced the supervision of the principal as a supervisor to improve the teacher's performance in Al-Muslimin Junior Islamic School of Hamparan Perak. This study used a naturalistic qualitative approach. The strategy of the principal of the Al-Muslimin Junior Islamic School of Hamparan Perak in improving teacher's performance was by supervising. The techniques in supervision were individual techniques such as class visits, class observations, personal talks and group techniques, namely discussion.

Keywords: Strategy of principal guiding, supervisors, teacher performance

1 Introduction

The school principal was the highest leadership in the schools and as the functional power of teacher given the additional task to lead a school in which it was organized a learning process or places where there was interaction between the teacher who gave the materials and students who receive the materials [1]. His leadership pattern will be very influential in determining the progress of the school. Soewadjı Lazaruth revealed that there were three functions of the principal, namely as an education administrator, education supervisor , and education leader [2]. Therefore, in modern education the leadership of the principal was a strategic position in achieving educational goals.

Leadership in educational units always involved the efforts of a principal to influence the behavior of his subordinates. These efforts can be realized by the ability to foster, guide, supervise, control, and provide an approach to all school members, especially to the teachers. Usman's sequential leadership [3], was science and art that can influence people or groups to act as expected to achieve goals effectively and efficiently.

In Regulation of National Ministry of Education No. 13 of 2007 concerning to the Competency Standards for Principals/Islamic schools as follows: (1) managerial
competencies, (2) entrepreneurial competencies, (3) supervisory competencies, and (4) personality competencies.

The Law of the Republic of Indonesia number 20 of 2003 concerning National Education System Chapter XI article number 39, "Educators were professionals who were tasked with planning and implementing the learning process, assessing learning outcomes, conducting guidance and training, and conducting research and community service especially for educators in college". In this case, it was emphasized that the implementation of the provisions concerning management, assessment, guidance, supervision and development of schools administered by the government was the responsibility of the government. However, it was also emphasized that principals were responsible for organizing educational activities to always hold coaching.

According to Wahjosumidjo [4] "among of education providers who must be continuously nurtured continuously by the principal were a teaching program, human resources, physical resources, cooperative relations between the principal and the community".

Based on observations and facts in the field, it was found that expectations were not in line with the reality of teacher performance in Islamic Junior High schools.

The indicators were the low quality of school education results, the principal's task as supervisor, the teacher's low performance and learning activities did not run smoothly due to frequent delays and teacher absence. Administrative activities related to teaching administration such as making lesson plans not going well because there were some teachers who cannot and did not understand how to make lesson plans according to the procedure. Another indication was that there were still teachers who did not master teaching materials because before starting the learning activities the teacher did not make plans and was not in accordance with their fields.

The teachers' performance issues were not directly affected by the school leadership. Based on observations in the field it was known that the guidance carried out by the principal was not optimal. The principal has not been able to serve the various needs of teachers and students, who can help and encourage teachers to carry out tasks in the administrative field.

Islamic Junior High School is a formal educational institution at the junior high school level, still very marginalized because its quality is still low compared to other educational institutions. Current development conditions of the Islamic school: (a) management capabilities have not been as expected; (b) the level of teacher education was mostly not commensurate with the requirements set and methodological capabilities were still low; (c) the learning abilities of Islamic school teachers mostly still emphasize the introduction of cognitive concepts and have not emphasized religious behavior, social ethics and noble character [5].

Therefore, it is necessary to do a research on the strategy of Guiding School Principals as Supervisors in Improving Teacher's Performance at the Islamic Junior High School of Al-Muslim of Hamparan Perak.

The purpose of this study were: (1) to find out the strategy of principal guiding towards the teacher through supervision at Islamic Junior High School of Al-Muslim in, (2) to find out the strategy of principal guiding towards teachers through supervision able to improve teacher performance at Islamic Junior High School of Al-Muslim in, (3) to describe the process of principal guiding implementation strategy towards the teachers through supervision in Islamic Junior High School of Al-Muslim, (4) to provide a positive response from the teachers to the implementation of the principal guiding strategy towards the teachers through supervision in the Islamic Junior High School of Al-Muslim.


2 Methodology

This research was carried out in the Islamic Junior High School (Madrasah Tsanawiyah Al-Muslimin Hamparan Perak) located on Jl. Chandradimuka no. 323 Klumpang Kebun sub-district of Hamparan Perak, Deli Serdang Regency. This method was chosen based on the consideration that what was sought was that it would give a picture or paint a more complex social reality in such a way that it became a concrete social phenomenon.

3 Result and Discussion

3.1 Results

The results of researcher interviews with the school principal at the first step described the supervision of the principal from planning, implementation, follow-up supervision. In this case, the principal has been able to undergo supervision in accordance with the procedure, but there were still many obstacles that must be resolved so that the supervision of the principal can obtain satisfactory results.

To corroborate the results of research on the supervision of principals on teachers at Islamic Junior High School of Al-Muslimin at the second step of the researchers conducted interviews about supervision of the Quran Hadist teachers. Based on the interviews carried out the results showed that the principal as a supervisor meant that he should be good at researching, searching for, and determining the conditions for what was needed for the progress of his school so that the educational objectives of the school can be achieved as much as possible.

In the third step the researchers conducted interviews with teachers, regarding to the supervision of the school principal obtained the results that the principal had not provided a diverse strategy to the teachers. For this reason, the school principal needed to provide a strategy that can make supervision more attractive and not a scary thing for the teachers.

So, the learning objectives can be achieved through supervising the Islamic Junior High School principals. The techniques in supervision were numerous and varied, individual techniques, techniques were group. The techniques used by the principal of Islamic Junior High School of Al-Muslimin were class visits, observation, discussion, self-assessment, and teacher meetings.

3.2 Discussions

The results of the study showed that in improving the performance of Islamic Junior High School of Al-Muslimin teachers in teaching and learning activities the principal did supervision. While teacher performance was seen from the presence of the teacher, implementation of lesson plan (RPP) making, teacher assessment and the implementation of learning. The Islamic Junior High School principal directly saw the teacher’s attendance list (attendance) every day so the principal could know the character of the teachers less active in teaching. The principal can hold class supervision to find out the teachers’ active teaching, by supervising to help in improving the quality of teachers in implementation of RPP making because they have very effective guidance starting from making up to giving advice to teachers if they have errors in making the RPP. As for the supervision carried out by the principal towards the teacher in the preparation of the lesson plan, namely: arouse the
awareness of the teacher in overseeing the preparation of the RPP in order to do a better job in making the RPP. The school principal supervised the course of the activity by assessing and giving input in the preparation of the RPP that was run by the teacher in order to get effective results and provided an assessment of the quality and quantity of teachers.

After doing the data triangulation, the researchers then discussed with colleagues about the supervision of the school principal. The colleagues were the people who understood about supervision with Dr. Masdar Limbong, M.Pd. He stated: In carrying out supervision, it should be done gradually every month so that the teachers’ work can be carried out effectively because it has the nature of time discipline. Giving sanctions to teachers as a warning so that the teachers diligent and active in activities that existed in the school. As for the impact the role of the principal in carrying out supervision was very helpful for the teacher in carrying out his duties.

From the results of data triangulation and conversations with colleagues, researchers believed that the increase in teacher performance was very influential from the results of the supervision of the principal. If supervision was carried out with a strategy that fitted the needs of teachers in Islamic Junior High School of Al-Muslimin, then the teachers’ performance from various aspects would be realized with satisfactory results.

4 Conclusion

Based on the results of the research and discussion previously stated, then in this study it can be concluded that:

a. The strategy of the head of the Islamic Junior High School of Al-Muslimin in improving teachers' performance was by supervising. The techniques in supervision were individual techniques such as class visits, class observations, personal talks and group techniques, namely discussion.

b. The performance of teachers in Islamic Junior High School of Al-Muslimin showed only social aspects while in professional and personal aspects it was not sufficient.

References

The Effect of Polystyrene on Concrete Mechanical Properties

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Abstract. The purpose of this research is to find out the effect of compressive strength, split tensile strength, unit weight, and absorption of concrete by using styrofoam as a partial replacement of volume in concrete and superplasticizer. Comparison of cement and fine aggregate used for concrete mix is 1:2, with cement water factor is 0,25, substitution of superplasticizer for cement is 2%. Variations in the addition of styrofoam to the volume of concrete are 0%, 10%, 20%, 30% and 40% with each of the three samples for testing compressive strength, split tensile strength, weight and absorption. The test specimen used was a cylinder with a diameter of 15 cm and a height of 30 cm. This test is carried out on concrete aged 28 days. The test results of the compressive strength of concrete styrofoam showed the effect of adding styrofoam to the compressive strength of concrete when compared with normal concrete. The maximum maximum compressive and tensile strength occurs with the addition of 10% styrofoam to the volume of concrete which is 22,662 MPa and 4,326 MPa when compared to normal concrete of 24,532 MPa and 4.8 MPa. The minimum content weight and absorption were obtained in 40% of styrofoam substitution to a volume of 1670,484 kg/m³ and 0,36%. Concrete with a substitution of 30% styrofoam with a compressive strength of 18,401 MPa and a weight of 1797,392 kg/m³ can be categorized as structural lightweight concrete.

Keywords: Styrofoam concrete, styrocon, compressive strength, split tensile strength, absorption

1 Introduction

One of building materials that has developed very rapidly until today is concrete. Concrete has many advantages compared to other building materials. The advantages of concrete include the relatively low price, high compressive strength, rust-resistance, easy to be carried and casted, relatively a fire-resistance and no decaying.

But concrete has one disadvantage, which is its specific gravity is high enough so that the dead load on a structure becomes large. Several ways can be used to reduce the specific gravity of concrete, such as not using fine aggregates, the use of light-weight aggregates, and making air pores in concrete. These methods will produce concrete with a specific gravity that smaller than a normal concrete, so it is called a light-weight concrete. The light-weight concrete itself, as the name suggests, focuses on the low weight of the concrete volume, which is 1850 kg / cm³ or smaller [1].
One way to make a light-weight concrete is to use light-weight type aggregates. Alternative materials that can be used is Styrofoam. Styrofoam or expanded polystyrene which is granular in shape, the weight of the unit becomes very small, which only ranges from 13-16 kg/m³ [2].

Styrofoam or expanded polystyrene is known as white cork that commonly used to wrap electronic goods. Polystyrene is a material that is good in terms of mechanics as well as temperature but is rather brittle and soft at temperatures below 100 °C [1]. Polystyrene has a specific gravity of 1050 kg/m³, tensile strength of 40 MN/m², bending modulus of 3 GN/m², shear modulus of 0.99 GN/m², poisson number of 0.33 [4].

The use of styrofoam in concrete can be considered as a trapped air. The advantage of using styrofoam compared to using air cavities in hollow concrete is that styrofoam has a tensile strength and its amount can be controlled [4].

The quality of concrete depends on the type of cement used, the size and quality of the aggregate, the method and duration of mixing, the method and time of compaction, the cement water factor, the concrete treatment and the types of additives used. In this research, superplasticizer is added to improve the workability of concrete to overcome the constraints of the low value of slump. The superplasticizer can be interpreted as a chemical mixture that is used for a high level feasibility and in order to reduce the use of large amounts of water outside the normal limits of plastic mixture.

1.1 Purposes and Benefits

The purpose of this research is to determine the effects of adding styrofoam and superplasticizer to the concrete mixture on the contents weight, absorption, compressive strength and tensile strength of the concrete. The results of this research are expected to be useful as an information about the use of Styrofoam granules in the making of concrete.

1.2 Scope of Problem

The scope of problem in this research are:

1. Materials used:
   a. OPC (Ordinary Portland Cement) or Type I cement produced by PT. PADANG SEMEN in one zak package of 50 kg.
   b. The fine aggregate used is natural sand that passes the No. 4 sieve (4.76 mm).
   c. Variations in the addition of styrofoam to the volume of concrete are 10%, 20%, 30%, and 40%.
   d. Styrofoam used is 3mm - 5mm diameter.
   e. The use of the Masterglenium 8590 superplasticizer from BASF in the mixture.
   f. The water used for the stirring is from PDAM Tirtanadi, at the Construction Materials Laboratory (Concrete), Department of Civil Engineering, Faculty of Engineering, University of Sumatera Utara.

2. Normal concrete used are consist of a mixture of sand, cement, and water.
3. The planned concrete quality is 12 MPa.
4. The ratio used for the concrete mixture is cement: fine aggregate = 1:2, with a substitution of superplasticizer on cement of 2%.
5. The ratio used for the concrete mixture is cement: fine aggregate = 1:2, with a substitution of superplasticizer on cement of 2%.
6. Tests conducted are compressive strength, tensile strength, and absorption.
7. The tests of compressive strength, split tensile strength, content weight, and absorption are conducted when the concrete is 28-days of age.
8. The treatment of samples is by damping which is soaking the samples for 28 days.
9. The sample is a cylinder with a diameter of 15 cm and a height of 30 cm.
10. The use of superplasticizer in the concrete mixture for a high level of workability while suppressing the cement water factor to obtain a high compressive strength of concrete.
11. The cement water factor used is 0.25
12. The number of samples to be made for this research are 45 pieces, with details seen in table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Styrofoam percent age(%)</th>
<th>Superplasticizer substitution(%)</th>
<th>Number of samples for each variation (pieces)</th>
<th>Total (pieces)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3 3 3</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>2</td>
<td>3 3 3</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>2</td>
<td>3 3 3</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td>2</td>
<td>3 3 3</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
<td>2</td>
<td>3 3 3</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td>45</td>
</tr>
</tbody>
</table>

2 Methodology

Concrete is a composite material (mixture) of several materials, whose main material consists of a mixture of cement, fine aggregates, coarse aggregates, water and or without other added ingredients with certain comparisons. Because concrete is a composite, then the quality of concrete depends on the quality of each forming material [3]. According to SNI 2847: 2013, concrete is a mixture of portland cement or other hydraulic cement, fine aggregates, coarse aggregates, and water, with or without admixture. Along with its increasing age, concrete will harden and will reach a planned strength ($f'_c$) at 28 days of age. Concrete has a good compressive strength, therefore concrete is widely used or used for the selection of types of structures, especially the structure of buildings, bridges and roads.

2.1 Light-weight Concrete

One of the innovations conducted in concrete construction is by reducing the specific gravity of the concrete itself. The specific gravity of concrete is 2400 kg / m$^3$, so a light-weight concrete innovations are considered capable of making a smaller specific gravity of concrete.
In other words, light-weight concrete is a concrete that has a lighter specific gravity (density) than a general concrete. Light-weight concrete can be made in various ways, including using light-weight aggregates (fly ash, pumice, shells, etc.), a mixture of cement, silica, pozolan, or cement with an air bubble-producing chemical liquid. The aggregates used to produce a lightweight concrete is also a lightweight aggregate. Basically, light-weight concrete is obtained by adding air pores to the concrete mixture. Therefore, making a lightweight concrete can be done in the following ways [3]:

1. By making gas / air bubbles in concrete mixture. Thus there will be a lot of air pores in the concrete. Special additives (forming air bubbles in concrete) are added to the cement and air bubbles will emerge.
2. By using light-weight aggregates, such as roasted clay and pumice. Thus the concrete that occurs will be lighter than a normal concrete.
3. Making concrete is not with fine aggregates grains. Thus this concrete is called "non-sand concrete" and only made of cement and coarse aggregates only (with a maximum grain of coarse aggregate of 20 mm or 10 mm). This concrete has pores that only contain air (which is originally filled with fine aggregate grains).

The requirements for light-weight concrete are based on compressive strength, content weight, light-weight aggregates types, can be seen in Table 2.2 below.

Table 2. Types of light-weight concrete are based on compressive strength, content weight, and constituent aggregates.

<table>
<thead>
<tr>
<th>Building Constructions</th>
<th>Light-weight Concrete</th>
<th>Types of light-weight aggregates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compressive Strength (MPa)</td>
<td>Content Weight (kg/m³)</td>
</tr>
<tr>
<td>Structural</td>
<td>17.34</td>
<td>1400</td>
</tr>
<tr>
<td>• Maximum</td>
<td>41.36</td>
<td>1450</td>
</tr>
<tr>
<td>• Minimum</td>
<td>11.34</td>
<td>800</td>
</tr>
<tr>
<td>Light-weight structural</td>
<td>0.89</td>
<td>1400</td>
</tr>
<tr>
<td>• Maximum</td>
<td>41.36</td>
<td>1450</td>
</tr>
<tr>
<td>• Minimum</td>
<td>11.34</td>
<td>800</td>
</tr>
<tr>
<td>Extremely Light-weight Structural as an Isolation</td>
<td>-</td>
<td>800</td>
</tr>
<tr>
<td>• Maximum</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>• Minimum</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>


2.2 Styrofoam Concrete (Styrocon)

In making light-weight concrete, one of the additional alternative materials used is Styrofoam. Concrete which is made by adding styrofoam can be called styrofoam concrete or abbreviated as styrocon. This styrofoam is added to the concrete mixture. Styrofoam is commonly known as white cork which is commonly used as a wrapper for electronic goods.
Styrofoam or polysterene foam is a material formed from polysterene by blowing air on polysterene in a hot condition so as to produce a foam with an air content of up to 95% so that the unit weight of styrofoam is quite low ranging from 15-22 kg/m³. Styrofoam concrete is one of the lightweight concrete formed by using light-weight materials in the form of styrofoam granules. Styrofoam concrete can be formed from a mixture of cement, fine aggregates and styrofoam or cement granules, fine aggregates, coarse aggregates and styrofoam granules. Styrofoam added to the concrete mixture can be considered an air cavity. The advantage of using Styrofoam as forming Styrofoam compared to the air intake in concrete is that Styrofoam has a tensile strength and the amount can be controlled [4].

2.3 Content Weight
Regulations concerning the content weight test of light-weight concrete is regulated in SNI 3402-2008 [5]. The content weight of light-weight concrete can be measured in two conditions, which are when the concrete is dry in the oven at a temperature of 110 0C for 24 hours, and the light-weight concrete is balanced, with drying is by using room temperature until the concrete reaches a constant weight.

The content weight of structural light-weight concrete in general in an oven dry condition is calculated using the formula:

\[ Om = \frac{Dg - Gy}{F - G} \text{ (kg/m}^3\text{)} \]  

(1)

Description:
- D : cylinder weight in oven dry condition (kg)
- F : cylinder weight in the saturated surface dry condition (kg)
- G : cylinder weight in water until it is fully submerged (kg)

2.4 Absorption
Absorption is the ability of a material to absorb water. The absorption value is strongly related to the specific gravity and porosity of a material, because a large absorption value indicates the number of cavities contained in the material. Based on SNI 03-6433-2000 [6], the calculation of the amount of water absorption is calculated using the equation:

\[ \text{Abs} = \frac{Mb - Mk}{Mk} \times 100 \% \]  

(2)

Description :
- Abs : absorption (%)
- Mb : the sample weight in water-saturated condition (gram)
- Mk : the sample weight in oven dry condition (gram)

2.5 Compressive Strength
Compressive strength is the ability of concrete to accept compressive forces per unit area. Concrete compressive strength identifies the quality of a structure. The higher the level of strength of the desired structure, the higher the quality of the produced concrete. The reference of concrete compressive strength test is based on SNI 1974-2011 [7]. The compressive strength of the concrete samples is calculated by the formula:

\[ f'_c = \frac{p}{A} \]  

(3)

Description :
- \( f'_c \) : compressive strength (MPa)
2.6 Split Tensile Strength

The test of split tensile (indirect tensile test of concrete) is using a "split cylinder test". By splitting the concrete cylinder, there is a transfer of tensile stress through the plane of the position of one of the cylinders and the concrete cylinder is split along the diameter which is loaded. Cylindrical samples with a diameter of 150 mm and a height of 300 mm, are placed in the longitudinal direction above the tester then the compressive load is given evenly upright from the top to the entire length of the cylinder. If the tensile strength is exceeded, the sample is split into two parts from end to end. This test refers to SNI 03-2491-2002 [8].

The tensile stress that arises when the sample is cracked and split is calculated based on the formula:

\[
f_{ct} = \frac{2P}{\pi DL}
\]

**Description:**
- \(f_{ct}\): concrete fracture stress (MPa)
- \(P\): maximum load (kN)
- \(L\): length of the cylinder (mm)
- \(D\): diameter of the cylinder (mm)

2.7 Research Methods

The method used to analyze the mechanical properties of styrofoam concrete due to the addition of styrofoam and superplasticizer in this research is an experimental study conducted at the Construction Materials Laboratory (Concrete), Department of Civil Engineering, Faculty of Engineering, University of Sumatera Utara.

2.8 Design of Samples

The composition of the mixture consists of sand, cement and styrofoam granules. The samples made in the form of concrete cylinders with a size of 15 cm diameter and 30 cm height are 45 pieces. Styrofoam content in concrete are 10%, 20%, 30% and 40% of the volume of concrete with a level of 2% superplasticizer from the cement weight. Styrofoam used is 3mm - 5mm size of granules. The fine aggregate used consisted of granules that passed the 4.76 mm sieve. The volume composition of cement: the aggregate is 1: 2 and the cement water factor is 0.25.

Variations of the samples are consisted of normal concrete without using styrofoam and superplasticizer which are 9 pieces of cylinders, the concrete that using 10% of styrofoam from the volume of concrete with superplasticizer which are 9 pieces of cylinders, the concrete that using 20% of styrofoam from the volume of concrete with superplasticizer which are 9 pieces of cylinders, the concrete that using 30% of styrofoam from the volume of concrete with superplasticizer which are 9 pieces of cylinders and concrete cylinders that using 40% of styrofoam of the volume of concrete with superplasticizer which are 9 pieces of cylinders.

<table>
<thead>
<tr>
<th>Concrete</th>
<th>Styrofoam (gr)</th>
<th>Cement (kg)</th>
<th>Sand (kg)</th>
<th>Water (l)</th>
<th>Super Plasticizer (l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>-</td>
<td>6,398</td>
<td>10,054</td>
<td>1.6</td>
<td>-</td>
</tr>
</tbody>
</table>
2.9 Flowchart

Fig. 1. Flowchart of the making of concrete with the addition of styrofoam and superplasticizer.

3 Result and Discussion

3.1 Slump Value

The test results of the slump value with the addition of styrofoam and superplasticizer can be seen in Table 4 below.

<table>
<thead>
<tr>
<th>Styrofoam percentage (%)</th>
<th>Slump Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>10</td>
<td>2.0</td>
</tr>
</tbody>
</table>
From Table 4 it can be seen that with the increasing percentage of styrofoam usage is making the slump value is higher, this is due to the use of superplasticizer in the mixture which increases the workability of the concrete. Graphically the effect of using styrofoam and superplasticizer on concrete can be seen in Figure 2.

From the graph it can be seen that the slump value for the percentage of 0% styrofoam is 1.0 cm; 10% of styrofoam percentage is 2.0 cm; 20% of styrofoam percentage is 2.5 cm; 30% of styrofoam percentage is 3.2 cm; 40% of styrofoam percentage is 3.7 cm. The lowest workability occurs in the mixture of 40% styrofoam.

### 3.2 Content Weight

Content weight test is conducted on the 28 days of age concrete. The test is conducted by weighing the concrete in a fully submerged condition. Then the surface is dried to get the SSD condition and weighed the weight. Then the sample is dried in the oven to obtain its dry weight. The test results of the content weight of concrete can be seen in Table 5. The calculations is by using equation (1).

<table>
<thead>
<tr>
<th>Styrofoam percentage (%)</th>
<th>D, (kg)</th>
<th>F, (kg)</th>
<th>G, (kg)</th>
<th>Average Om (kg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>11,272</td>
<td>11,457</td>
<td>6,106</td>
<td>2099,952</td>
</tr>
<tr>
<td>10</td>
<td>10,860</td>
<td>10,975</td>
<td>5,550</td>
<td>1996,062</td>
</tr>
<tr>
<td>20</td>
<td>10,483</td>
<td>10,582</td>
<td>5,198</td>
<td>1941,468</td>
</tr>
<tr>
<td>30</td>
<td>9,737</td>
<td>9,804</td>
<td>4,403</td>
<td>1797,392</td>
</tr>
<tr>
<td>40</td>
<td>9,082</td>
<td>9,114</td>
<td>3,694</td>
<td>1670,484</td>
</tr>
</tbody>
</table>

From the test results of the content weight of concrete, it is found that there is a decrease in the content weight of the concrete along with the increase of styrofoam in the concrete mixture. The addition of styrofoam to the volume of concrete and superplasticizer to cement in the concrete mixture produces a concrete with a lighter content weight. This is due to the content weight of styrofoam which is much smaller than the specific gravity of the sand so a concrete with a lighter volume can be obtained.
From the graph of Figure 3, it can be seen that the content weight of the concrete with a percentage of 0% styrofoam is 2099,952 kg / cm³; 10% of styrofoam percentage is 1996,062 kg / cm³; 20% of styrofoam percentage is 1941,468 kg / cm³; 30% of styrofoam percentage is 1797,392 kg / cm³; 40% of styrofoam percentage is 1670,484 kg / cm³.

The test results show that 10% of styrofoam substitution produced the highest concrete content weight of 1996,062 kg / m³, and the lowest content weight is obtained by substituting 40% of styrofoam which is 1670,484 kg / m³.

3.3 Absorption

Absorption is useful to determine the absorption rate of styrofoam concrete to water. With the amount of percentage of absorption, indicating that the concrete has a large absorption capacity. The test is conducted by weighing the water-saturated weight from the cylinder samples and their dry weight. Concrete absorption test results can be seen in Table 6. The calculation is by using equation (2).

<table>
<thead>
<tr>
<th>Styrofoam percentage(%)</th>
<th>Mk, (g)</th>
<th>Mb, (g)</th>
<th>Average Absorption, (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>11272,000</td>
<td>11457,333</td>
<td>1,642</td>
</tr>
<tr>
<td>10</td>
<td>10860,333</td>
<td>10974,667</td>
<td>1,055</td>
</tr>
<tr>
<td>20</td>
<td>10482,667</td>
<td>10582,000</td>
<td>0,948</td>
</tr>
<tr>
<td>30</td>
<td>9737,000</td>
<td>9804,333</td>
<td>0,691</td>
</tr>
<tr>
<td>40</td>
<td>9081,667</td>
<td>9114,333</td>
<td>0,360</td>
</tr>
</tbody>
</table>

From the test results of concrete absorption, it is found that there is a decrease in the absorption capability of concrete to water along with the increasing styrofoam in the concrete mixture. The addition of styrofoam to the volume of concrete and superplasticizer to cement in the concrete mixture produces a concrete with a smaller absorption, because styrofoam does not absorb water.
From the graph of Figure 4, it can be seen that the absorption of concrete with a percentage of 0% styrofoam is 1.642%; 10% of styrofoam percentage is 1.055%; 20% of styrofoam percentage is 0.948%; 30% of styrofoam percentage is 0.691%; 40% of styrofoam percentage is 0.360%. The decrease in absorption occurs at 35.749%; 42.265%; 57.917%; 78.076% on the variations of styrofoam of 10%, 20%, 30%, and 40%.

3.4 Compressive Strength of Concrete Cylinders

The test of concrete compressive strength is conducted at the 28 days of age to obtain a maximum concrete strength. Concrete cylinders that have reached the age are dried first for 24 hours before the test. Then the samples are weighted for its dry weight, then capped the surface to be able to be compressed. The c is by calculation using equation (3). The test results of the concrete compressive strength can be seen in Table 7 below.

<table>
<thead>
<tr>
<th>Styrofoam percentage</th>
<th>The average weight of samples (kg)</th>
<th>The average compressive load (kN)</th>
<th>The average compressive strength (Mpa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>11,357</td>
<td>433.30</td>
<td>24,532</td>
</tr>
<tr>
<td>10%</td>
<td>10,643</td>
<td>399.67</td>
<td>22,628</td>
</tr>
<tr>
<td>20%</td>
<td>10,430</td>
<td>355.00</td>
<td>20,099</td>
</tr>
<tr>
<td>30%</td>
<td>9,737</td>
<td>325.00</td>
<td>18,401</td>
</tr>
<tr>
<td>40%</td>
<td>9,166</td>
<td>280.00</td>
<td>15,004</td>
</tr>
</tbody>
</table>

From the results of the concrete compressive test it is found that there is a decrease in the compressive strength of the concrete along with the increasing styrofoam in the concrete mixture. The addition of styrofoam to the volume of concrete and superplasticizer to cement in the concrete mixture reduces the ability of concrete to carry compressive forces. This is because the weight of styrofoam is very light, so the presence of styrofoam in a concrete mixture can be considered as an air cavity in concrete. Styrofoam replaces the volume of concrete with a level of 10% to 40% which causes a reduction in mortar mixture in concrete. In other words, the mortar that binds the styrofoam will be smaller in volume as the styrofoam content increases so that the compressive strength of the concrete will decrease.
In general, Figure 5 shows the addition of styrofoam to the volume of concrete resulting in a continuous decrease in compressive strength. From the graph, it can be seen that the concrete without styrofoam has a compressive strength of 24,532 MPa. After the addition of styrofoam by 10% and 20%, 30%, 40%, the compressive strength shows a decrease of 7.761%; 18.07%; 24.992% and 38.839% with a compressive strength of 22,628 Mpa, 20,099 MPa, 18,401 Mpa and 15,004 Mpa.

### 3.5 Split Tensile Strength of Concrete Cylinders

The tensile strength test of styrofoam concrete is conducted on the 28 days of age concrete to obtain the maximum split tensile strength. The cylinder to be tested has been dried 1 day before, then weighed its weight after it is tested by using a splitting test tool. The calculation is by using equation (4). The test results of the content weight of concrete can be seen in Table 8 below.

<table>
<thead>
<tr>
<th>Styrofoam percentage, (%)</th>
<th>The average weight of samples (kg)</th>
<th>Average fracture load (kN)</th>
<th>The average split tensile strength (Mpa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>11,169</td>
<td>108,0</td>
<td>4,800</td>
</tr>
<tr>
<td>10</td>
<td>10,680</td>
<td>97.33</td>
<td>4,326</td>
</tr>
<tr>
<td>20</td>
<td>10,385</td>
<td>90.0</td>
<td>4,000</td>
</tr>
<tr>
<td>30</td>
<td>9,567</td>
<td>86.67</td>
<td>3,852</td>
</tr>
<tr>
<td>40</td>
<td>8,996</td>
<td>80.0</td>
<td>3,556</td>
</tr>
</tbody>
</table>

From the test results of concrete tensile strength at the 28 days of age, the results shows that there is a decrease in the concrete fracture stress in each variations of percentage of the addition of styrofoam. This is caused by the slippery styrofoam surface, so that its attachment to the cement paste is less perfect.
The highest tensile strength is found in the addition of 10% styrofoam which is 4.326 MPa with a decrease of 9.875%. While the lowest split tensile strength is found in the addition of styrofoam at the percentage of 40%, which is 3.556 MPa with a decrease of 25.917%.

4 Conclusion

From the results of the research, analysis, and discussions that have been conducted, it can be concluded as follows:

a. The value of concrete slump with the addition of 0%, 10%, 20%, 30% and 40% styrofoam and 2% of superplasticizers respectively are 1.0 cm; 2.0 cm; 2.5 cm; 3.2 cm and 3.7 cm so that the value of workability of the concrete increases.

b. The addition of styrofoam to the concrete mixture can reduce the weight of the concrete volume due to the light-weight of Styrofoam. The content weight of the concrete is reduced by 14.408% from normal concrete at the addition of 30% styrofoam and 20.451% of normal concrete on the addition of 40% styrofoam.

c. The test results of absorption shows that the addition of styrofoam to the concrete mixture reduced the absorption of concrete against water. The lowest average absorption of the concrete is in a mixture of 40% styrofoam of 0.360%.

d. The test results of concrete compressive strength shows that the addition of styrofoam to the concrete mixture reduced the value of concrete compressive strength. The highest average value of the concrete is found in the 10% mixture of 22,628 MPa.

e. The tensile strength of the concrete with the addition of 0%, 10%, 20%, 30%, and 40% of styrofoam respectively are 4.8 Mpa; 4,326 Mpa; 4.0 Mpa; 3.852 Mpa and 3.556 Mpa.

f. Based on SNI 03-3449-2002, styrofoam concrete with the proportion of styrofoam of 30% with a content weight of 1797,392 kg / cm3 and compressive strength of 18,401 MPa

Suggestions

After looking at the results of the research and being aware of the possibility of deficiencies in this research, the author can provide the following suggestions:
a. The need for a maximum accuracy in the concrete casting work to get the right results and a low level of deviation.
b. Further research is needed on other variables such as permeability, porosity and elasticity of styrofoam concrete.
c. Further research is needed by adding coarse aggregates in the concrete mixture and paying attention to the value of the cement water.
d. Further research is needed with a variety of other pozzolanic / mineral materials (for example: grain husk ash, high furnace crust, fly ash).

References

Strengthening Character Education in Elementary School

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Abstract. The role of education is very vital to form human beings who are intellectually intelligent and characterized. The current character condition of the Indonesian generation is still a self-fear for this nation for the sake of realizing the desired Golden Generation. The easiest character building is when children are still in elementary school, called the Golden Age, in this period children are more easily formed. Strengthening Character Education in Elementary Schools is very important as the foundation for the cultivation of the nation's character, so that when the time of 100 years of Indonesian independence comes, the generation of gold aspired by the State of Indonesia will be born as expected, the devoted, nationalist Golden Generation, strong, independent, and has a competitive advantage globally. In order to prepare the Golden Generation of 2045, the government strengthens the character of the young generation through Strengthening Character Education. Strengthening Character Education can be done through three approaches, namely class-based, school-based, and community-based.

Keywords: Character education, elementary school, gold generation

1 Introduction

Indonesia will be heading for the second revival which is the nation's 100-year long journey in 2045. This is one of the reasons for the emergence of Golden Generation 2045 ideas. The golden generation is a generation that is able to compete globally with a comprehensive and superior civilized intelligence. This is the biggest hope of the Indonesian people in 2045 in the effort to realize the golden generation.

The echo of the Indonesian Golden Generation is increasingly echoing across the country and giving a sense of optimism because at the same time Indonesia will experience a demographic bonus where the highest population of productive age is between the ages of children and the elderly. By 2045, Indonesia's demographic bonus is Indonesia's 70% population in the productive age (15-64 years), while the remaining 30% are unproductive population (under 14 years and over 65 years) in the period of 2020-2045 (BKKBN, 2017). Like the two sides of a bonus demographic currency, it can be demographic dividend if the government provides careful and periodic monitoring and handling.

On the other hand, of course this demographic bonus can lead to disaster (disaster demographic) if the demographic bonus is not used properly. Especially social problems such as poverty, low health, unemployment, and high crime rates. To prepare for the golden generation of 2045, the role of education is vital to form human beings who are intellectually intelligent and characterized. Therefore, education needs to change the mindset that can be
interpreted that education is not only about knowledge transfer but is equipped with character. This academic balance with character needs to be prepared early.

Character is the main element of quality human beings. Sukidi (2005: 4) says that the phenomenon of the life crisis (character crisis) is not solely an intellectual and moral crisis, but a little deeper into the heart of the problem that the moral crisis that almost penetrates our entire life line actually originates and leads to a spiritual crisis. This means that the crisis character is not just losing 18 traits, but character education is far more fundamental, namely the functioning of conscience (SQ).

The current character condition of the Indonesian generation is still a self-fear for this nation for the sake of realizing the desired Golden Generation. How come? Based on data from the Indonesian Child Protection Commission in 2015 that cases of children as perpetrators of violence are increasing. In 2014 there were 67 cases of children who became perpetrators of violence while in 2015 it increased to 79 cases. The case of children as brawlers also increased. In 2014 there were 46 cases, in 2015 there were 103 cases. Meanwhile, the Bali Provincial Commission for the Protection of Regional Children revealed that 253 children in Bali were faced with law throughout 2017 both as victims and as perpetrators, out of which 137 children were perpetrators of crime, theft and involvement of motorcycle gangs.

Child crime data in the previous paragraph shows indirectly the character of the nation's children who have been damaged. The data above shows the alarming condition of the character of the young generation of the Indonesian people. The hope of welcoming the Golden Generation in 2045 is not something that is not just mere discourse. This problem is a very complicated problem that requires handling directly, quickly and accurately.

Talking about character planting is never separated from the world of education. The Ministry of Education and Culture launched the Character Education Movement for all levels of education from elementary school to high school. The easiest character building is when children are still in elementary school, called the Golden Age, in this period children are more easily formed. In addition, elementary school is the beginning of formal education obtained by a child as well as the beginning of his formation. So, planting good character in elementary school age is very important to do.

Based on the background of the above problems, the problem that will be discussed in this article is "What is the Application of Strengthening Character Education in Primary Schools as the Foundation of Indonesian Gold Generation 2045?". The purpose of writing this article is to provide an overview of the application of Strengthening Character Education in Elementary Schools as a Foundation for Forming Indonesian Gold Generation 2045.

2 Methodology

2.1 Strengthening Character Education in Primary Schools

Implementation of Strengthening Character Education in the nation's generation is carried out in formal education. Elementary School as the most basic formal education in implementing this character education. Strengthening Character Education in Primary Schools is very important as the foundation for the cultivation of the nation's character, so that when the time of 100 years of Indonesian independence comes, the generation of gold aspired by the State of Indonesia will be born as expected, the devoted, nationalist Golden Generation, strong, independent, and has a competitive advantage globally. Robert J. Havigurst (1961)
argued about the task of individual development, which is a task that appears in a certain period in an individual's life that must be faced, mastered, and resolved properly, if the development task is not completed properly it will impact unhappiness in development next. Havigurst stated that developmental tasks related to character building existed between 6 - 12 years (elementary school age), namely the development of a holistic attitude, the development of morals, values, and conscience.

Sutirna [1] states that at the age of 6 years to adolescence boys and girls behave according to what is expected by the group. Moral values or rules are largely determined by the norms in the group environment. At the age of 10 to 12 years children can know the reasons or principles underlying the rules. His ability has developed so as to be able to distinguish various kinds of moral values and connect the concepts of morality regarding honesty, property rights, justice, and honor. While when a child approaches adolescence, the child has developed moral values as a result of his moral experience during elementary school.

Ministry of Education and Culture said character education is a very important key in shaping the child's personality. Besides at home, character education also needs to be implemented in schools and social environments. In essence, education has a purpose to help people become smart and grow into good people. In order to prepare the Golden Generation of 2045, the government strengthens the character of the young generation through Strengthening Character Education. The easiest character building is when children are still in elementary school.

Based on some of the opinions above, it can be concluded that the Strengthening of Character Education is very important to do at the age of elementary school as a strong foundation to form the Golden Generation in 100 years of independent Indonesia. Character building at the age of elementary school becomes the beginning that must be done so that the generation of the nation that will be born into a generation that has religious values, nationalist, independent, mutual cooperation, and integrity.

3 Result and Discussion

3.1 Implementation of Strengthening Character Education

Strengthening Character Education implementation is not carried out specifically for one subject. Strengthening Character Education can be done through three approaches, namely class-based, school-based, and community-based. Class-based Strengthening Character Education implementation is done by integrating in activities carried out in the classroom. Class-based can be done in several ways, namely:

a. Integrating Strengthening Character Education into The Curriculum

Integrating Strengthening Character Education into the curriculum implies that educators integrate Strengthening Character Education core values into the learning process in each subject. Learning that integrates the main values of the character is intended to foster and strengthen knowledge, instill awareness, and practice the main values of Strengthening Character Education.

b. Strengthening Character Education Through Class Management

Classroom management is an educational moment that places the teacher as an authorized individual and has the autonomy to manage the learning process. Educators have the authority to prepare (before entering class), teach and after teaching, by preparing learning scenarios that focus on the main values of the character. For example: students become
good listeners or listen when the teacher explains in the classroom (can strengthen the value of mutual respect and tolerance), students raise their hands before asking the teacher and asking questions after being allowed by the teacher (can strengthen the value of mutual respect and trust self), giving sanctions that educate as a consequence and form of responsibility if there is a delay in doing or collecting tasks (can strengthen the value of discipline, responsibility and self-commitment), teachers encourage students to do peer tutoring (can strengthen the value of mutual cooperation, social care, confident, and responsible).

c. Strengthening Character Education through Choices and Use of Learning Methods
Some learning methods that teachers can choose to integrate character education in learning, namely: scientific learning methods, inquiry methods, problem-based learning methods, project-based learning, cooperative learning methods, text-based learning methods.

d. Strengthening Character Education Through Thematic Learning
The education unit designs its own themes and priorities for what character education will emphasize. Strengthening Character Education through thematic learning is learning activities carried out by education units by allocating specific time to teach certain values.

e. Strengthening Character Education through literacy movements
Literacy movement is an activity to hone the ability to access, understand, process, and utilize information critically and intelligently based on the activities of reading, writing, listening, and speaking to develop one's character to be strong, strong and good. Each teacher can invite students to read, write, listen, and communicate carefully, carefully, and precisely about a theme or topic that exists in various sources, both books, newspapers, social media, and other media.

3.2 Strengthening Character Education Culture Based
Strengthening Character Education based on school culture focuses on habituation and cultural formation that represents the main values of Strengthening Character Education that are the priority of education units. This habituation is integrated in all activities in the school which are reflected in the conducive atmosphere and school environment. School culture-based Strengthening Character Education begins with determining the main value of Strengthening Character Education, namely the school determines the main values that will be the focus in developing character building and strengthening in the school environment. The selection of key values is discussed, discussed, and dialogue with all school stakeholders (principals, educators, education staff, school committees, and students). Steps for implementing culture-based Strengthening Character Education in schools can be carried out by:

a) Arrange a daily/weekly schedule
The education unit can arrange a daily/weekly activity schedule to strengthen the main Strengthening Character Education values that have been chosen as a habituation and integrated strengthening effort.

b) Evaluation of school regulations
Every educational institution is obliged to make corrections and evaluations of various regulations that they have and harmonize with the main values of Strengthening Character Education who want to be directed. One example of a regulation that must be evaluated is the discipline regulation regarding illness, permit, and negligence, the application of minimum completeness criteria policy, and regulations related to cheating activities.
c) Development of school traditions
The education unit can develop Strengthening Character Education based on school culture by strengthening the traditions that are already owned by the school.

d) Development of kokurikuler activities
The kokurikuler activity is carried out through a series of assignments that are in accordance with the target of achieving the competence of each subject that is relevant to intracurricular activities. The types of activities are in the form of tasks, both individually and in groups. For example, it can take the form of project activities, research, practicum, observations, interviews, art exercises, and sports, or other productive activities.

e) Extracurricular (compulsory and optional)
Strengthening the main values of Strengthening Character Education is made possible through extracurricular activities. There are two types of extracurricular activities, namely compulsory extracurricular (scout education) and choice extracurricular (according to the extracurricular developed by each education unit). All extracurricular activities developed must contain and confirm the character values developed in each form of activity carried out.

Community Based Strengthening Character Education Various forms of collaboration and collaboration between communities and education units outside of school are needed in strengthening character education. The forms of collaboration include:
(a) Museum-based learning, cultural heritage and art studios.
(b) Mentoring with local artists and cultural observers.
(c) Inspiration class.
(d) On-air radio broadcast program.
(e) Collaboration with television media, newspapers and magazines.
(f) Literacy movement.
(g) Digital literacy.
(h) Collaboration with universities; Lecturer Research.
(i) Cooperation with religious communities.

4 Conclusion

Education is closely related to the golden generation of Indonesia because education is the key to bringing reliable human resources and can change attitudes and increase one's knowledge.

The Indonesian gold generation is the current generation that is provided for future generations in making Indonesia a more developed country. To be able to accompany other developed countries, we need to prepare a golden generation of Indonesia by strengthening character education for students through formal education and as early as possible so that Indonesian education products will be born, namely students with character, devotion, toughness and global competitiveness.

Acknowledgements
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References


A Preliminary Study of Peat Gasification Characteristics in an Improved Biomass Stove

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Abstract. The purpose of this research was to assess the ability of peat as fuels based on improved stove gasification. The stove was designed and fabricated refer to numerous stoves used by researchers and used as the appliance for validation. The stove tested was the forced draft types with a battery mini fan-assisted and a mini blower to force the controlled air for gasification requirement. Flame temperature was recorded and displayed using K-type thermocouple and thermometer indicator respectively. The laboratory operating parameter used was the equivalence ratio (ER) in the ranges of 0.2-0.45. Three peat sizes different in diameters were considered to study the effect of ER on the flame temperature as the thermal power indicator of the peat. From the test results, it was found that the flames temperature was in the ranges 600-700 oC. Peat with moderate diameter sizes (about 3 cm) was achieved higher flame temperature about 680 oC with ER was about 0.34.

Keywords: Energy alternatif, biomass, peat, stove, combustion, gasification

1 Introduction

Due to the uncertainty of global price of the main fuel from year to year, and also the negative impact of greenhouse gas emission on the environment, a lot of rural residents forced uses a huge amount solid fuel such as biomass and wood charcoal as fuel. Usually simple stoves are widely used as combustion appliance with a number of wasteful weaknesses in the use of solid fuels and also harmful air pollution. However, as technology continues to grow, solid fuel direct combustion methods using conventional three stones stoves have been abandoned and switch to the developed and improved stoves based on gasification.

In contrast to conventional three-stones, an improved stove design brings the thermal process of solid fuel near-stoichiometric operation to maximize thermal efficiency and minimize emissions, limits the velocities in the core of the stove as processing zone to limit particle carry-over with vessels of practical relevance was developed and well engineered using principles of gasification with air supply from battery assisted mini-fan and offer efficiency of ranged from 40% to 60%.

Some improved stoves have been studied and are used for biomass conversion equipment [11]-[14],[21]. However, the information of peat gasification based on stove is still rare. Referring to the potential of renewable energy sources, in addition to biomass, peat (peat soil) is considered as renewable [16] but is not considered as biomass[20]. Peat is also available in abundance and has the potential as a fuel to replace wood charcoal and other fuels. Peat is known to be one of a competitive solid fuel based carbonaceous content as an alternative
energy source. It is the lowest class of coal consisted of 54.5% C, 5.1% H, 1.65% N, 0.45% S, 33.09% O and 5.2% Ash with the High Heating Value of 21.230 kJ/kg [1].

At this time, attention has been paid to upgrade the peat value based on heat energy content. In Indonesia, considerably effort have been made, however this effort increased slowly but surely. Thermal energy from peat can be upgraded by gasification instead of conventional direct combustion using an improved biomass stove. Gasification is well known as the most attractive process to biomass solid fuel due to less pollutant generation.

As one of the advantages uses of peat as fuel, it can reduce the risk of land fires which are usually occures in every dry season. Wildland actually very harmful and causes the carbon loses during fires. Another advantage is the restoration of peatlands which is useful for maintaining the sustainability of peat soil production. The use of peat is also helpful for mitigation to the global warming[6].

Indonesia has around 17 million hectares of peat land (10% of Indonesian’s area) and is spread throughout Sumatra, Kalimantan and Papua. Sumatera especially South Sumatra has the peatland about 1,4 million hectares and has not been utilized optimally. In general, peat can be used for household purposes in terms of energy sources. One of the most interesting of the peat disadvantages when processed using three-stone fire is the particles emission due to high ash content and has a significant effect on global warming than biomass.

By using an improved stove based gasification, 90% of the particulate matter can be reduced[15]. Indonesian peat has higher emission factor compare to wood[5][10]. Therefore, peat better gasify in combined or co-firing with another solid fuels [6][20] to reduce the particles emission. Considering that peat soil does not have a specific shape and size, in addition to the many water content constraints, its use is constrained in size. A study shows that the presence of peat and the energy it produces is beneficial for household needs by making its shape into briquettes [9].

This study focused on evaluating the ability of peat as thermal energy source-based biomass stove gasification. Specific objective is to obtain the parameter that suitable to convert the peat via gasification into flameable products gas. Forced draft biomass stoves type is used in this study. Good mixing of air with product gases and can result in complete combustion in addition to low emissions are the advantages of this stove compare to open three stones. This stove is also well known as an attractive devices due to its small sizes. The stove is made of thin plate material. The stove working principle is the force draft type based like most used by another researcher where a controlled air for gasification needed is supplied by a mini battery fan and a mini blower[22].

2 Methodology

2.1 Materials

This study investigated the viability of raw peat as an alternative fuel in rural area. Peats were collected from Dolok Sanggul district in the North Sumatera, 400 km from Medan. Peat samples were collected and naturally dried under the sunlight to remove water as much as possible before using as feedstock. Usually the water content of the peat was approximately 11% after drying[10]. The peat was formed manually nearly to spherical shape with diameter ranged from 1 to 3 cm.
2.2 Method

2.2.1 Stove design and prototype

The stove was fabricated at mechanical engineering workshop, engineering faculty, Universitas Negeri Medan. The stoves picture schematic diagram can be seen in Fig and its prototype is shown in Fig. The manufacture of the stove was made using thin plate materials and referring to theoretical design by[17]. This developed stove offers efficient applications, which make user friendly and sustainable in the rural society. The emissions from this stove are quite low, portable and can be operated indoors.

There are two air holes in this stove; the primary and the secondary air holes. The primary air directly supplied into the stove from the bottom side to gasification section and the secondary air is added from the slightly below upper side for product gas combustion. The peat was feed from the top of the stove just above the grate. This type of stove was generally named, the “Turbo Stove”[19].

An important parameter to operate this stove which based on gasification is the equivalence ratio (ER) aspect. According to [23] in their work, they used ER for biomass based wood gasification in downdraft reactor in the range 0.268–0.46. The ER is a very important criterion for solid fuels since there is only one theoretical value that produces maximum flame temperature and minimum emissions. Mini fan and blower were performed to supply the air required for gasification in to the stove. The product flameable gases meets with oxygen at the top side and burnt produced hot flame.

2.2.2 Experiment procedures

In initiating the operation of this stove, certain of charcoal and kerosene were used to speed up the peat’s ignition time. The peat was considered well-lit when it’s colour was visually observed fully red. Afterwards peat with diameters ranged from 1-3 cm are fed into the stove precisely above the grate. If longer time for testing is required, additional peat can be fed from the top of the stove. The time required for initial ignition should be as short as possible until the stove generated flame. After the fire arises from the stove, the experimental process begins, the fan air supply was turned on and the air flow was measured using anemometer.

The flame temperature during test-run is measured using a K-type thermocouple, viewed and recorded using a digital temperature indicator. Through the flame temperature and its colour, it can be possible to know the peat ability as the fuel. To evaluate the performance of the stove, the modified water boiling test (WBT 4.2.3) version was performed due to the lack of the instrument in the laboratory. This method performs well under some of difference in biomass and stove geometry. This protocol was also used by a number of researcher to evaluate their biomass fired stove[4][8][13][18]. The performance parameters studied in this work are thermal efficiency, specific fuel consumption and also the thermal output of the stove.

In this study, the peat tested assumed has a uniform sizes and diameter ranged from 1 to 3 cm in accordance with [2] and well dryed using solar thermal for 3 to 5 days. The amount of peat fuels used is measured using a digital scale. After flame arises and observed stable, 1 liter of water at ambient temperature in the pot is placed on the stove above of the support part. The stove condition for starting began from ambient temperature. Testing model refer to ambient temperature is called as the cold-start phase. The flame and the time during the operation is well recorded using K-type thermocouple after water get boiled. After that the fan is switch off and let the stove to cool down. The rest peat, water, and the ash after testing are weighed
which used to calculate the stove efficiency. Efficiency is one of the most important parameters in the solid fuel testing. The transfer of energy from the fuel to the pot must be as high as possible. But the estimation of heat transfer in the stove is very complicated. In this study the efficiency of the stove is estimated using the principle of mass balance.

![Fig. 1. Top-lit forced draft gas stove schematic diagram (in cm)](image1)

![Fig. 2. The stoves prototype](image2)

### 3 Result and Discussion

The Turbo Stove studied in this project has been satisfactorily operated. Understanding the operation of the stoves tested has been achieved through the visual observations of the flames colour and temperature profiles during running-test. The stoves flame observed during experiment can be seen as shown in **Fig.** It has been observed that the stove burns continuously for 32 minutes. Clearly, the peat ability can be categorized valuable based on flames colour and the temperature. The flame temperature is in the ranges of 600-700 °C slightly below the temperature flame of wood gas[18]. The higher the flame temperature indicated higher thermal power output of the stove. The flame temperature obtained in this study is similar to the flame temperature-based stove by another researcher.

**Fig** shows the temperature profile of the flame during test run. It can be seen that the flames temperature varies with equivalence ratio and the peats diameter. It was found that for all three peats sample in this study, the flame temperature increases with increases equivalence
ratio up to about 0.34 and than start to decrease. This condition is in accordance with the gasification theory where gasification occurs in the ER ranges between 2 to 3\(^2\). However, in the higher the ER, the flameable gases product starts to decrease because the thermal process in the stove become closer to the combustion process where all gasses tend to burn due to excess air and high temperatures in the stove. For good gasification, the air requirement is only a fraction of stoichiometric amount and below that the process becomes pyrolysis process that produces bio-oil instead of fuel gasses.

It was found that the peat with moderate diameter size (about 3 cm) was achieved higher flame temperature about 680 \(^\circ\)C with ER was about 0.34 during peak hour of the test run and than decrease. In this condition, the ability of the peat can also be observed through the colour of flame shown. This result is confirmed by the previous research through wood gasification in downdraft gasifier attain the higher Carbon monoxida and Methane content in the syngas on ER about 0.36\[^2\].

![Fig. 3. The stove flame photographic in operation](attachment:stove_flame.png)

The decrease in the temperature with ER is due to decrease in the production of combustible gases. Generally, by increasing the ER, the process close to combustion, so that apart of the gases burnt completely before meet the secondary air at the top to be burnt.

![Fig. 4. Temperature profile of peat gasification](attachment:temperature_profile.png)
Thermal efficiency of the stove using peat in this study is found approximately 23.7%. This is similar with another researcher found [18] confirmed by the thermal efficiency of biomass close to 27%[3]. The specific fuel consumption and the thermal output power obtained are quite comparable with previous findings on biomass gasification based on stove. The results were carefully consulted to the standard protocol WBT under numerous works.

In this study, performance of the stoves was evaluated by using the water boiling test (WBT). This protocol was also used by a number of researchers to evaluate their biomass fired stove [13]|18]. The findings in this work were a lot of similar with other results founded by researchers.

4 Conclusion

A study on increasing value of abundant energy sources of peat was performed based on laboratory conditions. An improved biomass stove was used to assess the ability of this solid fuel to respond and reduce dependence on fossil fuel and to help mitigation on environmental. The product flameable gas generated during process was combusted to observe the ability of this fuel based on temperature flames. High temperature about 680 °C can be achieved from the peat with ER was about 0.34. High temperature indicated that the peat can be used as an alternative energy source especially in rural areas. An argumentative conclusion can be drawn from this work that the peats have highly potential energy sources that must be further developed.

References


Value Engineering Implementation on Construction Project of Suzuya Plaza, Tanjung Morawa

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Abstract. A construction project can’t be separated from costs, time, human resources and natural resources. Every project implementer always wants to be able to complete a construction project at the most economical cost possible. But this must be done with techniques that have been tested for success. The cost saving technique used must still pay attention to the quality, reliability and usefulness of a building that is being worked on. One of the saving techniques that have been tested for success is value engineering. In an alternative selection, an analysis of the advantages and disadvantages of the ideas obtained in the creative stage is carried out. The assessment factors carried out on the alternatives to be chosen are initial costs, aesthetics, implementation time, level of implementation, durability, level of comfort, and level of environmental friendliness. The alternative chosen is an alternative that has the highest assessment results in the analysis stage, then calculating the costs required in the next stage. Work items that have the highest costs are on roof work with a total initial cost of Rp. 434,560,000.00. After value engineering carried out, it is obtained that the selected alternative is using 0.35 mm zincalume roof with a savings of Rp. 183,123,584 of the initial cost. The savings is around 3.6% of the total cost of the analyzed structure. Thus, one of the objectives of value engineering application which is cost savings is achieved.

Keywords: Value engineering, cost savings, construction project

1 Introduction

A construction project can’t be separated from costs, time, human resources and natural resources. Every project implementer always wants to be able to complete a construction project at the most economical cost possible. But this must be done with techniques that have been tested for success. The cost saving technique used must still pay attention to the quality, reliability and usefulness of a building that is being worked on [1]. If it is done without proper analysis, it will cause something harmful to project implementers and building users. Therefore, the implementer must do a good management in the construction project.

P In a construction project, an evaluation can still be carried out which aims to get a more optimal and maximum results while still paying attention to the quality and performance function of a building that in accordance with the plan, which is by doing Value Engineering [2]. Value engineering is a proven management technique that uses a systematic approach system by a group (team) that is directed to analyze the function of an item or system, product, facility, project, or service in order to achieve the required function with the most minimum
total cost, being consistent with the provisions for appearance, reliability, quality and maintenance of items or systems, products, facilities, projects or services. [3].

The implementation of value engineering is expected to know the most optimal costs that aim to get savings but still pay attention to the quality, reliability and main function of a building [4]. So that construction service providers can still compete better in the world of construction.

The purposes of this research are to find out what work that can be optimized, and to find out how much savings are obtained.

2 Methodology

The methods used in this study are the stages of value engineering. These stages include: Information stage; Creative stage; Analysis stage; Development stage; Presentation stage.

2.1 Information Stage

Collecting information thoroughly about a project that will be studied. Perform a pareto analysis to get the highest cost of work items, then proceed by making a breakdown cost table. After that, a diagram of Functional Analysis System Technique (FAST) is drawn and performs a function analysis on high cost work items that have a value of cost/worth > 1.

2.2 Creative Stage

A stage to bring up as many creative ideas as possible while still referring to the desired functions that have been determined and evaluated. Can be started by describing a general or conventional things up to the methods that follow the developments that occur.

2.3 Analysis Stage

Analyzing the advantages and disadvantages by providing an assessment of creative ideas obtained. Factors assessed are the initial costs, aesthetics, implementation time, level of implementation, level of durability, level of comfort, and friendliness of the environment [5]. The alternative chosen is the one that has the highest assessment results.

2.4 Development Stage

Calculating the costs needed to replace the initial design with the alternatives that have been selected at the analysis stage [6]. An alternative that resulting cost savings will be proposed at a later stage.

2.5 Presentation Stage

Presenting selected alternative results in the form of graphs resulting from the analysis of the advantages and disadvantages to be easily understood.

3 Result and Discussion

3.1 Information Stage

The information of works items can be seen at the tabel below.
The distribution law of Pareto states that 80% of the total costs incurred in 20% of work items will be analyzed later. From the graph above, it can be stated that work items that can be applied in the implementation of value engineering is on the 2nd floor, 3rd floor, ground floor, roof, column, and rafter.

Then detailing the costs that will be further analyzed which is part of the work items that meet Pareto analysis (Table 2).

![Pareto's Law](image-url)
### Table 2. Breakdown cost

<table>
<thead>
<tr>
<th>No.</th>
<th>Work Items</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Double plate tin roof (galvalum roof+insulation+ wavy roof)</td>
<td>434,560,000</td>
</tr>
<tr>
<td>2</td>
<td>U39 Concrete iron (3&lt;sup&gt;rd&lt;/sup&gt; floor beam)</td>
<td>399,847,520</td>
</tr>
<tr>
<td>3</td>
<td>U39 Concrete iron (2&lt;sup&gt;nd&lt;/sup&gt; floor beam)</td>
<td>372,332,290</td>
</tr>
<tr>
<td>4</td>
<td>Floordeck Formwork t=0.75 TCT (0,70 BMT) ex. Cordekk (2&lt;sup&gt;nd&lt;/sup&gt; floor plate)</td>
<td>286,727,350</td>
</tr>
<tr>
<td>5</td>
<td>Floordeck Formwork t=0.75 TCT (0,70 BMT) ex. Cordekk (3&lt;sup&gt;rd&lt;/sup&gt; floor plate)</td>
<td>280,525,700</td>
</tr>
<tr>
<td>6</td>
<td>Formwork (3&lt;sup&gt;rd&lt;/sup&gt; floor beam)</td>
<td>279,511,717</td>
</tr>
<tr>
<td>7</td>
<td>Formwork (2&lt;sup&gt;nd&lt;/sup&gt; floor beam)</td>
<td>269,618,705</td>
</tr>
<tr>
<td>8</td>
<td>CNP 150x50x20x3.2</td>
<td>254,160,930</td>
</tr>
<tr>
<td>9</td>
<td>K250 Concrete (2&lt;sup&gt;nd&lt;/sup&gt; floor plate)</td>
<td>250,981,500</td>
</tr>
<tr>
<td>10</td>
<td>K250 Concrete (3&lt;sup&gt;rd&lt;/sup&gt; floor plate)</td>
<td>245,553,000</td>
</tr>
<tr>
<td>11</td>
<td>WF 400x200x8x13</td>
<td>223,938,000</td>
</tr>
<tr>
<td>12</td>
<td>K250 Concrete (3&lt;sup&gt;rd&lt;/sup&gt; floor beam)</td>
<td>218,241,975</td>
</tr>
<tr>
<td>13</td>
<td>K250 Concrete (2&lt;sup&gt;nd&lt;/sup&gt; floor beam)</td>
<td>209,392,785</td>
</tr>
<tr>
<td>14</td>
<td>WF 200x100x5.5x8</td>
<td>150,842,340</td>
</tr>
<tr>
<td>15</td>
<td>U39 Concrete iron (1&lt;sup&gt;st&lt;/sup&gt; floor column)</td>
<td>148,989,742</td>
</tr>
<tr>
<td>16</td>
<td>WF 450x200x9x14</td>
<td>116,371,200</td>
</tr>
<tr>
<td>17</td>
<td>U39 Concrete iron (2&lt;sup&gt;nd&lt;/sup&gt; floor column)</td>
<td>107,099,635</td>
</tr>
<tr>
<td>18</td>
<td>WF 350x175x7x11</td>
<td>104,427,840</td>
</tr>
<tr>
<td>19</td>
<td>Hebel Couple (3&lt;sup&gt;rd&lt;/sup&gt; floor)</td>
<td>98,028,000</td>
</tr>
<tr>
<td>20</td>
<td>U39 Concrete iron (1&lt;sup&gt;st&lt;/sup&gt; floor skoof)</td>
<td>96,782,519</td>
</tr>
<tr>
<td>21</td>
<td>Stucco + Acian (3&lt;sup&gt;rd&lt;/sup&gt; floor)</td>
<td>96,067,440</td>
</tr>
<tr>
<td>22</td>
<td>Stucco + Acian (2&lt;sup&gt;nd&lt;/sup&gt; floor)</td>
<td>88,878,720</td>
</tr>
<tr>
<td>23</td>
<td>Wiremesh M5</td>
<td>86,980,100</td>
</tr>
<tr>
<td>24</td>
<td>Wiremesh M5</td>
<td>86,980,100</td>
</tr>
<tr>
<td>25</td>
<td>Wiremesh M7</td>
<td>86,442,720</td>
</tr>
<tr>
<td>26</td>
<td>WF 450x200x9x14</td>
<td>85,956,000</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td></td>
<td><strong>5,079,237,828</strong></td>
</tr>
</tbody>
</table>

Figure of FAST diagram on the reviewed work items

![FAST Diagram of roof work](image-url)
Next, analyzing the function of the reviewed work items. Based on the results of the cost / worth analysis carried out on the roof work, wall work and floor plate work, they have a value
of cost / worth > 1, which means that there are unnecessary costs and value engineering can be carried out.

3.2 Creative Stage

The creative ideas obtained are:

**Table 3. Roof work’s alternative**

<table>
<thead>
<tr>
<th>No.</th>
<th>Alternative Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>A0</td>
<td>Early Design : double plate tin roof (galvalum+insulation+wave tin)</td>
</tr>
<tr>
<td>A1</td>
<td>0.35 mm Zincalum Spandek+ aluminium voil</td>
</tr>
<tr>
<td>A2</td>
<td>Galvanized + aluminium voil</td>
</tr>
</tbody>
</table>

**Table 4. Floor plate work’s alternative**

<table>
<thead>
<tr>
<th>No.</th>
<th>Alternative Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>A0</td>
<td>Early Design : readymix reinforced concrete + wiremesh iron</td>
</tr>
<tr>
<td>A1</td>
<td>Precast concrete + wiremesh iron</td>
</tr>
<tr>
<td>A2</td>
<td>Reinforced Concrete (manual) + wiremesh iron</td>
</tr>
<tr>
<td>A3</td>
<td>Galvanized Bondek Structural Steel Floor Sheets</td>
</tr>
</tbody>
</table>

**Table 5. Wall work’s alternative**

<table>
<thead>
<tr>
<th>No.</th>
<th>Alternative Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>A0</td>
<td>Early Design : Brick Wall, Stucco + Acian</td>
</tr>
<tr>
<td>A1</td>
<td>Partition Wall, Gypsum</td>
</tr>
<tr>
<td>A2</td>
<td>Brick wall, Aluminium Composite Panel (ACP), aluminium hollow frame</td>
</tr>
<tr>
<td>A3</td>
<td>Kalsipart Wall 8, metal frame</td>
</tr>
</tbody>
</table>

3.3 Analysis Stage

After analyzing the alternative 1 advantages and disadvantages, the roof work has the highest total assessment results in terms of initial costs, aesthetics, implementation time, level of implementation, level of durability and comfort, and environmental friendliness.

3.4 Development Stage

In the development stage, the cost calculation for alternative 1 is carried out which is Zincalume Roof 0.35 mm + aluminum with a total cost of Rp. 251,436,416 which means obtained cost savings of Rp. 183,123,584 with an RAB of Rp. 434,560,000. On the wall work, the alternative cost chosen is Rp. 273,715,960 while the initial cost is only Rp. 633,276 which means no savings are obtained. And on the floor plate work, the alternative cost generated which is Rp. 790,692,350 with an initial cost of Rp. 748,429,529 is also did not get savings.
3.5 Presentation Stage

Displaying the results of analysis of the advantages and disadvantages in graphical form. In the results of analysis of the advantages and disadvantages of roof work, an alternative that gets the highest rating compared to other alternatives and with the initial design is the alternative of zincalume roof 0.35 mm + aluminum voil (Figure 5).

![Fig.5. Graph of roof work analysis results](image)

In the analysis of the advantages and disadvantages of floor plate work, the alternative that gets the highest rating compared to other alternatives and with the initial design is the alternative of bondek galvanized structural steel floor sheets (Figure 6).

![Fig.6. Graph of plate work analysis results](image)

In the results of the analysis of the advantages and disadvantages of wall work, the alternative that gets the highest rating compared to other alternatives and with the initial design is on the alternative of kalsipart wall 8 (Figure 7).
4 Conclusion

From the results of the value engineering analysis on the construction project of Movie Theater of Suzuya Plaza of Tanjung Morawa, it can be concluded that:

First, work components that can be carried out by value engineering analysis are on roof work, beam work, column work, floor plate work, and wall work.

Second, the alternative chosen for each work is an alternative that has the highest value from the results of advantages and disadvantages analysis in terms of initial costs, aesthetics, implementation level, durability level, comfort level, and level of environmental friendliness.

Third, the cost of savings obtained on roof work which is the highest cost work item is Rp. 183,123,584 with an RAB of Rp. 434,560,000. The savings obtained is 3.6% of the initial cost of the analyzed structural work, which is Rp. 5,079,237,828. Whereas in other work items after being analyzed, the cost does not get cost savings so it is not proposed to replace the initial design.

Suggestions

The implementation of value engineering on construction project of movie theater of Suzuya Plaza of Tanjung Morawa should be carried out in the early stages of the project to get a more optimal savings results.

References


The Effect of Organizational Culture, Principal Leadership, and Job Satisfaction to Teachers’ Organizational Commitment in The Public Vocational High School of Sibolga City

Jailani Tumanggor

Abstract. This study aims to describe and find out: (1) The Effect of Organizational Culture on Job Satisfaction; (2) Effect of Principal Leadership on Job Satisfaction; (3) Effect of Organizational Culture on Organizational Commitment; (4) Effect of Principal Leadership on Organizational Commitment; and (5) Effect of Job Satisfaction on Organizational Commitments of Sibolga City State Vocational Schools. This study uses quantitative methods, the model used is path analysis with analytical and inferential techniques. The population in the study were all teachers of the Sibolga City Vocational School, amounting to 203 teachers. The research sample was determined using proportional random sampling technique so that a sample of 135 teachers was obtained. The research instrument used for data collection was a questionnaire. The results of this study were found: (1) there is a positive direct effect of organizational culture on job satisfaction with a correlation coefficient $\rho = 0.18$ with a contribution of 03%; (2) there is a positive direct effect of the principal's leadership on job satisfaction with the correlation coefficient $\rho = 0.42$ with a direct influence of 18%; (3) there is a positive direct effect of organizational culture on organizational commitment with a correlation coefficient $\rho = 0.23$ with a contribution of 5%; (4) there is a positive direct effect of the principal's leadership on organizational commitment with a correlation $\rho = 0.23$ with a contribution of 5%; and (5) there is a direct effect of positive job satisfaction on organizational commitment with a correlation coefficient $\rho = 0.24$ with a contribution of 6%. So, to increase organizational commitment there needs to be an increase in organizational culture, principals' leadership, and job satisfaction.

Keywords: Organizational culture, principal leadership, job satisfaction, organizational commitment.

1 Introduction

Education is a major factor in supporting the progress of a nation through improving the quality of human resources (HR). A developed nation is a nation that has quality human
resources. Superior human resources (HR) are requirements for the realization of readiness in facing all developments in the era, including the era of globalization.

The quality of education in Indonesia is very low when compared to countries on an international scale. According to [2] Indonesia was ranked third from the bottom in terms of quality education, in 2006 Indonesia ranked 50th out of 57 participating countries. The low quality of Indonesian human resources can also be observed from the low number of the Human Development Index (HDI) which is in the rank of 106 out of 109 countries (Ministry of National Education in Ambarita and Pangaribuan 2013: 86). Furthermore, based on the results of research conducted by Balitbang PDIP in 2008 stated that the percentage of decent teachers in accordance with their profession was as follows: high school teachers 67.1%, junior high school teachers 64.1%, and elementary teachers 50.7%. This marks the average overall teacher, starting from elementary, middle and high school, with an average of 60.3% not yet professional or not worthy of being a teacher. Therefore, teacher organizational commitment needs to be improved so that the teacher is able to carry out his duties as a teacher well so that the goals of national education can be achieved.

According to [1], schools are educational institutions that are held in a very regular time, a program that is very rich and systemic, carried out by educational staff who are professional in their fields and equipped with adequate facilities. The quality of Indonesian education is currently considered low. Efforts made to achieve educational goals have been the subject of studies by education stakeholders in Indonesia.

Schools as an education system have components that are related to each other and contribute to the achievement of goals. These components are students, curriculum, teaching materials, teachers, principals, other education personnel, environment, facilities, learning processes and results or outputs. All the components of the course must synergize, change to a better direction and develop in accordance with the demands of the times or changes that occur around it, of course changes in change and development must include all components of the school.

Vocational High School (SMK) is one form of formal education unit that provides vocational education at the secondary education level as a continuation of SMP / MTs or other forms of equivalent or continued learning outcomes that are recognized as equal / equivalent to SMP / MTs. Vocational High School is one of the levels of secondary education with the specialty of preparing graduates to be ready to work. Vocational education has varied meanings but can be seen as a red thread. With the understanding that each field of study is vocational education as long as the field of study is studied more deeply and the depth is intended as a provision to enter the workforce.

The teacher as a sub-system of the school is the component that most determines how the educational process works and how the educational goals are achieved. Based on the results of studies in developing countries, it has been proven that teachers make the highest contribution in learning achievement (36%), followed by management (23%), study time (22%), and physical facilities (19%), delivered by the Director General Dikdasmen at the Open University Anniversary XVI Anniversary. (http://smkn2sibolga.sch.id/pemberdayaan-guru/13-03-2017).

In working the teacher must have a sense of responsibility and high dedication to the work itself and to the work environment. Teachers will work with full responsibility and dedication if they have organizational commitment. [2] says that commitment is the most basic thing for everyone in their profession. The success of a person in a task given to him is determined by how committed they are to the task and the level of education or knowledge. Without a commitment, the tasks given to him are difficult to carry out properly. A high
commitment to the task becomes a motivation to do with sincerity. Streer in [3] states that organizational commitment is as follows: (1) a strong desire to remain as a particular organization; (2) the desire to strive according to the wishes of the organization; (3) Certain beliefs, and acceptance of organizational values and objectives. In order to realize this many factor, influence it, including organizational culture.

Colquitt, Lepine, and Wetson (2009: 68-69) define that organizational commitment is the desire to remain a member of the organization. So, a teacher who has a high organizational commitment to the school where he works, does not want to leave the school, because he feels that the goal organization in accordance with its objectives, namely the willingness of people to stay with the organization and contribute passionately to achieving goals.

Aron and Greenberg (1990) suggest that the higher the level of responsibility and autonomy given to someone in carrying out work, the more attractive a job is to someone, the higher the commitment. Conversely, the more open opportunities to work in other places, the lower the commitment. The level of satisfaction in the current work has an effect on the level of commitment. Furthermore, the situation of organizational culture is able to raise the level of employee commitment, as well as the attention of the organization to the level of welfare.

Regarding teacher job satisfaction, Davis and Newstrom in Ambarita, Siburian, and Situmorang [5] stated that job satisfaction is defined as someone's feeling of being happy or unfavorable regarding their work. In other words, job satisfaction is a perception of someone or what has been done or done. Job satisfaction will be obtained when there is a match between the expectations of workers with the reality obtained from where they work.

[4] explain that job satisfaction affects performance and organizational commitment. That is, paying attention to job satisfaction is important because it affects a person's performance, where performance determines the achievement of a work goal. In conclusion, teacher job satisfaction can influence the achievement of educational objectives at the school level and ultimately the educational goals nationally. So that the factors or things that affect teacher job satisfaction are very important to note.

Based on the author's observations in the field, through interviews with several teachers from each Sibolga City State Vocational School and several students it was found that there were still teachers who acted only as presenters who had not mastered the material in depth. The process of teaching and learning activities observed by researchers varied, some of which took place effectively and some were lacking, and some were not at all. Things like this appear in different teaching and learning situations, not yet utilizing available teaching time, starting lessons that are not on time, rarely using interactive media, lacking cooperation among fellow teachers, still lacking work motivation. There are also teachers who have been involved in an education and training so that the impact on the teacher feels less satisfied in carrying out their duties and responsibilities. The above situation shows the weak implementation of management, low human resources possessed, organizational culture that has not been oriented to quality, low performance and weak organizational commitment. [4] in his research suggested that the problems experienced by secondary school teachers today are weak organizational commitment.

Marcoulides and Heck in [6] suggest that organizational culture as a concept can be a means to measure the suitability of organizational goals, strategic and organizational tasks, and can be produced. Hofstede in [7] suggests that culture can be defined as various interactions of habitual characteristics that influence groups of people in their environment.

According to [9], another factor considered to be influencing organizational commitment is leadership. Anoraga [8] suggests that there are nine roles of leadership in an organization, namely leaders as planners. Leaders as policymakers, leaders as experts, leaders as executors,
leaders as controllers, leaders as gift givers or punishments, leaders as role models and symbols or symbols, leaders as places to blame, and leaders as substitutes for other members' roles. Therefore, the dreamer's ability from a leader becomes an important condition. If a leader is right, it can be assumed that the level of teacher organization commitment will also increase.

Teacher job satisfaction determines the formation of organizational commitment. Teacher job satisfaction needs to get serious attention, because job satisfaction allows high levels of dedication to the work done. [9] suggests that job satisfaction is an assessment, feeling or attitude of a person or employee towards his work and is related to the work environment, type of work, compensation, relationships between coworkers, social relations in the workplace and so on. If a teacher is satisfied with what he receives, it will produce high quality and productivity. Conversely, if the teacher does not feel satisfaction in carrying out his duties, then this might cause things that would be detrimental to the school, such as low quality schools, such as low quality of work, lack of discipline in carrying out teaching, often late coming to school, less attention to students those who have problems, look for busyness in other places, do not take seriously in carrying out tasks, are apathetic, and lack initiative to hold innovations in the teaching and learning process.

In general, in Indonesia public schools are still the main choice of the community. Besides quality can still outperform private schools, also the costs needed are relatively less. State Vocational Schools in Sibolga City (State Vocational School 1, State Vocational School 2, and State Vocational School 3) are the main choices for the community of Sibolga City, also Central Tapanuli Regency as their place or their children study, while other State Vocational Schools outside Sibolga are only an escape alternative. That means that State Vocational Schools are the foundation of hope for giving birth to intelligent people according to national education goals.

Based on the explanation above, according to the context of the teacher's role, it is assumed that organizational culture, leadership of the principal, and job satisfaction, have an effect on organizational commitment to teachers of Public Vocational Schools in Sibolga City. This study was designed to test it.

2 Methodology

The location of this research is Sibolga City State Vocational School which consists of 3 schools. This research was conducted using quantitative research methods. The model used is the path analysis model. The path model used in this study is a correlation path model, because in this model exogenous correlation is calculated. This study analyzes the influence of one variable on the other variables, namely: (1) organizational culture, (2) principal leadership, (3) job satisfaction, and (4) teacher organizational commitment.

The number of samples was carried out by referring to the Krejcie-Morganyang Table which was chosen proportionally with a confidence level of 95%, for a population of 203, it obtained a sample of 135 people. Sampling is done by proportional random sampling.
3 Result and Discussion

Based on the results of research on organizational commitment, the mean = 107.97; SD = 16.08; Mode = 115.83; and median = 107.5.

Table 1. The results of research on organizational commitment

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Class Edge</th>
<th>Abs. Freq. ( (f_{abs}) )</th>
<th>Rel. Freq. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>72-79</td>
<td>71.5</td>
<td>8</td>
<td>5.93</td>
</tr>
<tr>
<td>2</td>
<td>80-87</td>
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<td>87.5</td>
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<td>4</td>
<td>96-103</td>
<td>95.5</td>
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<td>14.07</td>
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<td>8</td>
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</tr>
<tr>
<td><strong>Sum</strong></td>
<td></td>
<td></td>
<td><strong>135</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The results of organizational culture research, the mean = 123.2; SD = 21.91; Mode = 133.65; and median = 123.19.

Table 2. The results of organizational culture research

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Class Edge</th>
<th>Abs. Freq. ( (f_{abs}) )</th>
<th>Rel. Freq. (%)</th>
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<tbody>
<tr>
<td>1</td>
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<td>5.19</td>
</tr>
<tr>
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<td>7</td>
<td>5.19</td>
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<tr>
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<td>16</td>
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<td>4</td>
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<tr>
<td>5</td>
<td>97-107</td>
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<td>15.56</td>
</tr>
<tr>
<td>6</td>
<td>108-118</td>
<td>107.5</td>
<td>30</td>
<td>22.22</td>
</tr>
<tr>
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<td>119-129</td>
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<td>15.56</td>
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<tr>
<td>8</td>
<td>130-140</td>
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<td>13</td>
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</tr>
<tr>
<td><strong>Sum</strong></td>
<td></td>
<td></td>
<td><strong>135</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The results of principal leadership, so that mean = 110.17; SD = 16.92; Modus = 115.76; and median = 110.74.

Table 3. The results of principal leadership

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Class Edge</th>
<th>Abs. Freq. ( (f_{abs}) )</th>
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<td>91-100</td>
<td>90.5</td>
<td>22</td>
<td>16.30</td>
</tr>
<tr>
<td>5</td>
<td>101-110</td>
<td>100.5</td>
<td>20</td>
<td>14.81</td>
</tr>
<tr>
<td>6</td>
<td>111-120</td>
<td>110.5</td>
<td>40</td>
<td>29.63</td>
</tr>
<tr>
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<td>22</td>
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<tr>
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<td>131-140</td>
<td>130.5</td>
<td>15</td>
<td>11.11</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
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<td></td>
<td><strong>135</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The results of job satisfaction, so that mean = 106.85; SD = 16.87; Modus = 110.56; and median = 109.43.
Table 4. The results of principal leadership

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Class Edge</th>
<th>Abs. Freq. (f_{abs})</th>
<th>Rel. Freq (%)</th>
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<td>80-87</td>
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<td>14</td>
<td>10.37</td>
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<tr>
<td>3</td>
<td>88-95</td>
<td>87.5</td>
<td>5</td>
<td>3.70</td>
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<td>4</td>
<td>96-103</td>
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<td>14</td>
<td>10.37</td>
</tr>
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<td>5</td>
<td>104-111</td>
<td>103.5</td>
<td>29</td>
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<tr>
<td>6</td>
<td>112-119</td>
<td>111.5</td>
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<tr>
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<td></td>
<td></td>
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<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The level of tendency for research into organizational commitment:

Table 5. The level of tendency for research into organizational commitment

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Obs. Freq.</th>
<th>Relative Freq.</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
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<td>81</td>
<td>60.00%</td>
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</tr>
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<td>2</td>
<td>81 – 108</td>
<td>46</td>
<td>34.07%</td>
<td>Enough</td>
</tr>
<tr>
<td>3</td>
<td>54 – 80</td>
<td>8</td>
<td>5.93%</td>
<td>Less</td>
</tr>
<tr>
<td>4</td>
<td>&lt; 54</td>
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<tr>
<td><strong>Sum</strong></td>
<td></td>
<td><strong>135</strong></td>
<td><strong>100%</strong></td>
<td></td>
</tr>
</tbody>
</table>

The level of tendency for research into organizational culture:

Table 6. The level of tendency for research into organizational culture

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Obs. Freq.</th>
<th>Relative Freq.</th>
<th>Category</th>
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<tbody>
<tr>
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<td>54</td>
<td>40.00%</td>
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</tr>
<tr>
<td>2</td>
<td>84 – 113</td>
<td>55</td>
<td>40.74%</td>
<td>Enough</td>
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<td>3</td>
<td>56 – 83</td>
<td>24</td>
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</tr>
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<td>&lt; 56</td>
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<td>Low</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

The level of tendency for research into principal leadership:

Table 7. The level of tendency for research into principal leadership

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Obs. Freq.</th>
<th>Relative Freq.</th>
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</thead>
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<tr>
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<td>2</td>
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<td>55</td>
<td>40.74%</td>
<td>Enough</td>
</tr>
<tr>
<td>3</td>
<td>56 – 83</td>
<td>11</td>
<td>8.15%</td>
<td>Less</td>
</tr>
<tr>
<td>4</td>
<td>&lt; 56</td>
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<td>0%</td>
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</tr>
<tr>
<td><strong>Sum</strong></td>
<td></td>
<td><strong>135</strong></td>
<td><strong>100%</strong></td>
<td></td>
</tr>
</tbody>
</table>

The level of tendency for research into job satisfaction:

Table 8. The level of tendency for research into job satisfaction

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Obs. Freq.</th>
<th>Relative Freq.</th>
<th>Category</th>
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<tr>
<td>1</td>
<td>&gt;108</td>
<td>68</td>
<td>50.37%</td>
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</tr>
<tr>
<td>2</td>
<td>81 – 108</td>
<td>54</td>
<td>40.00%</td>
<td>Enough</td>
</tr>
<tr>
<td>3</td>
<td>54 – 80</td>
<td>13</td>
<td>9.63%</td>
<td>Less</td>
</tr>
<tr>
<td>4</td>
<td>&lt;54</td>
<td>0</td>
<td>0%</td>
<td>Low</td>
</tr>
</tbody>
</table>
3.1 Research Hypothesis

3.1.1 First Hypothesis
Test calculation criteria obtained by the results of the magnitude of the path coefficient \( \rho_{31} = 0.18 \), then t test. Ha accepted if \( \text{thitung} > \text{ttabel} \), the opposite if \( \text{thitung} < \text{ttabel} \) so that Ho accepted. From the calculations that have been made, the values obtained \( \text{thitung} = 2.30 \), while \( \text{ttabel} = 1.656 \) and \( \alpha = 0.05 \) as big as 1.656. Therefore \( \text{thitung} > \text{ttabel} \), so that Ho refused and Ha accepted, which means the path coefficient is significant and proven. So, organizational culture has a positive direct effect on job satisfaction in Sibolga City Public Vocational School.

3.1.2 Second Hypothesis
Test calculation criteria obtained by the results of the magnitude of the path coefficient \( \rho_{32} = 0.42 \), then t test. Ha accepted if \( \text{thitung} > \text{ttabel} \), and opposite if \( \text{thitung} < \text{ttabel} \) so Ho accepted. From the calculations that have been made, the values obtained \( \text{thitung} = 6.36 \), while \( \text{ttabel} = 1.656 \) and \( \alpha = 0.05 \) as big as 1.656. Therefore \( \text{thitung} > \text{ttabel} \), so that Ho refused and Ha accepted, which means the path coefficient is significant and proven. So, principals' leadership has a direct positive effect on job satisfaction in Sibolga City Public Vocational School.

3.1.3 Third Hypothesis
Test calculation criteria obtained by the results of the magnitude of the path coefficient \( \rho_{41} = 0.23 \), then t test. Ha accepted if \( \text{thitung} > \text{ttabel} \) and opposite if \( \text{thitung} < \text{ttabel} \) so Ho accepted. From the calculations that have been made, the values obtained \( \text{thitung} = 3.22 \), while \( \text{ttabel} = 1.656 \) and \( \alpha = 0.05 \) as big as 1.656. Therefore \( \text{thitung} > \text{ttabel} \), so Ho refused and Ha accepted which means the path coefficient is significant and proven. So, organizational culture has a positive direct effect on organizational commitment in Sibolga City Public Vocational School.

3.1.4 Fourth Hypothesis
Test calculation criteria obtained by the results of the magnitude of the path coefficient \( \rho_{42} = 0.23 \), then t test. Ha accepted if \( \text{thitung} > \text{ttabel} \) and opposite if \( \text{thitung} < \text{ttabel} \) so Ho accepted. From the calculations that have been made, the values obtained \( \text{thitung} = 3.02 \), while \( \text{ttabel} = 1.656 \) and \( \alpha = 0.05 \) as big as 1.656. Therefore \( \text{thitung} > \text{ttabel} \), so Ha accepted which means path coefficients are significant and proven. So, principals' leadership has a direct positive effect on organizational commitment in Sibolga City Public Vocational School.

3.1.5 Fifth Hypothesis
Test calculation criteria obtained by the results of the magnitude of the path coefficient \( \rho_{43} = 0.24 \), then t test. Ha accepted if \( \text{thitung} > \text{ttabel} \) and opposite if \( \text{thitung} < \text{ttabel} \) so Ho accepted. From the calculations that have been made, the values obtained \( \text{thitung} = 3.12 \), while \( \text{ttabel} = 1.656 \) and \( \alpha = 0.05 \) as big as 1.656. Therefore \( \text{thitung} > \text{ttabel} \), so Ho Ho refused and Ha accepted which means path coefficients are significant and proven. So, job satisfaction in Sibolga City Public Vocational School.

<table>
<thead>
<tr>
<th>Class Interval</th>
<th>Obs. Freq.</th>
<th>Relative Freq.</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>135</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>
satisfaction has a positive effect on organizational commitment in Sibolga City Public Vocational School.

3.2 Discussion of Research Results

There are 5 hypotheses tested with Path Analysis. The five hypotheses have proven true.

3.2.1 Organizational Culture (X1) Direct Effect on Job Satisfaction (X3)

Based on the results of research that has been carried out there is the influence of organizational culture with job satisfaction where the magnitude of the effect is large (path coefficient between X1 with X3 (ρ32) = 0.18 with a large of 3%).

3.2.2 Principal Leadership (X2) Direct Effect on Job Satisfaction (X3)

Based on the results of the research that has been carried out there is the influence of the principal's leadership with job satisfaction where the amount of influence is large (the path coefficient between X2 and X3 (ρ32) = 0.42 with a large 18%).

3.2.3 Organizational Culture (X1) Affects Directly on Organizational Commitment (X4)

Based on the results of the research that has been done there is an influence of organizational culture with organizational commitment where the influence is large (path coefficients between X1 and X4 (ρ41) = 0.23 or 5%).

3.2.4 Principal Leadership (X2) Influences Directly on Organizational Commitment (X4)

Based on the results of the research that has been done there is the effect of job satisfaction with organizational commitment where the magnitude of the effect is equal (path coefficient between X2 and X4 (ρ42) = 0.23 or 5%).

3.2.5 Job Satisfaction (X3) Influences Directly on Organizational Commitment (X4)

Based on the results of the research that has been carried out there is an influence of job satisfaction and organizational commitment where the amount of influence is large (the path coefficient between X3 and X4 (ρ43) = 0.24 or 6%.

3.3 Research Limitations

This study only explains the influence of organizational culture, principals' leadership, and job satisfaction on teacher organizational commitment to the State Vocational Schools in Sibolga City, so research needs to be conducted with a wider sample size, to be generalized in general.

In making a scientific work, many stages and processes must be carried out. As a scientific work, this research is carried out as well as possible in accordance with the procedures of scientific work. However, it is realized that the results obtained are still lacking as a result of existing limitations, resulting in results that are not fully in line with expectations.

In this study the data obtained was only through filling out questionnaires and observations given to respondents who were selected for the four variables. The research instruments distributed to respondents were only conducted one trial, based on valid and reliable statistical calculations, therefore the weakness of the instruments used still remained. In addition, respondents may not really fill in or complete the research questionnaire provided so that the answers given do not reflect the actual results. Limitations in this study will provide
opportunities for advanced researchers who will continue and test other factors related to organizational commitment

4 Conclusion

Some conclusions can be taken as follows:

a. There is a positive direct effect between organizational culture (X1) on job satisfaction (X3).

b. There is a positive direct influence between principals' leadership (X2) on job satisfaction (X3).

c. There is a positive direct influence between organizational culture (X1) on organizational commitment (X4).

d. There is a positive direct influence between principals' leadership (X2) on organizational commitment (X4).

e. There is a positive direct effect between job satisfaction (X3) on organizational commitment (X4).

Implications

Based on the conclusions described above, the implications will be as follows:

1. Efforts to increase organizational commitment through organizational culture.
2. Efforts to increase organizational commitment through the leadership of the principal.
3. Efforts to increase organizational commitment through teacher job satisfaction.
4. Efforts to increase organizational commitment through organizational culture, principals' leadership and job satisfaction.

Suggestions

Based on the research findings, the following suggestions are proposed to increase teacher organizational commitment, namely:

1. The principal should:
   a. Maintain a good and conducive school atmosphere by creating conditions of mutual respect, respect, between the teacher and the principal, between the teacher and the school community and being able to create a sense of belonging to the school, and by providing clear and fair tasks, reward and legal relationships surely, participation in decision making, pressure on achievement, pressure on training and development, security in carrying out tasks, openness of recognition and feedback, teacher enthusiasm in teaching.
   b. Involving teachers in finding solutions to problems that are being faced by schools and providing equal opportunities for teachers to develop themselves.
(2) Teachers should:
(a) Build cooperation, open communication, and harmonious relationships for fellow teachers, so that if one teacher faces difficulties can be discussed and resolved together and always think positively about the criticisms and suggestions given by the principal and fellow teachers.
(b) Teachers must increase their knowledge and understanding of work motivation, job satisfaction which in essence is the internal condition of a teacher who encourages him to achieve an achievement or success by always actively developing himself, adding insight and knowledge to support his work in learning, sharing new experiences and information on matters that support PBM activities and build empathy and solidarity with others.

(3) Government (The education office) should:
(a) Support and provide equal opportunities for teachers to develop themselves such as providing opportunities for teachers to continue their education to a higher level.
(b) Routine conduct activities that aim to improve teacher abilities
(c) Give rewards to teachers who excel, as motivation for the teacher concerned and for other teachers.

(4) For other researchers, further research is needed on this research with different variables that influence the organizational commitment of the teacher, given the limitations in conducting research and the results obtained are not maximal.

References
Efforts to Increase Activities and Student Learning Results Using Inquiry Method in Class IV Primary School 060843 Medan

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{* husnatambunan@gmail.com }

Faculty of Education, Universitas Negeri Medan, Medan, Indonesia

Abstract. Classroom action research aims to improve the activity and student learning outcomes with the application of inquiry learning methods. The study consisted of 2 cycles of the number of students 25. Collecting data using achievement test, student questionnaire responses, and observations of students in learning activities with the method of inquiry. Data analysis using quantitative techniques and qualitative techniques by linking existing data. The analysis showed: (1) an increase in the activity of the students are in the first cycle of acquisition activity by 61.25% students and 75.63% with enough categories. In the second cycle increased to 92.50% with very good category. (2) an increase in student learning outcomes in the first cycle is the average value of student learning outcomes for cognitive assessment was increased to 82 disiklus 60 to II with the percentage of students who obtained excellent learning predicate 96%. For the assessment of students psychomotor also increased in the first cycle is the highest score obtained by the students increased 3.30 to 3.40 in the second cycle with the percentage of students who received either 72% predicate learning. For the assessment of affective (honest, discipline and cooperation) also increased in the first cycle is 12% to 48%. Based on the above results it can be concluded that the application of the inquiry method can improve the activity and learning outcomes of students in the fourth grade SDN.060843 Medan.

Keywords: Inquiry method, students’ activity, students’ learning result

1 Introduction

Education is a form of dynamic human culture and developmental conditions. Therefore, changes or developments in education are things that should actually happen in line with changes in the culture of life. Changes in the sense of improving future interests. Education that supports development in the future is education that is able to develop the potential of students, so that those concerned are able to face and solve the problems of life they face. Education must touch the potential of conscience or the competency potential of students. The concept of education feels increasingly important when one must enter the life of society and the world of work, because the person concerned must be able to apply what is learned in school to deal with the problems faced in daily life today and in the future. This thinking has the consequence that the improvement or improvement of formal education (school/madrasah) to anticipate future needs and challenges needs to be continuously carried out,
aligned with the development of the needs of the business world / industry, the development of the world of work, as well as the development of science, technology and art.

Improving the quality of education is a process that is integrated with the process of improving the quality of human resources themselves. Recognizing the importance of the process of improving the quality of human resources, the government has and is trying to make it happen through various efforts to develop higher quality education. These efforts include through the development and improvement of the curriculum.

The 2013 curriculum is a curriculum that emphasizes competency with thinking based on attitudes, skills, and knowledge. The most fundamental feature of the 2013 curriculum is to demand the ability of teachers to be knowledgeable and to find out as much knowledge as possible because today's students have easily sought information freely through technological and information developments. Whereas for students more encouraged to have responsibility for the environment, interpersonal, interpersonal skills, and have critical thinking skills. The goal is to form productive, creative, innovative and affective generations.

In the characteristics of the 2013 curriculum, integrated learning curriculum is applied. Integrated curriculum as an integrated thematic role model is one of the learning approaches where the competencies (knowledge, skills, and attitudes) of various subjects are combined into one to form a deeper and fundamental understanding of what students must master. Students are required to be able to construct their knowledge through interaction with objects, phenomena, experiences and their environment, through a scientific approach (scientific approach).

Learning with a scientific approach (scientific approach) is a learning process designed in such a way that students actively construct concepts, laws or principles through observing stages (to identify or find problems), formulate problems, propose or formulate hypotheses, collect data with various techniques, analyzing data, drawing conclusions and communicating concepts, laws or principles that are "discovered". Therefore, learning conditions that are expected to encourage students to find out from various sources through observation, and not just be told.

Thus, the criteria for learning by using the application of a scientific approach are essentially aimed at encouraging and inspiring students to think critically, analytically, and precisely in identifying, understanding, solving problems, and applying learning material, so that the end result is improvement and balance between the ability to be a good human being (soft skills) and human beings who have the skills and knowledge to live properly (hard skills) of students which includes aspects of competency in attitudes, knowledge, and skills.

[1] states, that learning will be more meaningful (Meaningful), if students not only learn to overcome something (Learning to know), but students also learn to do (Learning to do), learn to be animated (Learning to be), and learning to socialize with friends (Learning to live together). In other words, students are given the opportunity to try their own to find answers to a problem, work with classmates, or make things far more challenging and directing students' attention than if students only have to digest the information given in the same direction. For this reason, it is necessary to create a learning environment system that allows the learning process to occur. To achieve these indicators the teacher must be able to choose learning methods that are appropriate to the subject matter and are able to present interesting learning methods.

Many factors that cause low student learning outcomes can come from within the students themselves which are often called internal factors and some are from outside students, namely external factors. Factors that come from within students are abilities, intelligence, attitudes and interests. Factors that come from outside the student are family environment, community
school and one of them comes from the teacher. The role of the teacher in the learning process is very influential. Because the teacher is a student motivator in the lesson. To achieve maximum results, the teacher must be able to choose and adjust the right method with the material presented, so that with such learning will create an active classroom atmosphere, namely the existence of a positive interaction between students and teachers, the state of the active class can produce results satisfying learning obtained by students after learning.

Therefore, it is necessary to have a variety of learning methods so that the learning process is not boring, so that it can attract students' attention to learning and ultimately the quality of learning increases. The use of various methods will not benefit teaching and learning activities if their use is inappropriate and not in accordance with the situation that supports and with the psychological condition of students. The teacher plays an important role in creating conditions that allow students to develop themselves as active students. The ability of teachers to use various methods and learning media is very necessary.

The observations made by researchers at SDN 060843 Medan, showed that there were several problems found during the learning process, such as: 1) the learning methods applied by the teacher were still conventional learning methods such as lecture methods, question and answer and assignments, 2) students do irrelevant learning activities such as drowsiness, playing games, even noisy when learning is taking place, 3) teachers have not yet empowered all of their potential in teaching, so student activities in learning are still very low.

To increase the activity and student learning outcomes in my dream theme in grade IV-3 SDN 060843 Medan required a method that is able to bring change to a better direction, namely the teaching and learning process which includes a process of interaction or reciprocity between the teacher and students in teaching and learning activities. The inquiry method is a form of student-oriented learning method that has differences with conventional methods. The Inquiry Method emphasizes the critical and analytical thinking process to find and find answers to a question in question.

Inquiry method is a learning method that seeks to instill the basics of scientific thinking in students, so that in this learning process students learn more themselves, develop creativity in solving problems. Students are truly placed as learning subjects. The role of the teacher in learning with the inquiry method is as a mentor and facilitator. The teacher's job is to choose the problems that need to be conveyed to the class to solve. But it is also possible that the problem to be solved is chosen by students. The next task of the teacher is to provide learning resources for students in order to solve problems. Teacher guidance and supervision is still needed, but intervention in student activities in problem solving must be reduced [2].

Inquiry method is one of the effective learning methods applied to the scientific approach, because in the learning steps in this study include observing, questioning, collecting data, processing data, and communicating. By using this learning method in the classroom, students can form a mindset, reasoning, present students' conceptual and procedural knowledge, and form interactions between teachers and students, students with students. Thus, if the theme of my dreams is learned by the method of inquiry, it is hoped that it can increase student activities and learning outcomes. The need for the use of varied learning methods and various learning media is expected to improve the quality of learning.

Thus, based on the background of the problem above, the formulation of the problem in this study are: 1) Does the application of the inquiry method improve student learning activities on the theme of the beauty of my country in grade IV primary school 060843 Medan?

2) Does the application of the inquiry method improve student learning outcomes on the theme of the beauty of my country in grade IV primary school 060843 Medan?
The purpose of this study is: 1) Improving the learning activities of the fourth-grade students of primary school 060843 Medan on the theme of the beauty of my country through inquiry method. 2) Improving the learning outcomes of grade IV students of primary school 060843 Medan on the theme of the beauty of my country through the inquiry method.

1.1 Review Of Literature

1.1.1 Learning Results

According to Bloom in Max [5], there are 3 abilities expected by students as learning outcomes, namely:

1) Cognitive Domains are behaviors related to knowledge, memory, understanding, explaining, describing, planning, assessing, and applying.

2) Affective Domain is a behavior related to the attitude of receiving, responding, assessing, organization, and characteristics.

3) Psychomotor Domain is a behavior that is related to skills or skills related to physical.

The learning process is the stages that are passed in developing one's cognitive, affective and psychomotor abilities, in this case the ability that must be possessed by students or students. Learning outcomes are a series of abilities that students want to achieve that include aspects such as the following: (1) memorization (C1) namely the ability to retract information stored in long-term memory. This category includes 2 types of cognitive processes namely recognizing and recalling; (2) understanding (C2) is the ability to construct meaning and understanding based on the initial knowledge possessed or to integrate new knowledge into the schemes that are already in students' thinking. Understanding categories include 7 cognitive processes which are interpreting, exemplifying, classifying, summarizing, drawing inferior, comparing, and explaining; (3) applying (C3) that is the ability to use a procedure to solve a problem or do a task. This category includes 2 cognitive processes namely running (executing) and implementing (implementing); (4) analyzing (C4) namely the ability to describe a problem or object to its elements and determine how the interrelationships between these elements. There are 3 types of cognitive processes that are included in the analysis, namely decipher (differentiating), organizing (organizing) and finding the implicit message (attributing); (5) evaluate (C5) that is the ability to make a consideration based on existing criteria and standards. There are 2 kinds of cognitive processes that are included in evaluating namely checking and critiquing; (6) make (C6) the ability to combine several elements into a form of unity. There are 3 types of cognitive processes that are included in this category, namely generating, planning, producing.

1.1.2 Learning Activity

Activities are all types of activities carried out by students in learning with the purpose of behavioral change, both regarding knowledge, skills and attitudes, both covering all aspects of organism or personal. So, in principle learning is doing to change behavior. There is no learning if there is no activity. That is why activity is a very important principle or principle in teaching-learning interaction.

Student activity is the involvement of students in the form of attitudes, thoughts, attention, and activities in learning activities to support the success of the teaching and learning process and benefit from the activities. Increased student activity is the increasing number of students asking and answering, the increasing number of students interacting with each other discussing learning material. Learning strategies must be able to encourage student activity.
The activity is not intended to be limited to physical activity, but also includes psychic activities such as mental activity [3].

The activeness of students in the learning process will lead to high interaction between the teacher and students or with the students themselves. This will result in a fresh and conducive classroom atmosphere, where each student can engage as much as possible. Activities that arise from students will also result in the formation of knowledge and skills that will lead to increased achievement. Dierich in [4] classifies activities as follows:

1. Visual activities such as reading, watching pictures, and demonstrations.
2. Oral Activities such as stating, formulating, asking questions, giving suggestions, issuing opinions, conducting interviews, and discussing.
3. Listening Activities such as listening to descriptions, conversations, discussions, music, speeches.
4. Writing Activities such as writing stories, essays, reports, questionnaires, copying.
5. Drawing activities such as drawing, making graphics, maps, diagrams.
6. Motor activities such as conducting experiments, making construction, repairing, playing, gardening, raising models.
7. Mental activities such as responding, remembering, solving problems, analyzing, seeing relationships, making decisions.
8. Emotional activities such as interest, feeling bored, happy, excited, brave, calm, and nervous.

1.2 Inquiry Method

Inquiry learning methods basically include the desire that learning should be based on student questions. Learning wants students to work together to solve problems rather than receive instruction directly from the teacher. The teacher is seen as a facilitator in learning rather than a vessel in knowledge. The teacher's work in the environment of inquiry learning is not to offer knowledge but to help students during the process of seeking their own knowledge.

The use of inquiry learning methods in learning is based on constructivist views. According to constructivist views, learning is a process of knowledge formation. This formation must be done by the learner (student). Students must be active in carrying out activities, actively thinking, drafting concepts and giving meaning about the things being learned.

<table>
<thead>
<tr>
<th>Step</th>
<th>Activities</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>The teacher gives explanations,</td>
<td>Students listen carefully to the teacher's</td>
</tr>
<tr>
<td></td>
<td>instructions or questions about</td>
<td>explanation</td>
</tr>
<tr>
<td></td>
<td>the material to be taught.</td>
<td></td>
</tr>
<tr>
<td>Formulate the problem</td>
<td>The teacher brings students to a problem or problem that contains a puzzle. The problem presented is a problem that challenges students to solve</td>
<td>Students try to solve the problems or problems that the</td>
</tr>
</tbody>
</table>

Table 1. Steps of the Inquiry Method
think about solving the puzzle, students are encouraged to find the right answers.

submit a hypothesis

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher gives a temporary answer to a problem that is being studied.</td>
<td>Students record important things given by the teacher in order to solve the problem</td>
</tr>
</tbody>
</table>

Collecting data

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher asks questions that can encourage students to think about finding the information needed.</td>
<td>Students answer the questions given by the teacher and start looking for more clear and correct information to solve the problem given by the teacher.</td>
</tr>
</tbody>
</table>

Test the hypothesis

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher determines the answers that are considered acceptable according to the data and information that students have obtained based on data collection.</td>
<td>Students listen to the teacher's explanation of the data they have obtained.</td>
</tr>
</tbody>
</table>

Formulate conclusions

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher invites students to summarize in the form of formulations as conclusions that can be accounted.</td>
<td>Students record the results of the conclusions given by the teacher.</td>
</tr>
</tbody>
</table>

2 Methodology

This type of research is Classroom Action Research (classroom action research) which is a form of research conducted by the teacher to improve the learning process which consists of planning (plan), action (action), observation (observation), and reflection (reflection). Subjects in this study were students in grade IV-4 of SD Negeri 060843 Medan, amounting to 25 people, consisting of 15 women and 10 men. Data collection techniques used are by using learning outcomes tests (THB), and observation of student activities.

3 Result and Discussion

The general purpose of this study is to obtain information about student learning activities and student learning outcomes using inquiry methods. Specifically, the objectives to be achieved in this study are (1) knowing how to increase student learning activities and student learning outcomes by using the inquiry method. The theme presented in this study was “The
beauty of my country" with the sub-theme "The beauty of historical heritage" in class IV SDN 060843 Medan.

The results of the study presented in this chapter include the results obtained by students from the assessment aspects of cognitive (knowledge), affective (attitude) and psychomotor (skills) of cycle I and cycle II. The results of the assessment are in the form of students' ability in completing practice questions about the theme being taught (cognitive), students' behavior during the learning process (affective), and students' skills in making assignments given by the teacher (psychomotor) using the inquiry method.

The description and interpretation of data from the results of the first cycle and second cycle research are described in the table below:

Table 1. Obtaining Average Class Values for Cognitive, Affective and Psychomotor Students

<table>
<thead>
<tr>
<th>No</th>
<th>Cognitive I Average value of Cycle I</th>
<th>Affective I Average value of Cycle I</th>
<th>Psychomotor I Average value of Cycle I</th>
<th>Cognitive II Average value of Cycle II</th>
<th>Affective II Average value of Cycle II</th>
<th>Psychomotor II Average value of Cycle II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.48</td>
<td>2.58</td>
<td>2.34</td>
<td>3.17</td>
<td>3.33</td>
<td>3.24</td>
</tr>
</tbody>
</table>

Based on the table above, it can be seen that the test results of students' abilities for cognitive, affective, and psychomotor domains, in the first cycle have not reached the maximum set value of 2.66. In the second cycle there was an increase with the class average reaching 3.00. The percentage of completeness achieved by students from cycle I to cycle II is 0.75%. Thus it can be concluded that, student learning outcomes through inquiry methods have increased. For assessment of student activities can be seen in the table below:

Table 2. Results of Student Activity Assessment

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Cycle I</th>
<th>Cycle II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of average score</td>
<td>Meeting 1</td>
<td>Meeting 2</td>
</tr>
<tr>
<td>Less</td>
<td>61,25</td>
<td>75,63</td>
</tr>
<tr>
<td>Enough</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the table above, it can be seen that there is an increase in student activity from cycle I to cycle II. In cycle I meeting 1 assessment criteria was still lacking with a score of 61.25 and at meeting 2 the assessment criteria became sufficient with a score of 75.63. In the second cycle the assessment criteria became very good with a score of 92.50. Thus it can be concluded that the overall student activity shows an increase in better activity and in general students reach all indicators with good assessment.

4 Conclusion

Based on the results of the research and discussion described above, some conclusions can be obtained as follows:

a. The learning process carried out by the teacher on the theme of "the beauty of my country" sub-theme "the beauty of historical relics" in grade IV-4 SDN 060843 Medan by using the inkuri learning method can be seen from the teacher's activities in learning the theme increased. This can be seen in the first cycle of meetings 1 and
2 at 71.43% and 77.76% with enough categories. In the second cycle of meeting 1, it increased to 92.38% with a very good category.

b. Student activity in learning with the theme of the beauty of my country the sub-theme of the beautiful heritage in class IV-4 SDN 060843 Medan by using the inkuri learning method has increased. this can be seen in the first cycle of meeting 1 at 61.25% with less categories and at meeting 2 at 75.63% with enough categories in cycle II of meeting 1 at 92.50% with very good categories.

c. Student learning outcomes in learning the theme of the beauty of my country the sub-theme of the beautiful heritage in class IV-4 SDN 060843 Medan by using the inkuri learning method also increased. This is seen from the percentage increase in the number of students who have increased in obtaining the final predicate. The percentage of students in cycle I who received a very good predicate (SB) was 12% while in cycle II it increased to 48%. In the predicate of good (B) is 20% and in the second cycle increased to 36%. For the predicate enough (C) was 52% and in the second cycle decreased to 12% and for the predicate less (D) was 16% and decreased to 4%.

References


Needs Analysis of Vocational High School Supervisors in Batubara District

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Abstract. This study aims to determine the analysis of the needs of Vocational High School supervisors in Batubara District. Needs analysis was done by knowing the data on the number of active Vocational High School supervisors, determining the ideal number of vocational supervisors based on the number of schools, the number of teachers in the subject group, and competencies and the comparison of the number of ideal needs with the actual number of Vocational High School supervisors. The type of research was needs analysis with a qualitative approach. Analysis of supervisory needs was based on the ratio of the needs of Vocational High School supervisors in the Regulation of the Minister of Administrative Reform Bureaucratic Number 21 of 2010 concerning the Functional Position of School Supervisors and Credit Figures. This research was conducted at the Education Office of North Sumatra Province and Batubara District from June to August 2018. Data collection techniques used interview methods, documentation studies, observations, validations carried out by triangulation. The data analysis technique used qualitative analysis which refers to the theories of Miles and Huberman. The results of the study showed that the ideal number of school supervisors needed based on the ratio of the supervisor of the education unit at the vocational level in Batubara District requires supervisor; the ideal number of school supervisors needed based on the ratio of subject teachers at the vocational level in Batubara District, requires 6 supervisors; the ideal number of school supervisors is needed based on the ratio of subject teachers at the level of vocational school in Batubara District 13 supervisors.

Keywords: Needs analysis, school supervisors, vocational school

1 Introduction

The school supervisor profession occupies a strategic position in the chain of education. School supervisors are referred to as education quality assurance personnel in education units. A school supervisors has a set of roles and tasks that not only aims to supervise the organization of education in the schools are good and directional, but the supervisors is required to master all things related with basic tasks and functions of teacher learning, as well as having the ability of the management to the construction of the principal. [7] stated that the planning process is a series of activities to prepare decisions on what is expected to happen and what it will do. While Kaswan [1] explained that human resource planning is a process used by the organization to ensure that the organization has the right amount of workforce, the right type of workforce, carrying out the job properly and carried out at the right time.
In fact, in the Batubara District 9 supervisors of Vocational Schools with a total of 22 Vocational Schools, as well as 511 Vocational Teachers, consisted of 4 Normative supervisors, 3 Adaptive supervisors and 2 Productive supervisors. Thus the number of Vocational Schools owned by the Batubara District is 22 schools. The Vocational School should have the number of school supervisors that must be owned by the Batubara District at least consists of 5 school supervisor teams and 2 supervisors for Vocational subjects.

Based on the above background, the focus of this research is how to plan the needs of Vocational High School supervisors in the Batubara District. The problem of this research are as follows: (1) What is the total ideal of school supervisors needed based on the ratio of the education unit supervisor at the vocational level in the Batubara District? (2) What is the total ideal of school supervisors needed based on clumps of subjects at the vocational level in the Batubara District? (3) What is the total ideal of comparison needs with the actual amount of vocational supervisors in the Batubara District? Based on the research problems above, the purposes in this research are: (1) To find out the total ideal of school supervisors needed based on the ratio of supervisors with education units at the vocational level in the Batubara District. (2) To find out the total ideal of school supervisors needed based on the total of subject matter teachers at the vocational level in the Batubara District. (3) To find out the comparison of the total ideal of needs with the actual total of vocational supervisors in Batubara District. The results of this research are expected to be material for the implementation, strengthening, planning needs of vocational supervisors. In addition, it contributes to the application of theories of planning and managing human resources. The benefits of this research are useful especially: (1) For the head of the Batubara District Education Office in formulating related policies of the planning needs of the vocational supervisor. (2) For the Head of Planning in the District Education Office of Batubara in Identifying prospective school supervisors to meet the needs at the time of recruitment in accordance with the amount planned and for the process of mapping, coaching, promotion and career development for school supervisors and prospective school supervisors; (3) For the supervisor of the research school supervisor, it is useful to empower school supervisors in carrying out their duties in accordance with their assigned duties and functions. (4) For other researchers as information material regarding the planning requirements of vocational school supervisors.

1.1 Human Resource Planning

Planning is the process of determining a plan or program activities. Planning is always related to the objective. Planning helps organizations or companies know what to do. Planning can not be made in haste, but requires sufficient time. According to Maulana [2] planning is a process that systematically and continuously in analyzing the needs of the organization's human resources will be in conditions that are always changing and developing an appropriate personnel policy with a long term plan of the organization. Planning is basically always related to the management concept that is by occupying the main and first positions among other management functions. Samsudin [3] concluded a number of literature and gets the essence of planning, namely, “Planning is intelligent attempts to shape the future better than the past. “Planning is trying to understand the present situation, to analyze it in formal way. “Planning is looking a head. “Planning is bring about better future, current problems are to be overcome, to see what happen in the future. “Based on this essence, it can be stated that planning is related to the future, making the future better than the past, planning trying to understand the present situation by analyzing, and planning to see events that will occur in the future.
A planning must be adapted to the existing conditions and using assumptions for the future so that the targets or goals to be achieved really can be realized. Samsudin [3] said that human resources planning must pay attention to the following matters. (1) collect information on a regular basis and constantly. (2) analyze the supply and demand of human resources in the present and foreseeable future. (3) Collect the results of the analysis as a basis for drafting the policies, programs, projects, and activities in the field of employment and job opportunities. (4) Harness human resources according to the position and quality. (5) Implement monitoring continuously against policy to make changes or adjustments. (6) Integrating human resource planning in a human resource management plan. Based on the above opinion, then human resource planning or planning of the workforce can be defined as a process of determining the needs of the workforce based on existing conditions and using assumptions to collect information regularly and continuously.

1.2 Job and Workload Analysis

The process of analyzing job can be done in certain steps. Hasibuan presents the following steps: (1) Determine the use of the results of job analysis information. (2) collect information about the background. (3) investigate the people who will be given a specific term. (4) collecting job analysis information. (5) reviewing information with interested parties. (6) compile job descriptions and job specifications. (7) predict/take into account organizational development [4].

Since the enactment of Law No. 23 of 2014 concerning Regional Government, the need for Senior High School and Vocational High School supervisors is the responsibility of the provincial government. According to [5] the initial steps that can be taken by the provincial government in an effort to meet the needs of supervisors of education units should be carried out through the analysis of supervisory needs, both based on the number of existing schools and based on subjects, levels of office and rank of school supervisors [5].

The purpose of Vocational High School supervisory needs analysis according to Sudjana is as follows: The purpose of Vocational High School supervisory needs analysis according to[5] is as follows: (1) Meet the needs according to the planned amount. (2) meet the criteria or qualifications that have been established. (3) Facilitating the required school supervisor competence. (4) Placing Vocational High School supervisors according to available formations. (5) Empowering school supervisors according to their basic duties and functions[5].

2 Methodology

This Research Study of Vocational Supervisory Needs Planning Analysis in Batubara Regency was a type of qualitative research with a descriptive analysis approach. Qualitative research subjects are informants or people who provide information needed in research data collection. The research subjects in this research were the actors both directly and indirectly involved in the needs analysis of Vocational High School supervisors in the Batubara District. These people are assumed to be sources of data or sources of information in this research. To specify the subject of the research, used nonprobability sampling technique. According to Sugiyono states that nonprobability sampling is a technique for determining research subjects that do not provide equal opportunities / opportunities for each element to be chosen as the subject of research[6]. In this case the Head of General Affairs of North Sumatra Provincial
Education Office, head of vocational training, Korwas Vocational High School of North Sumatra Province and MKPS chairman of the Batubara District Vocational High School or other authorities assigned to manage Vocational High Schools in the Batubara District. In addition to the above subject, data on the total Vocational High Schools supervisory ratios in Batubara District are currently also used as material for this needs analysis.

This research was carried out at the Batubara District Education Office because even though the management of Vocational High Schools had been in the hands of the provincial government as of January 1, 2017 based on Law No. 23 of 2014, but of course before January 1, 2017, the North Sumatra Provincial Education Office had never make plans for the recruitment of school supervisors for Batubara District.

The techniques used for data collection in this research by observation, interview and documentation study. The techniques of collecting data are carried out in natural settings, primary data sources, and more techniques collection data on observation involving participant observation, in depth interviews and documentation.

The technique analysis data used in this research is qualitative analysis. That is, after the data have been collected further classified and processed. Data processing more use phrases of a sentence as the interpretation of the data processed. According to Miles and Huberman in Sugiyono: "activity in the analysis of qualitative data is done interactively and lasted continuously until it has been completed, so that data saturation" [5]

The data obtained were then analyzed through qualitative data analysis techniques from Miles and Hubermant consisting of: (1) data reduction, (2) the presentation of the data, and (3) the withdrawal of the conclusion.

3 Result and Discussion

The results of this research are described based on the formulation of a problem in Chapter 1, namely: (1) The total ideal of school supervisors needed based on the ratio of education unit supervisors at the Vocational High School level in Batubara District, (2) the total ideal of school supervisors required based on teacher clusters of subjects at the Vocational High School level in Batubara District, (3) Comparison of the total ideal of needs with the actual total of Vocational High School supervisors in the Batubara District.

The total of supervisors in Batubara District Vocational High School is 9 people. Whether this total has been ideal or not, it is necessary to analyze the total ideal. Analysis of the total ideal of supervisors is based on the total of schools and the total of subject matter teachers. KPS in an interview on July 20, 2018 stated that the number of secondary education supervisors in North Sumatra Province, especially in Batubara Districts, was sufficient, even exceeding the needs (appendix 6). In line with AMP, JDL, stated that this matter had been discussed in a meeting with supervision, in the report it meant I thought it was enough. (appendix 5). The second statement the speaker needs to be compared with the prevailing regulation. This comparison to get a proportion of the total of ideal supervisors based on the total of schools. In accordance with article 6 paragraph 2 of the Regulation of the Minister for Doubting State Apparatur and Bureaucratic Reform (Permen PAN / RB) Number 21 of 2010 concerning the target of supervision or the ratio of Vocational High School supervisors, a supervisor is at least for seven education units. The ratio between supervisors and target schools is 1:7.
The results of interviews with AMP obtained information that the total of Vocational High School in the Batubara District was 22 (appendix 6). KPS confirms the total in (appendix 5). The statements of the two informants are in accordance with the release of data from the Education Quality Assurance Institute (LPMP) of North Sumatra Province, specifically the Batubara District, namely the number of Vocational High School is 22 schools.

Based on the supervisory ratio and the total of schools 1:7, it can be stated that the total ideal of Vocational High School supervisors based on the number of schools in Batubara Districts is 3 people. Whereas the remaining 6 supervisors again use the supervisory ratio and 1:40 subjects. Then it can be stated the ideal number of supervisors based on the total of subject teachers is 511: 40 = 13, meaning there are 4 supervisors lacking supervisors for subject matter teachers.

Based on the comparison between resource statements and comparison ratios between supervisors and the number of schools, it was concluded that Vocational High School supervisors based on the total of schools were not ideal. The results of calculations based on a 1:7 ratio of 22 divided by 7 are 3. The ideal is that there are 3 school supervisor teams. Each team ideally consists of 6 subject matter teacher supervisors. The ideal calculation of supervisors still needs to take into account the total ideal of supervisors based on the total of teacher subjects. The ideal number of supervisors is not yet based on the ratio of the number of schools that can affect the efforts to improve the quality of teachers in Batubara District in general.

3.1 Based on Clumps of Subjects

In addition to the supervisory needs analysis based on the total of schools is necessary also needs analysis based on the total of teachers or subjects. Analyzing is carried out based on the Minister of Administrative Reform and Bureaucratic Reform Regulation No. 21 of 2010 which states that the ratio of supervisors and teachers to subject families is 1:40. Needs analysis needs to be done even though HTY says that the number of supervisors in the Batubara District has reached 9 people (appendix 7). The JLD also stated the same thing, but a needs analysis was also needed.

The Batubara District currently has 9 Vocational School supervisors with a total of 22 schools. Based on the results of the interviews, the informants' answers were almost the same that with the number of nine vocational supervisors already sufficient supervision of Vocational High Schools in the District Education Office of Batubara. The following are the results of interviews with the General Head of the Batubara District Education Office stating that Vocational Supervisors in the Batubara District are adequate and scattered throughout the areas of the Batubara District Vocational High School. Although not all subjects in vocational schools have supervisors, especially productive subjects (appendix 5). Next, AH interviews with the Vocational High School in Batubara District Vocational High School about the distribution of Vocational High School supervisors in the Batubara District said that, the Vocational High School Supervisor was sufficient, with 22 Vocational Schools and 9 supervisors (appendix 6). Based on the interview results, it can be concluded that actually the number of Vocational High School 22 and 9 Vocational High School supervisors is not sufficient. This can be seen from not all subjects in Vocational High School have supervisors, especially productive subjects. However, according to the General Head of the North Sumatra Province Education Agency.

Vocational Supervisors in the Batubara District are sufficient. Until now the supervisors of Vocational High Schools in Batubara District have been sufficient. Even if there is a replacement later, it is because the supervisor has entered retirement (appendix 5). The same
question was also asked to AMP Vocational High School of North Sumatra Province Education Office which explained that. Vocational Supervisors in the Batubara District are sufficient, although for some fields of study are still lacking. But these deficiencies have been attempted by empowering existing supervisors. Therefore, the number of supervisors is sufficient. In addition, the performance of the Vocational High School supervisor is also good (appendix 5). The results of interviews with the KSP Vocational High School of the Provincial Education Office of Batubara District also produced the same answer, namely. The number of Vocational Supervisors in the District is sufficient. However, of course with the conditions of each region (appendix 6). Based on the results of the interviews above, it can be concluded that the needs of Vocational High Schools supervisors in Batubara District have not been fulfilled even though the informants said the ratio of Vocational High School supervisors in Batubara District was sufficient. In line with the Determination of the Minister of Empowerment of State Apparatus and Bureaucratic Reform No. 21 of 2010 has been explained in Article 6 paragraph (2) that the supervisor's target or the ratio of Senior High School/Vocational High School supervisors is 1: 7 in each subject and is included with 40 teachers. Because the number of Vocational Schools in Batubara was only 22, the Batubara District education office advised that the Vocational High School supervisors did not follow the supervisory ratio of 1: 7, but made the supervisory team based on the Vocational High School with the same majors. However, based on data obtained from the North Sumatra Provincial Education Office, the total of supervisors with the assisted teachers is still not ideal because there are still supervisors who foster teachers who are not as familiar as their subjects. For example, a supervisor who fosters a computer network engineering department (TKJ) but also fosters an agricultural department. In addition, supervisors for BK teachers do not even exist at all. The ideal number of supervisors based on the number of teachers needed can be explained as in table 4.3 below.

It can be concluded that ideally there are 3 school supervisor teams needed for the vocational level in the Batubara District. Team 1 Vocational Supervisor consists of 13 supervisors for Normative subjects (5 subjects with 1 supervisor each), Adaptive 4 people (4 subjects with 1 supervisor each), Earning 3 people, and BK 1 supervisors and team 2 consisted of 13 VOC supervisors for Normative subjects (5 subjects with 1 supervisor from team 1). Adaptive 4 people (4 subjects with 1 supervisor from team 1), and 1 person productive, plus BK supervisor (from team 1).

4 Conclusion

Based on research conducted in the North Sumatra Province Education Office and the Batubara District Education Service, can be drawn the following conclusions. (1). The total ideal of school supervisors based on the ratio of education unit supervisors at the vocational level in Batubara District if using a ratio of 1: 7 that the total of supervisors is currently sufficient. (2). The total ideal based on the required subjects is 13 people, while there are 9 supervisors. Thus this total ideal has not been achieved. Such conditions result in a lack of supervision services to teachers and principals. The implication of this condition is the need for needs analysis, as well as supervisory recruitment to meet the total ideal of supervisors. (3). Comparison of total ideal and actual based on a ratio of 1: 7, Vocational High School supervisors in Batubara District have been fulfilled with the number of 22 Vocational High Schools. While using regulation 1:40 has not been fulfilled because the total of supervisors is
currently 9 supervisors, while the total ideal is based on clumps of subjects what is needed is 13 people.

References


The Influence of Utilization of Information and Communication Technology, Career Development and Work Environment on Teacher Job Stress in SDN Cluster 1 and 3 Bandar Subdistrict, Bener Meriah Regency, Aceh Province

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Abstract. This study aims to find out: the direct effect of Utilizing Information and Communication Technology on Career Development; the direct effect of Utilizing Information and Communication Technology on the Work Environment; the Direct Effects of the Use of Information and Communication Technology on Teacher's Job Stress; the direct effect of Career Development on teacher's Job Stress; the direct effect of the Work Environment on teacher’s Job Stress. This research was conducted at SD Negeri 1 Cluster 1 and Cluster 3 Bandar Subdistrict. The study population was 193 teachers and the total sample was 123 teachers using Issac and Michael tables, with a sampling technique using Proportional Random Sampling. Data collection was carried out using a questionnaire, after an instrument trial was conducted to 40 teachers outside the sample. The data analysis technique used consisted of descriptive analysis, analysis requirements test, and path analysis with a significance level of 0.05. The results of this study indicate the Utilization of Information and Communication Technology has a positive direct effect on teacher career development, Utilization of Information and Communication Technology has a direct positive effect on the Work Environment, Utilization of Information and Communication Technology has a negative direct effect on Job Stress, Career Development has a negative direct effect on Job Stress, and Work Environment has a direct negative effect on Job Stress. To reduce the level of teacher work stress can be done by increasing the utilization of information and communication technology, career development and work environment of teachers is getting better. The greatest effect on Job Stress Teachers is the variable Utilization of Information and Communication Technology, followed by Career Development and Work Environment.

Keywords: Utilization of information, communication technology, career development, work environment, teacher job stress

1 Introduction

Job stress is a deviant condition experienced by individuals in a work environment where there is an imbalance between the ability of an individual and the demands of a job that exceeds his ability. In working, the potential to experience stress is quite high, among others, can be caused by tension in interacting with superiors, jobs that require high concentration,
workloads that are not in accordance with capacity, conditions of work environment that are not supportive, severe and unhealthy competition. This is in accordance with Gibson and James (1987) that work stress is an adjustment response, mediated by individual differences or psychological processes, which are the consequences of every action from outside (environment), situation, or event that determines the demand for psychology or physically excessive to someone [1]. In the general sense of work stress is a tension that affects emotions, thought processes, and one's physical condition. According to Kyriacou (2007), stated that teachers who experience stress during their duties and experience negative emotions such as anger, anxiety, tension, disappointment and moodiness are a threat to physical and psychological happiness. Based on the above theories, it can be concluded that the teacher's work stress is the stress that occurs in a teacher due to work, and the stress of teacher work occurs because of an imbalance between the ability of the teacher and the demands of the tasks assigned to them. Teacher work stress is characterized by characteristics: Experiencing excessive anger; Experiencing frustration; Experiencing excessive anxiety; Depressed and Experiencing anxiety. Job stress factors according to the National Safety Council (2004) are in the form of lack of autonomy, workload, job relocation, lack of training, karis development, poor relations with superiors, technological developments, increasing responsibilities without salary increases, and sacrificed workers (organizational factors), conflicts between career and family responsibilities, economic uncertainty, lack of job appreciation, work saturation, child care, and conflict with colleagues (individual factors), poor working environment conditions, sexual harassment, workplace violence, traffic jams when leaving and home work and racial discrimination (environmental factors) [2].

The reason for the use of information and communication technology (ICT) as a factor that influences teacher work stress is based on the results of preliminary observations conducted on 15 November to 15 December 2017 on 15 teachers in SD Negeri Groups 1 and 3 of Bandar Subdistrict. It is known that 73.3% of teachers experience work stress which is caused by the low ability of teachers to use information and communication technology. This is seen from: (1) many teachers are still unable to operate/ use laptops and computers, causing teachers to be unable to fill out the revised 2013 Curriculum report 2017 which has been applied in the odd semester of the 2017/2018 academic year, causing teachers to pay other people's services to fill out the report cards. (2) many teachers are still unable to make PTK as a requirement in promotion or class, causing teachers to be late in proposing group increases. (3) many teachers are still unable to use learning tools sourced from the internet because of the inability to use computers/ laptops, causing teachers to only apply learning with the lecture system.

The low effort of teachers in developing careers can be seen from: (1) the number of teachers who arrange teaching devices when they are going to rise in rank or class and when school accreditation is assessed; (2) teacher awareness to attend and leave school on time, and there is still a lack of awareness to get used to working seriously in accordance with applicable regulations, both workplace regulations and regulations that are made together as a guideline for carrying out daily activities at school; (3) The lack of interest and willingness of teachers to explore up-to-date learning resources from the internet or books and other sources; (4) The lack of the creative nature of the teacher in developing or utilizing the environment as a learning medium for students.

The school environment is not conducive, these problems arise in SD Negeri 1 and 3 schools in Bandar Subdistrict, including narrow classrooms so that the ratio between the number of students is not balanced with the size of the classroom. The narrow layout will cause a high temperature in the room, causing ineffective teaching and learning activities. In
addition to spatial and temperature management, the cleanliness of the school environment is still lacking due to a lack of awareness of students in maintaining cleanliness.

2 Methodology

This research was conducted in SD Negeri Cluster 1 and 3 of Bandar Subdistrict, Bener Meriah District, Aceh Province. The study began in April to May 2018. The population for this study were all elementary school teachers in Cluster 1 and 3 of Bandar Subdistrict, Bener Meriah Regency, Aceh Province with criteria: status as Government Employees (PNS) and honorary, and not in MPP status. Based on these criteria, the total population in this study was 193 teachers spread across SD Negeri 1 and 3 in Bandar Subdistrict consisting of 16 schools. To determine the number of samples the study was conducted using the table Issac and Michael with a level of error of 5%, if the total population is 193 people the number of samples is 123.

The data collection technique in this study is to make research instruments in the form of: Teacher Job Stress Instruments; Instruments for Using Information and Communication Technology; Career Development Instruments; Work Environment, and then conducted an instrument trial. Tests were conducted on teachers who were not included in the sample but were still classified in the study population. The method taken is to give a questionnaire to the teachers of SD Negeri 1 and 3 Bandar Subdistrict which consists of 40 teachers outside the sample. To determine whether or not the questionnaire is used, it must be tested for the validity and reliability of the questionnaire. Valid and reliable are two important requirements to determine the goodness of an instrument. And then tested the validity and reliability. Besides, there are some terms must be understood related to this theme, and so-called as a literature review, as follows.

2.1 Work Stress Essence

According to Siagian (2014) defines that stress is one of the factors that influence a person's emotions, thoughts, and physical condition [3]. Stress that cannot be overcome properly usually results in the inability of people who interact positively with their environment, both in the work environment and outside environment. Adjectives that will be used for various negative variations that occur in work performance. Whereas according to Hardjana (1994), interpreting stress as a condition or condition that is created when the transaction of people who are stressed and people who cause the people involved to see the incompatibility between conditions and conditions and psychological, psychological and social resources that exist. In simple terms, Anoraga defines the stress a person does, both physically and mentally, in terms of perceived and threatened environment.

According to Robbins, the causes of work stress are grouped into three sources, namely factors originating from the environment, organization and individuals where large grouping is similar to grouping the causes of work stress by the National Safety Council [4] however, not the same in classifying factors more detailed. More detailed causes of work stress according to the National Safety Council (2004) are in the form of lack of autonomy, workload, job relocation, lack of training, karis development, poor relations with superiors, technological developments, increased responsibilities without salary increases, and workers who sacrificed (organizational factors), conflict between career and family responsibilities, economic uncertainty, lack of work appreciation, work saturation, child care, and conflict with
colleagues (individual factors), poor working environment conditions, sexual abuse, workplace violence, congestion when leaving and returning to work and racial discrimination (environmental factors).

According to [9] define usefulness as a level where one believes that the use of a particular technology will improve the person's performance. Measurement of utilization is based on the frequency and diversity of technology used. Whereas according to [8] utilization can be in the form of the utilization of one factor such as work easier, useful, increasing productivity, effectiveness and improving job performance.

### 2.2 Career development

Stone (in Saydam) says career development is a process and activity to prepare an employee to occupy a position in an organization or company, which will be carried out in the future [5]. With this development, the definition of the company or HR manager has been compiled prior planning about the ways that need to be done to develop the employee's career while working. Furthermore, [8] suggested that career development is an employee's personal efforts to achieve a career plan. Furthermore, Samsudin stated that career development is a series (sequence) of positions / positions occupied by someone during a certain lifetime. Based on the description, the following is stated that this definition places the position / position of an employee in an organization's environment, as part of a series of positions / positions he occupies during his life [6]. [8] argues that career development is the process of improving individual work abilities achieved in order to achieve the desired career.

### 2.3 Work Environment

The work environment consists of work systems, job design, working conditions, and ways in which people are treated at work with their managers and coworkers. According to Nitisemito (1996), everything that exists around workers and can affect them in carrying out tasks that are charged [7], [6], defines the work environment as a whole tool tool and material faced, the surrounding environment in which a person works, the method of work, and work arrangements both as individuals and as a group [8]. Meanwhile according to [9], which defines the work environment as a whole work infrastructure that exists around employees who are carrying out work that can affect the implementation of the work itself [5]. According to Nitisemito, argues that the indicators of the work environment are work atmosphere, relationships with colleagues, relations between subordinates and leaders, availability of facilities for employees [7].

### 3 Result and Discussion

#### 3.1 Data Description

Data collected from 123 respondents were then analyzed descriptively by each variable by calculating the value of the central tendency and the size of its spread.

<table>
<thead>
<tr>
<th>Variables</th>
<th>UICT (X1)</th>
<th>C.Development (X2)</th>
<th>W.E (X3)</th>
<th>Stress (X4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>123</td>
<td>123</td>
<td>123</td>
<td>123</td>
</tr>
<tr>
<td>Valid</td>
<td>123</td>
<td>123</td>
<td>123</td>
<td>123</td>
</tr>
</tbody>
</table>
### Summary of Data Normality Test with the Kolmogorov-Smirnov Test

<table>
<thead>
<tr>
<th></th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>123</td>
<td>123</td>
<td>123</td>
<td>123</td>
</tr>
<tr>
<td>Mean</td>
<td>89.01</td>
<td>98.21</td>
<td>114.02</td>
<td>115.93</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>7.607</td>
<td>11.017</td>
<td>10.169</td>
<td>11.976</td>
</tr>
<tr>
<td>Absolute Differences</td>
<td>.075</td>
<td>.057</td>
<td>.083</td>
<td>.058</td>
</tr>
<tr>
<td>Positive</td>
<td>.062</td>
<td>.057</td>
<td>.083</td>
<td>.058</td>
</tr>
<tr>
<td>Negative</td>
<td>-.075</td>
<td>-.055</td>
<td>-.069</td>
<td>-.048</td>
</tr>
<tr>
<td>Kolmogorov-Smirnov Z</td>
<td>.830</td>
<td>.630</td>
<td>.922</td>
<td>.643</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.496</td>
<td>.822</td>
<td>.363</td>
<td>.803</td>
</tr>
</tbody>
</table>

Information:
- X1 = Use of Information and Communication Technology
- X2 = Career Development
- X3 = Work Environment
- X4 = Job Stress

3.2 Measurement of Input Analysis

In quantitative research with a path analysis approach, as explained in the methodology section that before the analytical technique chosen to test the research hypothesis, it is necessary to examine the requirements of the analysis.

3.2.1 Normality Test
3.2.2 Linearity Test and Meaning of Regression Equations

Table 3. Summary of Linearity Test and Meaning Test

<table>
<thead>
<tr>
<th>No</th>
<th>Exogenous variable against</th>
<th>Linearity Test</th>
<th>Regression Meaning Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$F_h$</td>
<td>Sig.</td>
</tr>
<tr>
<td>1</td>
<td>$X_1$ with $X_2$</td>
<td>1,419</td>
<td>0,103</td>
</tr>
<tr>
<td>2</td>
<td>$X_1$ with $X_3$</td>
<td>1,511</td>
<td>0,068</td>
</tr>
<tr>
<td>3</td>
<td>$X_1$ with $X_4$</td>
<td>1,223</td>
<td>0,230</td>
</tr>
<tr>
<td>4</td>
<td>$X_2$ with $X_4$</td>
<td>1,385</td>
<td>0,109</td>
</tr>
<tr>
<td>5</td>
<td>$X_3$ with $X_4$</td>
<td>1,031</td>
<td>0,442</td>
</tr>
</tbody>
</table>

Information:
$X_1$ = Use of Information and Communication Technology
$X_2$ = Career Development
$X_3$ = Work Environment
$X_4$ = Job Stress

3.2.3 Testing of Research Hypotheses

Testing the analysis requirements in this study has been fulfilled, so that the research hypothesis testing can be continued to prove and provide answers to the problems that have been formulated in the study.

Table 4. Summary of Results of Correlation Coefficient Calculations, Path Coefficients and Meanings

<table>
<thead>
<tr>
<th>No</th>
<th>Variabel</th>
<th>Coefficient Correlation*</th>
<th>Coefficient Lane</th>
<th>Counted</th>
<th>Significant</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$X_1-X_2$</td>
<td>0,513</td>
<td>0,513</td>
<td>6,547</td>
<td>0,000</td>
<td>Significant</td>
</tr>
<tr>
<td>2</td>
<td>$X_1-X_3$</td>
<td>0,525</td>
<td>0,525</td>
<td>8,605</td>
<td>0,000</td>
<td>Meaningful lane</td>
</tr>
<tr>
<td>3</td>
<td>$X_1-X_4$</td>
<td>-0,476</td>
<td>-0,268</td>
<td>-2,677</td>
<td>0,008</td>
<td>Meaningful lane</td>
</tr>
<tr>
<td>4</td>
<td>$X_2-X_4$</td>
<td>-0,406</td>
<td>-0,202</td>
<td>-2,237</td>
<td>0,027</td>
<td>Meaningful lane</td>
</tr>
<tr>
<td>5</td>
<td>$X_3-X_4$</td>
<td>-0,406</td>
<td>-0,198</td>
<td>-2,169</td>
<td>0,032</td>
<td>Meaningful lane</td>
</tr>
</tbody>
</table>

*All Coefficient Correlation Significance ($t_{haung}$) are bigger than aritabel (5%) = 1,645

Information:
$X_1$ = Use of Information and Communication Technology
$X_2$ = Career Development
$X_3$ = Work Environment
$X_4$ = Job Stress

4 Conclusion

Based on the proof of the hypothesis proposed in this study, further conclusions can be put forward as follows:

a. Utilization of Information and Communication Technology has a positive direct effect on the Career Development of teachers in SD Negeri Cluster 1 and 3 Bandar Subdistrict, Bener Meriah Regency, Aceh Province. In other words, the better the utilization of Information and Communication Technology, the better the Career Development of Teachers of Primary Schools in Groups 1 and 3 of Bandar Subdistrict, Bener Meriah District, Aceh Province.

b. Utilization of Information and Communication Technology has a positive direct effect on the working environment of teachers in SD Negeri Cluster 1 and 3 in Bandar Subdistrict, Bener Meriah Regency, Aceh Province. In other words, the better
the utilization of Information and Communication Technology, the better the Teacher's Work Environment SD Negeri Cluster 1 and 3 Bandar Subdistrict, Bener Meriah Regency, Aceh Province.

c. Utilization of Information and Communication Technology has a direct negative effect on teacher work stress in SD Negeri Cluster 1 and 3 in Bandar Subdistrict, Bener Meriah Regency, Aceh Province. In other words, the higher the utilization of Information and Communication Technology, the decreasing Teacher Job Stress SD Negeri Cluster 1 and 3 Bandar Subdistrict, Bener Meriah Regency, Aceh Province.

d. Career Development has a direct negative effect on teacher work stress in SD Negeri Cluster 1 and 3 Bandar Subdistrict, Bener Meriah Regency, Aceh Province. In other words, the better the teacher's career development, the lower the teacher's work stress SD Negeri Group 1 and 3 Bandar District Bener Meriah District, Aceh Province.

e. Work Environment has a direct negative effect on teacher work stress SD Negeri Cluster 1 and 3 Bandar Subdistrict, Bener Meriah Regency, Aceh Province. In other words, the higher the teacher's working environment, the lower the teacher's work stress SD Negeri Cluster 1 and 3 Bandar sub-district, Bener Meriah district, Aceh province

References

The Portrait of The Effectiveness of KKNI-Based Curriculum Implementation as An Internalization Efforts in The 21st Century Skills in Medan State University

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{* faisalpendas@gmail.com }
Faculty of Education, Medan State University

Abstract. This study aims to describe the effectiveness of KKNI-based curriculum implementation as an effort to internalize 21st century skills at Medan State University. The focus of the research study is the effectiveness of the implementation of the 6 KKNI tasks, namely: routine assignments, Critical Book Report (CBR), Critical Journal Review (CJR), engineering ideas, projects, and mini research. This research is a descriptive quantitative research, with a sample of 280 students from all state faculties at Medan State University. Data were collected using observation and questionnaire, then analyzed using descriptive statistics. The results showed that the effectiveness of KKNI implementation was obtained on average 3.33 (83.25%) in the Good category. That is, the implementation of the KKNI-based curriculum has gone well at the State University of Medan.

Keywords: Curriculum, KKNI, 21st century

1 Introduction

Government regulations and provisions regarding the higher education curriculum, mandate that the curriculum must refer to the Indonesian National Qualifications Framework (KKNI) in accordance with Presidential Regulation No. 8 of 2012, namely: the competency qualification framework that can pair, equalize, and integrate education and work and work experience in the framework of providing job recognition in accordance with the work structure in various sectors. The KKNI is an embodiment of the quality and identity of the Indonesian nation in relation to the national education system, the national job training system and the national learning achievement equality assessment system, which Indonesia has to produce quality and productive national human resources.

Following up on Presidential Regulation Number 8 of 2012, Medan State University has formulated an academic service improvement program set out in the 2016-2020 Medan State University Strategic Plan. As a follow-up, each future study program should be able to determine/compile graduates learning outcomes that have the ability in the field of work, knowledge mastered and have managerial skills. For the formation of courses must pay attention to the profile of graduates, learning outcomes, study materials, and courses as well as the amount of credits. Based on this, each study program at the State University of Medan revitalizes the existing curriculum, which is about the formulation of Graduates’ Competencies
that refer to the KKNI especially at the S1 level (level 6), including: graduate profile, achievement of graduate learning according to the KKNI qualification level, and learning achievement and characteristics of university graduates.

Efforts to obtain graduates in accordance with the description of S1 graduates (level 6) above, Medan State University develops strategies for effective achievement in the implementation of KKNI-based curriculum. The strategy carried out is by giving 6 assignments to students, including: routine assignments, Critical Book Report (CBR), Critical Journal Review (CJR), engineering ideas, projects, and mini research. In its implementation, various guidelines have been prepared for the completion of KKNI tasks at the university level, both in terms of how to complete 6 tasks, and in terms of their assessment. Not only that, the selection of learning models should be based on learning approaches that are oriented to the latest learning concepts [1]–[3].

Based on observations and interviews in the field, namely in several study programs in each faculty, the implementation of the KKNI-based curriculum has not run optimally. In its implementation, there are still many students who do not understand the 6 tasks given and how to solve them. This has an impact on the low quality of the work done by students. Therefore, it is necessary to follow up in the form of in-depth study related to the implementation of the KKNI at Medan State University based on preliminary observations made.

Referring to previous research on the implementation of KKNI in higher education provides the following picture: (1) [4] on "KKNI in Learning Outcomes-Based Curriculum" explains that the KKNI provides a significant impact on improving the quality of graduates in universities, (2) [5] study of "Curriculum Implementation Studies Based on KKNI in the English Education Study Program at the LPTK in Bengkulu City" produced an overview of the mechanism of change and curriculum development carried out so far not standardized based on needs analysis (need analysis), and (3) [6] research on "Development of KKNI and Nationality-Based Education Curriculum as a Sustainability Development Support Program in Education" illustrates that the KKNI-based curriculum is capable of producing graduates who have personal competence, social competence, and intellectual competence with a nationalistic character.

Regarding the research data stated above, it is necessary to conduct a similar study on the implementation of KKNI at Medan State University. In contrast to previous studies, this research study focused more on the effectiveness of KKNI-based curriculum implementation at Medan State University, including the following: (1) student perceptions of the benefits of 6 KKNI tasks, (2) supporting factors and obstacles to KKNI implementation, (3) efforts that can be made to produce implementation of the KKNI at Medan State University.

2 Methodology

The type of research used is descriptive quantitative method. Descriptive research (descriptive research) is a research conducted to determine the value of an independent variable, either one variable or more (independent) without making comparisons, or connecting with other variables [7]. Furthermore, it was explained that descriptive research is research that aims to obtain a description of the characteristics of variables (respondent characteristics, messages to be conveyed and respondents' perceptions) [8].
The type of research conducted is policy research that has special characteristics in identifying various issues or problems that arise related to policy making and after the data is obtained, researchers conduct policy analysis based on data [2]. Therefore, the application of the KKNI-based curriculum as part of Unimed's policy needs to be reviewed by the readiness of students to follow it.

The purpose of this research is to describe the effectiveness of KKNI-based curriculum implementation at the State University of Medan. In accordance with this goal, what will be obtained from this research is descriptive data in the form of a description of students' perceptions about giving 6 KKNI assignments among them; benefits of 6 KKNI tasks, supporting and inhibiting factors, as well as the efforts made in producing 6 KKNI assignments at Medan State University.

Subjects in this study were 280 first semester students and third semester students of 2017/2018 school year with the following details: 40 people from the Faculty of Education, 40 people from the Faculty of Economics, 40 people from the Faculty of Sports Science, 40 people from the Faculty of Social Sciences, 40 people from the Language and Arts Faculty, 40 people from the Faculty of Engineering, and 40 people from the Faculty of Mathematics and Natural Sciences. The sampling technique is random sampling, based on the assumption of a homogeneous population. Homogeneity of the population is based on the knowledge that all first and third semester students have the same capacity. Data collection techniques, referring to how the data needed in research can be obtained. Sources of data obtained by researchers using observation and questionnaire techniques using data collection instruments in the form of observation sheets and questionnaire sheets were then analyzed using descriptive statistics.

3 Result and Discussion

3.1. Research Results

3.1.1 Student Perceptions of Benefits 6 Tasks of the KKNI

Many Medan State University students were involved as respondents in the study there were 280 people. The results of the analysis of student perceptions of the benefits of 6 KKNI assignments at Medan State University can be seen in Table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Task Name</th>
<th>Average</th>
<th>Percentage (%)</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Routine Tasks</td>
<td>3,4</td>
<td>85,0</td>
<td>B</td>
</tr>
<tr>
<td>2</td>
<td>Critical Book Report (CBR)</td>
<td>3,4</td>
<td>85,0</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>Critical Journal Review (CJR)</td>
<td>3,3</td>
<td>82,5</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>Idea Engineering</td>
<td>3,3</td>
<td>82,5</td>
<td>B</td>
</tr>
<tr>
<td>5</td>
<td>Mini Research</td>
<td>3,3</td>
<td>82,5</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>Project</td>
<td>3,3</td>
<td>82,5</td>
<td>B</td>
</tr>
<tr>
<td>Amount</td>
<td></td>
<td>20,0</td>
<td>83,25</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>3,33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualification</td>
<td></td>
<td>Good</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Based on Table 1, it can be explained that the average perception of Medan State University students on the benefits of routine tasks given by lecturers is 3.4 in the Good category. Students' perceptions of the benefits of CBR assignments obtained an average of 3.4 in the Good category. Student perceptions of the benefits of CJR tasks, engineering ideas, mini-research, and projects were obtained on the same average, which was 3.3 in the Good category. Thus, the perception of the students of Medan State University on the benefits of the 6 KKNI assignments given by the lecturers obtained an average of 3.33 in the Good category. That is, students have a good perception of the benefits of the 6 KKNI assignments given by lecturers at the State University of Medan.

Simply stated, the description of students' perceptions of the benefits of 6 KKNI assignments at Medan State University can be seen in Figure 2 below.

![Figure 1](image)

**Fig.1. Average Detection Efficiency for Reza (2015) Feature Extraction versus Modified Feature Extraction**

### 3.1.2 Student Perception of Supporting and Inhibiting Factors for Implementation of the 6 KKNI Tasks

The results of the analysis of student perceptions of supporting factors and inhibitors of the implementation of 6 KKNI tasks at Medan State University can be seen in Table 2 below:

#### Table 2. Results of Student Perception Analysis of Supporting and Inhibiting Factors for Implementation of the 6 KKNI Tasks

<table>
<thead>
<tr>
<th>No</th>
<th>Aspects Observed</th>
<th>Average Score</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Availability of learning resources for the implementation of 6 IQF tasks</td>
<td>3.4</td>
<td>B</td>
</tr>
<tr>
<td>2</td>
<td>Availability of supporting facilities for the implementation of 6 IQF tasks</td>
<td>3.2</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>Availability of guidelines for making 6 IQF assignments</td>
<td>3.5</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>Availability of guidelines for evaluating 6 tasks of the IQF</td>
<td>3.5</td>
<td>B</td>
</tr>
<tr>
<td>5</td>
<td>Availability of time allocation for 6 KKNI assignments by students</td>
<td>3.2</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>Availability of time to receive 6 KKNI assignments by lecturers</td>
<td>2.5</td>
<td>C</td>
</tr>
<tr>
<td>7</td>
<td>Supervision of the implementation of 6 IQF tasks by the heads of departments, faculties, and PT</td>
<td>2.4</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td><strong>Amount</strong></td>
<td><strong>22.3</strong></td>
<td><strong>B</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>3.2</strong></td>
<td><strong>B</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Qualification</strong></td>
<td><strong>Good</strong></td>
<td></td>
</tr>
</tbody>
</table>
Based on the data in Table 2, students’ perceptions of the supporting and inhibiting factors of the implementation of KKNI at Medan State University are explained as follows: (1) Availability of learning resources for implementation of 6 KKNI assignments is on average 3.4 with Good category, (2) Availability of supporting facilities The implementation of 6 KKNI assignments was obtained on average 3.2 in the Good category, (3) Availability of guidelines for making 6 KKNI assignments on an average of 3.5 with Good categories, (4) Availability of assessment guidelines 6 KKNI assignments were on average 3.5 with Good category, (5) Availability of time allocation for the making of 6 KKNI assignments by students at an average of 3.2 in the Good category, (6) Availability when examining 6 KKNI assignments by lecturers at an average of 2.5 with the category Sufficient, (7) Supervision of the implementation of 6 KKNI assignments by leaders of departments, faculties, and college is on average 2.4 with the category Enough, (8) the average results of the analysis of supporting factors and inhibitors of implementation 6 the task of the KKNI at the State University of Medan is 3.2 in the Good category. In simple terms, data exposure Table 2 can be seen in Figure 3 below.

Fig.2. Student Perceptions of Supporting and Inhibiting Factors of KKNI Implementation

Guided by data in Table 2 and Figure 3, students’ perceptions of supporting factors and inhibitors of the implementation of 6 KKNI tasks at Medan State University can be analyzed as follows.

(a) **Supporting Factors for Implementation of the 6 KKNI Tasks**

Based on the average obtained through the analysis of Table 2 before, the factors that support the implementation of the 6 KKNI tasks include:

1. Availability of learning resources for the implementation of 6 KKNI assignments is good at Medan State University;
2. Availability of supporting facilities for the implementation of 6 KKNI tasks is good at the State University of Medan;
3. Availability of guidelines for the preparation of 6 KKNI assignments has been given by lecturers at the State University of Medan;
4. Availability of assessment guidelines 6 KKNI assignments have been well provided by lecturers; and
5. Availability of time allocation for the making of 6 KKNI assignments by students is still relatively good.
(b) Inhibiting Factors for the Implementation of the 6 KKNI Tasks

Based on the average obtained through the analysis of Table 2, which is a factor inhibiting the implementation of the 6 KKNI tasks, among others:

1) Availability when checking 6 KKNI assignments by lecturers is still lacking. Based on the results of interviews with several lecturers, the cause of this could occur is the number of teaching hours by each lecturer so that the time to check the assignments is very limited.

2) Supervision of the implementation of 6 KKNI tasks by leaders of departments, faculties, and college is also still relatively low, which is at an average of 2.4 with sufficient categories.

(c) Student Perceptions of Efforts Made to Achieve Success 6 KKNI Tasks

The description of student perception of the efforts that can be done in order to achieve the successfully implementation of the 6 KKNI tasks at the state University of Medan can be seen in 3 below

Table 3. Results of Student Perception Analysis on Efforts Made to Achieve Successful Implementation of the 6 KKNI Tasks

<table>
<thead>
<tr>
<th>No</th>
<th>Aspects Observed</th>
<th>Average</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Provision of guidelines for making 6 KKNI assignments</td>
<td>3,8</td>
<td>SB</td>
</tr>
<tr>
<td>2</td>
<td>Provision of assessment guidelines for 6 KKNI tasks</td>
<td>3,8</td>
<td>SB</td>
</tr>
<tr>
<td>3</td>
<td>Ability to explain the implementation of the 6 KKNI tasks (types of bills, forms of assignments, impact if they do not work, and benefits obtained)</td>
<td>3,3</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>Provision of alternative learning resources</td>
<td>3,2</td>
<td>B</td>
</tr>
<tr>
<td>5</td>
<td>The strategy of achieving time efficiency in working on 6 KKNI assignments by students</td>
<td>3,4</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>Strategies for achieving time efficiency in examining 6 KKNI tasks by lecturers</td>
<td>3,2</td>
<td>B</td>
</tr>
<tr>
<td>7</td>
<td>Improved supervision of the implementation of 6 KKNI tasks by leaders of departments, faculties, and universities</td>
<td>3,4</td>
<td>B</td>
</tr>
</tbody>
</table>

Amount 24,1  
Average 3,4  
Qualification B

Referring to the data in Table 3, the results of the analysis of student perceptions of the efforts that can be done to achieve the successful implementation of KKNI at Medan State University can be seen in Figure 4 below:
Based on the data in Table 3 and Figure 4, the efforts made in producing 6 KKNI assignments at Medan State University are as follows: (1) Provision of guidelines for making 6 KKNI assignments is 3.7 on average with Very Good categories, (2) Provision of assessment guidelines for 6 KKNI tasks is at an average of 3.8 in the Very Good category, (3) Ability to explain the implementation of the 6 KKNI tasks (types of bills, form of tasks, impact if not working, and benefits obtained) by the lecturer on a flat 3.3 with Good category, (4) Provision of alternative learning resources at an average of 3.2 with Good category, (5) Strategies for achieving time efficiency in working on 6 KKNI tasks by students at an average of 3.4 in the category of Good, (6) Strategy for achieving time efficiency in examining 6 KKNI assignments by lecturers at an average of 3.2 in the Good category, (7) Improved supervision of the implementation of 6 KKNI tasks by leaders of departments, faculties, and PT on average 3.4 in the Good category.

Guided by the above explanation, several efforts have been made to produce the implementation of 6 KKNI tasks at Medan State University, including: maximizing the provision of guidelines for the creation of the 6 KKNI tasks, maximizing the provision of assessment guidelines for 6 KKNI tasks, maximizing explanations related to the 6 KKNI tasks, maximizing resources alternative learning, finding strategies for achieving efficiency efforts made in producing 6 KKNI tasks, referring to the level of effectiveness or success stated by [9] and of completion time and examining 6 KKNI assignments, and increasing supervision of the implementation of 6 KKNI tasks by leaders of majors / study programs, faculties, and universities.

3.2 Discussion
Implementation of 6 tasks in order to optimize the curriculum based on KKNI at Medan State University needs to be measured the effectiveness of its achievement. The effectiveness of a public policy in the field of learning is characterized by the following characteristics: (a) successfully deliver students to achieve the instructional objectives that have been set, (b) provide an attractive learning experience, actively engage students so as to support the achievement of instructional goals, (c) having facilities that support the learning process [9]. It was further explained that every minimum policy implementation program in the category of Good (Minister of Education and Culture, No. 23 of 2016).
Based on the explanation above, every aspect observed was related to the implementation of 6 KKNI assignments at Medan State University which included: (1) student perceptions of the benefits of 6 KKNI tasks, (2) student perceptions of supporting factors and obstacles to the implementation of the 6 KKNI tasks, and (3) student perceptions of the Permendikbud No. 23 of 2016. For more details, can be seen in the following description.

3.2.1 Student Perceptions of Benefits 6 Tasks of the KKNI

Guided by the analysis of the results of previous studies, obtained data descriptions as follows: (1) the average student's perception of the benefits of routine assignments given by lecturers was 3.4 in the Good category, (2) student perceptions of CBR task benefits were obtained on average 3,4 in the Good category, (3) students' perceptions of the benefits of CJR tasks, engineering ideas, mini-research, and projects were obtained with the same average, which was 3.3 in the Good category. Thus, students' perceptions of the 6 KKNI assignments given by lecturers obtained an average of 3,33 in the Good category. That is, students have a good perception of the benefits of the 6 KKNI assignments given by lecturers at the State University of Medan.

Referring to the opinion of [9] and Permendikbud No. 23 of 2016 before, student perceptions of the benefits of the 6 KKNI assignments provide a positive picture and provide an overview of the overall improvement of student competence. Thus, if viewed based on student perceptions of the benefits of the 6 KKNI tasks, thoroughly support and have a positive view on the implementation of the 6 KKNI tasks at Medan State University.

3.2.2 Student Perceptions of Supporting Factors Implementation of the 6 KKNI Tasks

Based on the average obtained through the analysis of Table 2 before, the factors that support the implementation of the 6 KKNI tasks include:

(1) Availability of learning resources for the implementation of 6 KKNI assignments is good at Medan State University;
(2) Availability of supporting facilities for the implementation of 6 KKNI tasks is good at the State University of Medan;
(3) Availability of guidelines for the preparation of 6 KKNI assignments has been given by lecturers at the State University of Medan;
(4) Availability of assessment guidelines 6 KKNI assignments have been well given by lecturers at the State University of Medan; and
(5) Availability of time allocation for the making of 6 KKNI assignments by students is still relatively good.

3.2.3 Student Perceptions of the Inhibiting Factors of the Implementation of the 6 KKNI Tasks

Based on the average obtained through the analysis of research results, which is a factor inhibiting the implementation of 6 KKNI tasks at Medan State University, among others:

(1) Availability when checking 6 KKNI assignments by lecturers is still lacking. Based on the results of interviews with several lecturers, the cause of this could occur is the number of teaching hours by each lecturer so that the time to check the assignments is very limited.
(2) Supervision of the implementation of 6 KKNI tasks by leaders of departments, faculties, and universities is also still relatively low, which is at an average of 2.4 with sufficient categories.
3.2.4. Student Perceptions of Efforts Made in Generating Implementation of the 6 Tasks of the KKNI

The results of the analysis of student perceptions of the efforts made in the implementation of the 6 KKNI assignments at Medan State University are as follows: (1) maximizing the provision of guidelines for making 6 KKNI tasks, (2) maximizing the provision of assessment guidelines for the 6 KKNI tasks, (3) maximizing explanations related to 6 tasks of the KKNI, maximizing alternative learning resources, (4) finding strategies for achieving efficiency in completion time and examining 6 KKNI tasks, and (5) improving supervision of the implementation of the 6 KKNI tasks by leaders of departments, faculties, and universities. Thus, it is hoped that the implementation of the 6 KKNI tasks will achieve success and perfection in the future in accordance with what is aspired.

4 Conclusion

Based on the results of the study, obtained some conclusions as follows: (1) Students have a good perception of the implementation of 6 KKNI tasks at the State University of Medan; (2) Supporting factors for the implementation of the 6 KKNI tasks at Medan State University can be seen through several things, including: (a) the availability of learning resources for the implementation of 6 good KKNI tasks; (b) availability of supporting facilities for the implementation of the 6 KKNI tasks that are already good at; (c) availability of guidelines for the preparation of 6 KKNI assignments that have been given by lecturers; (d) availability of assessment guidelines for 6 KKNI assignments that have been given well by lecturers; and (e) the availability of time allocation for the making of 6 KKNI assignments by students is also quite good; and (3) student perceptions of the factors inhibiting the implementation of the 6 KKNI tasks can be seen through several things, including: (a) availability when examining 6 KKNI assignments by lecturers is still lacking. (b) Supervision of the implementation of 6 KKNI assignments by leaders of department / study programs, faculties, and PT is also still relatively low, which is at an average of 2.4 with sufficient categories; and (4) Efforts that can be made in generating the implementation of 6 KKNI assignments at Medan State University can be seen through several things, including: (1) maximizing the provision of guidelines for the preparation of 6 KKNI tasks, (2) maximizing the provision of assessment guidelines for the 6 KKNI tasks, (3) maximizing explanations related to the 6 tasks of the KKNI, (4) maximizing alternative learning resources, (5) finding strategies for achieving time efficiency and examining 6 KKNI tasks, and (6) increasing supervision of the implementation of the 6 KKNI tasks by the head of the department / study program, faculties, and universities

References


Brick Cost Analysis Based on Dimensions

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Abstract. This study aims to compare the unit price of the cost of a brickworks between the bricks with size based on market and based on with Indonesian National Standard (SNI) 2008 for brick wall instalation. The sample was determined by a random sampling technique with 100 bricks that traded in Medan City. The data collection tool used is open questionnaire. Data analysis done by using descriptive statistical analysis and unit price analysis based on SNI 6897: 2008. The results found that there is a difference in the unit price of the brickworks between bricks with SNI size and brick with market size, that is 11.45%. The installation of a wall with brick size according to SNI is more cost effective compared to the of bricks with market size. This finding can be used by planner and contractor consultants as a basis for making decisions to make offers in accordance with the availability of brick materials traded in the area around the project.

Keywords: costs, bricks, dimensions

1 Introduction

The rapid development of housing is currently opening up opportunities for building materials companies to provide building materials. Bricks are one of the most widely used building materials for building walls and parapets. To determine the cost of building construction, the government made the Indonesian National Standard (SNI) 2008 as a benchmark for consultants and contractors to calculate the unit price of the budget for the cost of building materials and labor needed. The use of the analysis list is adjusted to the type of construction and materials used. The unit cost price of a standard size brickworks is planned using the unit price of the 2008 SNI budget as shown in Table 1.

Table 1. Brickworks unit price budgeting based on SNI

<table>
<thead>
<tr>
<th>Material</th>
<th>@ Rp.</th>
<th>= Rp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>70.00 Pc Machine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casted Bricks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.50 Kg Portland</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.043 M³ Sand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.30 Md Laborer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.10 Md Bricklayer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.01 Md Head Laborer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.015 Md Foreman</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Table 1 shows that for 1 m² brickwork, 70 pieces of SNI standard bricks are needed. The size of the standard SNI bricks issued by the Department of Public Works and Public Housing in 2013 is: length = 22 cm, width = 11 cm, and height = 5 cm. However, based on observations, the size of bricks traded in the city of Medan has decreased from the standard size. From each of the 3 brick sellers at locations A and B, the dimensions of the brick can be seen in Table 2.

### Table 2. Dimensions of traded bricks (Cm)

<table>
<thead>
<tr>
<th>Location</th>
<th>Length</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location A</td>
<td>18.8</td>
<td>10</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>18.3</td>
<td>9.5</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>10</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>18.5</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>Location B</td>
<td>19</td>
<td>9.5</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>9.5</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Table 2 shows that the dimensions of bricks traded have been reduced from the dimensions that based on SNI. Decreasing the dimensions of the brick will increase the number of bricks and other materials, so that the unit price of the budget increases, which will harm consumers. Therefore, the problem that being examined is: How is the effect of the unstandardized bricks to the unit price of brickworks using SNI 2008?

2 Methodology

2.1 Bricks Material Origin

Bricks are building elements made from clay and casted in the form of beams and after being burned it will become hard. Bricks are used for building walls and for foundation construction alternative material. Clay that can be used is clay containing porcelain soil mixed with quartz sand powder, iron oxide (Fe\text{2O}3) powder, and lime powder (CaCO\text{3}). Clay is taken from the soil surface. The color of the clay varies depending on the metal, aluminum, iron, and calcium oxidants they contain. Usually clay is dark brown, gray and dark blue. The use of bricks, among others, is as a wall that can protect the contents of the building [1].

2.2 Brick requirements that can be used for buildings

The bricks that will be used for buildings must meet the following conditions, namely: 1) Outside views: red brick must have sharp and angled ribs, flat sides, not cracked, and no changes in shape excessive; 2) Dimensions: according to SNI, bricks are length = 22 cm, width = 11 cm, and height = 5 cm; and 3) Compressive strength: the compressive strength of the level I brick quality is greater than 100 kg/cm\text{2}, the level II brick is 100-80 kg/cm\text{2}, and the quality of the level III brick is 80-60 kg/cm\text{2}. Brick is a basic material used as building materials that are most widely used for walls of buildings and parapets, generally brick making is done conventionally. Conventional brick making produces different sizes depending on the manufacturer [2], so that the bricks in the market have various sizes that will affect the
number of bricks used for each m² and the size of the spaces thickness. The size of standard bricks according to SK SNI 04-1989-F is as shown in Table 3.

Table 3. Bricks Size according to SK SNI 04-1989-F

<table>
<thead>
<tr>
<th>Module</th>
<th>Size (mm)</th>
<th>Length</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>M - 5a</td>
<td></td>
<td>190</td>
<td>90</td>
<td>65</td>
</tr>
<tr>
<td>M - 5b</td>
<td></td>
<td>190</td>
<td>140</td>
<td>65</td>
</tr>
<tr>
<td>M-6</td>
<td></td>
<td>220</td>
<td>110</td>
<td>50</td>
</tr>
</tbody>
</table>

According to NI 10, the biggest deviation, from the size of the bricks found in Table 3, for a maximum length of 3%, maximum width of 4% and maximum thickness of 5%.

2.3 Cost Budget

In construction work, the costs that will be incurred for a construction project must be calculated in detail, because the cost is a large investment that must be provided by the contractor in the construction phase. Accuracy in calculating volume and accuracy in determining costs is very important in planning. According to [2], the lack of thoroughness of an estimator in calculating the required budget will cause cost overruns to complete a job. The cost element required in a construction consists of labor, material, equipment, market and capital. With the control of the material used, the value of profits in a construction project will be optimally achieved by doing the work effectively and efficiently.

For data collection, survey method is used. The used tool for data collection is open questionnaire [3] consisting of several columns of length, width, and height of the bricks. The size of the brick that used as a comparison is 22 cm long, 11 cm wide and 50 cm high [4]. The study was conducted at the location of brick sales that are domiciled in Medan City. Samples totaling of 100 pieces were determined by random sampling technique [5]. For data analysis, descriptive statistical analysis techniques is used [6].

3 Result and Discussion

Based on the results of descriptive analysis of survey data, the dimensions of the bricks traded obtained an average length of 18.77 cm, width 9.58 cm, and height of 4.45 cm. These results show the dimensions of the bricks traded are smaller than the dimensions of the bricks based on SNI 6897: 2008 with the length of 22 cm, width of 11 cm, and thickness of 5 cm. Based on the analysis of SNI 6897: 2008 unit price, for the installation of 1 m² brick wall, 70 pieces are needed, with 1.5 cm spacing as an adhesive between bricks, then the number of bricks needed for the wall 1 m² becomes 10,000 / (22 + 1.5) x (5 + 1.5) = 66 pieces plus a safety factor of 6% then become 70 pieces. Whereas based on the dimensions of the traded bricks, the number of bricks needed for the wall of 1 m² with 1.5 cm spacing is 10,000 / (18.77 + 1.5) x (4.45 + 1.5) = 83 pieces plus a safety factor of 6% then become 88 and Then the unit price of bricks instalation cost based on SNI 6897: 2008 can be seen in Table 4.

Table 4. Analysis of brickwork based on the dimensions of SNI 6897: 2008

| Material | 70.00 Pc | Machine Casted Bricks | @ Rp. 550 | = Rp. 38,500,- |
Table 4 shows the unit price of brickwork cost based on SNI 6897: 2008 is Rp. 113,500,- while the unit price of brickwork cost based on the survey results is Rp. 126,500,- For details, see Table 5.

Table 5. Analysis of brickwork cost based on market dimension

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
<th>Unit Price (Rp)</th>
<th>Total (Rp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Casted Bricks</td>
<td>88.00 Pc</td>
<td>Rp. 550</td>
<td>Rp. 44,000</td>
</tr>
<tr>
<td>Portland Cement</td>
<td>14.46 Kg</td>
<td>Rp. 1,500</td>
<td>Rp. 21,690</td>
</tr>
<tr>
<td>Sand</td>
<td>0.054 M³</td>
<td>Rp. 150,000</td>
<td>Rp. 6,750</td>
</tr>
<tr>
<td><strong>Total 1</strong></td>
<td></td>
<td></td>
<td><strong>Rp. 72,440</strong></td>
</tr>
<tr>
<td>Labour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laborer</td>
<td>0.30 Md</td>
<td>Rp. 80,000</td>
<td>Rp. 24,000</td>
</tr>
<tr>
<td>Bricklayer</td>
<td>0.10 Md</td>
<td>Rp. 100,000</td>
<td>Rp. 10,000</td>
</tr>
<tr>
<td>Head Laborer</td>
<td>0.01 Md</td>
<td>Rp. 120,000</td>
<td>Rp. 1,200</td>
</tr>
<tr>
<td>Foreman</td>
<td>0.015 Md</td>
<td>Rp. 150,000</td>
<td>Rp. 2,250</td>
</tr>
<tr>
<td><strong>Total 2</strong></td>
<td></td>
<td></td>
<td><strong>Rp. 37,450</strong></td>
</tr>
<tr>
<td><strong>A. Sum Total 1+2</strong></td>
<td></td>
<td></td>
<td><strong>Rp. 109,940</strong></td>
</tr>
<tr>
<td><strong>B. Overhead and Profit 15% x A</strong></td>
<td></td>
<td></td>
<td><strong>Rp. 16,483.50</strong></td>
</tr>
<tr>
<td><strong>C. Unit Price of Work (A+B)</strong></td>
<td></td>
<td></td>
<td><strong>Rp. 126,423.50</strong></td>
</tr>
<tr>
<td><strong>Rounded</strong></td>
<td></td>
<td></td>
<td><strong>Rp. 126,500</strong></td>
</tr>
</tbody>
</table>

The difference in unit price of the brickworks between SNI 6897: 2008 and market bricks is 11.45%. This finding shows that the cost unit price analysis of SNI-sized brickworks is more economical compared to the cost of brickworks with the market size. This finding supports the findings of Mufarsis, Prihesnanto, and Darmo who found that cost budget estimates calculated based on SNI were more economical than budget estimates based on Burgelijke Openbare Werken (BOW) analysis [7]. The author agrees with Fatonah and Wulansari [8] who suggest choosing the right and accurate calculation method to obtain more efficient budgetary results. This finding provides very valuable guidance to the planner and contractor consultants as consideration for submitting an offer that is in accordance with the brick material traded in the area around the project.
4 Conclusion

Based on the results and discussion, it is concluded that the dimensions of bricks that are not in accordance with the dimensions of SNI cause a difference in the unit price of the budget for the installation of the wall as big as 11.45%. The unit price of the budget for the installation of standard size brick walls is more efficient than using bricks that are traded on the market.

References

Abstract. This study aims to discover the feasibility of booklet media with various collar construction patterns to the students of Fashion Design Study Program, Universitas Negeri Medan. Drawing the pattern construction with the breaking pattern of various collar models to be appropriate as the learning media for the students of Fashion Design Study Program, Universitas Negeri Medan. The research methodology used in this research is Research and Development method. The development model used in this study is a 4-D development model (four D models), including: define, design, develop, and disseminate. The result shows that the usage feasibility of students' booklet test results the percentage of (95.56%) which is in “Excellent” qualification; and the feasibility test with lecturer as the respondents is in (94.74%) “excellent” qualification. Therefore, the feasibility of various booklet media construction with various collar models and pattern breaking method is appropriate to be applied to the students of Fashion Study Program in Universitas Negeri Medan.

Keywords: Booklet media, pattern construction of various collar models

1 Introduction

Any efforts to improve the quality of education in order to respond to various challenges becomes important, especially in terms of globalization, the advancement of science and technology and the massive movement of experts. Thus, the competition of nation is agile and intensive that the educational institutions are demanded to be able to produce the qualified education output, have expertise and professional competencies that are ready to face global competition.

In the era of information technology, educator is not the only source of information and science. But the role of educator has turned into facilitator, motivator and dimasitator for students. In such conditions, it is expected that the educator can provide a greater role.

To effectively conduct the role, it is necessarily to increase the clear scenario in learning. Sagala (2003), claimed that learning has two characteristics. First, a learning involves a thinking process. Second, it builds a dialogist situation and a continued ask and question process to improve and enhance thinking process, in its turn the thinking process can help students in obtaining the science constructed by their selves. The improvement of curriculum is conducted in all fields including: tools or facilities of curriculum and teachers. The improvement of learning method is always conducted by finding the right learning method in
accordance with the teaching material. The use and selection of learning media aims to facilitate students in understanding the subject matter delivered by the teacher or lecturer. Dealing with the subject of constructing fashion patterns syllabus, there are many basic competencies, such as drawing various fashion patterns like; drawing various collars. To draw various constructed collars, it is needed an accuracy, patience, austerity and tidiness in order to produce innovative and varies collars. There are many materials of patterns construction while the students’ ability is still limited, therefore the achievement of students’ value is not maximum yet, in addition to, the lecturer has never used a booklet media in delivering material.

The use of appropriate media can motivate and help students in achieving the goal of learning. Learning media is a medium brings an instructional or contained of goal of teaching message or information [1]. Critos, 2013 mentions that media is one of the communication components, in which a message brings an information from a communicator to a communicant. [2], states that media is everything that can deliver and distribute a message from a source which is planned thus a conducive, efficient and effective learning environment can be produced.

Booklet is a small size book (a half of quarto paper) and thin, no more than 30 sheets contain of texts and pictures [2] Efendi (2009), booklet is a media in the form of small book containing of texts/pictures or both texts and pictures, while Prastowo (2015) claimed that booklet is a bound paper, both written and blank. Booklet learning media is a media that can be brought everywhere, booklet is easy to learn and not limited by space and time. Booklet presents frontview and rear-view images and attractive colours to motivate students to express creative ideas in designing and changing patterns based on construction.

Based on the definitions above, the problem of study is as following: How is the feasibility of booklet media in the basic competence of drawing various collars construction on Fashion Students State University of Medan?

2 Methodology

In this study, a Research and Development (R & D) was used.[3], “Developmental research, as opposed to simple instructional development, has been defined as “the systematic study of designing, developing, and evaluating instructional programs, processes and products that must meet the criteria of internal consistency and effectiveness.”

The development model used in this study was the 4-D development model (four D models). [4] divided the stages of the 4-D model include: define, design, develop, and disseminate.
3 Result and Discussion

The stages of the implementation of booklet media development research on the pattern construction of various types of collars to students of the Fashion Study Program. The needs analysis was carried out by distributing questionnaires to the students. The result showed that 100% students said that they had never used construction booklet media in various collar patterns as an effort to improve learning activity which was more effective and interesting. Whereas, the questionnaire data needs which were distributed to 71 first semester student Fashion Study Program, 62% stated strongly agree that the booklet media was used as learning media on the material of pattern construction of various types of collars. Based on this, the development of a booklet was needed in order to make it easier for students to understand the learning material and improve student learning activities. Because, based on the results of the research of Alabanachanin, the main function of the pattern: as a template for recreating the designs that have been made and refined (2016) In the next stage was identification of potentials and problems, researchers conducted a needs analysis to the lecturers by providing questionnaires of needs and conducting observation to find out the implementation of learning pattern construction of various types of collars, KKNI curriculum used, and the media used that would be developed.

The evaluation of the development of booklet media in the pattern's construction of various types of collars in general, the value of responses from fashion students was assessed as "Strongly Agree" so that no revisions were made. This could be seen from the small group test, the medium group test and large group test that experienced an increase from the students of Fashion Study program responses in table 1 below:
Table 1. Group Test Percentage Result

<table>
<thead>
<tr>
<th>No</th>
<th>Test</th>
<th>Average Percentage (%)</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Small group test</td>
<td>63</td>
<td>Agree</td>
</tr>
<tr>
<td>2</td>
<td>Medium group test</td>
<td>74.49</td>
<td>Agree</td>
</tr>
<tr>
<td>3</td>
<td>Large group test</td>
<td>90.54</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

The percentage of small group test, medium group test and large group test could be seen in Figure 2 below.

![Figure 2](image)

Furthermore, the results of the initial product development were validated by a media expert and a material expert. In its implementation, media validation and material validation assessed the booklet of patterns construction of various types of collars, then the validator provided judgments, comments and suggestions for improvements related to the aspects in the media expert validation and the media expert validation sheet. Some things, researchers asked directly and discussed with the validator about things that are related to the aspects that still needed some improvements in order to produce a feasible product that can be used for learning activities.

In the validation sheet, which was assessed by the media expert, he gave an average rating of 86.67% with the criteria of "very good", that the media was feasible because the media display and the picture were good and the menu attracted students' attention so as to create an interactive learning. Then, the material expert gave an assessment with an average of 89.5% with the criteria of "very good", that the booklet media of patterns construction of various types of collar models were feasible to use in learning activities in Fashion Design Study Program, Universitas Negeri Medan. [12] stated in his research entitled the design of collar around necklines in varied forms, the collar is one of the elements in women's clothing.
that attaches to the neck and gives beauty to the dress. The collar is one of the finishing edges of clothing that is attached to the neck. The collar has a variety of shapes, designs and sizes, and from various forms of collar design will give a distinctive impression or value to the wearer. Based on the results of product validation through a series of tests and revisions that have been carried out, the development of booklet media of patterns construction of various types of collar models were valid. Tests were carried out in four stages, namely: (1) media expert and material expert validation, (2) small group test, (3) medium group test, and (4) large group test.

4 Conclusion

Based on the results of the development research that had been carried out and the discussion that had been described, it could be concluded:

a) This development research uses booklet media of patterns Construction of various types of collar models. There are 52 types of collar models and how to make the pattern, overall obtaining an 84.67% rating in very good criteria. While from the results of validation by material expert, overall obtaining an 85.5% rating in the very good criteria.

b) Based on the results of students' responses questionnaires about booklet media patterns Construction of various types of collars models, received responses from students that 95.56% strongly agree to use booklet media because it attracted attention, motivated students and looked attractive as learning media of Fashion Education Study Program.

References


A Study on International Cooperation Information System of Universitas Negeri Medan

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Abstract. The realization of international cooperation managed by the International Office is still ineffective. The documents between parties involved is recorded in separate form of excel / word files, the process of compiling and searching data requires a long process and time. The work plan of the collaboration is also still experiencing problems, Universitas Negeri Medan (UNIMED) must require and record the desires of each party and collect the activity reports manually. This study aimed to analyze and design the web-based information systems of international cooperation in facilitating better preparation of documents, accelerate the search archives and monitor the planned activities (work plan) to foster the efficacy of international cooperation in UNIMED.

Stages and procedures for the implementation of the research includes the analysis of the documents, drafting the standard management and information systems, data retrieval, data analysis research, and design the information systems of international cooperation uses Waterfall, database design uses MySQL and the programming language uses PHP.

The results show that the existence of a web-based international cooperation information system will be very helpful in the preparation of documents, accelerate the search for archives and monitoring work plans online.

Keywords: Waterfall, PHP, MySQL, Information System, cooperation

1 Introduction

Cooperation is an activity conducted by several institutions or people to achieve goals planned together. Cooperation between instances of either the school or College is done for certain purposes, for example to program scholarships, training, research, student and lecturer exchange, curriculum mapping, increased competence, accreditation, devotion to community, or with the purpose of improving Human Resources.

The government through the Ministry of Research, Technology, and Higher Education is being encouraged to enhance international cooperation between colleges in Indonesia and foreign partner institutions. It is stated in the strategic plan of Ministry of Research and Higher Education (Kemenristekdikti) 2014-2019 that this cooperation is intended to develop the quality and capacity of universities in Indonesia towards a World Class University.

APEC (Asia-Pacific Economies Cooperation) in year 2015 on Cross-border Education Cooperation on Higher Education Program also spawned the college international cooperation covering the areas of:

a. Increased mobility of students
b. Increased mobility of researchers  
c. The increased mobility of the education providers.  
d. Increased networking of existing bilateral agreements.

As an integral part of Kemristekdikti’s strategic plan to encourage the development of Indonesian universities towards the World Class University, *Universitas Negeri Medan* is consistently facilitating cooperative programs to improve its international position as a prestigious university. To this end, the Office of International Affairs is present and encouraging as well as running programs of internationalization under the coordination of the Vice Rector Office of the areas of Planning, Cooperation and Communication. The development and implementation of the international cooperation service performed as one of the flagship program that has begun since the year 2017 pioneered as institutional Strengthening of the Office of International Affairs (*PKKUI*). The program is compiled with the main objective to encourage units involved in running programs of internationalization with the Office of International Affairs.

However, problems in the implementation of international cooperation lie not only in the identification of shared goals and methods to achieve it, but also in the achievement of the goals. Cooperation can only be organised if the benefits are expected to outweigh the consequences to be borne by each party. In accordance with its objectives, international cooperation should be aimed at improving the welfare of the parties because the relations of international cooperation can speed up the process of improving welfare and solving problems between two or more countries.

In order to realize the cooperation activities, various efforts has been done to ensure that the activities are relevant to the development of the university, in line with the Development Plan of the State University of Medan, especially in becoming one of the World Class University in the year 2025. However, the implementation of the cooperation between Universitas Negeri Medan and universities or other institutions outside the country are currently not giving satisfying results because the existing cooperation program during this time are still separated, unsustainable and yet showing the optimum impact or significant for the university.

**a. International Cooperation Problems and the Solution Strategy**

The problem of international cooperation in Unimed not only lies in the identification of shared goals and methods to achieve it, but on the device and the achievement of the objectives of the instruments used. Cooperation should provide benefits for all stakeholders. In accordance with the results of the meeting of APEC (Asia-Pacific Economies Cooperation) about Cross-border Education Cooperation on Higher Education, international cooperation in universities should include improved mobility of students, an increased mobility of researchers, mobility of education providers, and increased networking of existing bilateral agreements.

The problems in managing the development of international cooperation Unimed in meeting APEC cooperation programme are formulated as follows:

First, how to develop of the good governance of international cooperation in supporting Unimed towards the goal as a World Class University?

Second, how do the information system of international cooperation support the activities of international cooperation?
To encourage the development of the international cooperation service in Unimed, related research development in services and information systems for international cooperation need to be created as a broader interdisciplinary interests with overseas partners. Expected output in the form of service governance and development of the concept of information system field of international cooperation the standards and accountability on an ongoing basis and can be accessed through the official State University of Medan.

b. An overview of the State University of Medan

The vision of the State University of Medan (Unimed) is: to become a leading university in education, engineering industry and culture. This vision was set since IKIP Medan changed become UNIMED in 1999. The excellence in education is realized through the holding of a quality education. Basic and applied research are balanced based on the real needs of stakeholders and community-based income generate. As an Institution of Education for Teacher Training (LPTK), Unimed has a responsibility to produce quality teachers. Educational research policy must be based on the real needs in schools to enrich the field of educational materials and innovations-based learning and student active learning. As the only Public LPTK in North Sumatra, Unimed has become the center of consultation to solve problems in education, because generally the competence of graduates for all levels, types and lines of education in North Sumatra has not yet meet the SNP.

Referring to the University's vision, the Office of International Affairs (KUI) then formulate a vision of "Realizing the vision of the university to excels in the fields of education, engineering industry and culture through institution internationalization ". To realize the vision set out above, 5 missions, namely: (1) organizing quality education, research, and community service; (2) develop Unimed into teaching and research institution; (3) developing the culture of entrepreneurship; (4) the fostering of scientific culture; and (5) fostering an atmosphere of academic and organizational climate. The mission was carried out to achieve the goal of Unimed as follows: (1) produce superior graduates and professionals; (2) generate, develop, and disseminate science, technology, art; and/or (3) generate and develop innovative and productive works.

In accordance to the mission, to realize the vision of KUI and Unimed, then the missions of KUI Unimed are set out as: (1) to Facilitate a quality education service for foreign students; (2) Conducts research and publishing scientific papers internationally; (3) organizing community service lecturer and students in order to study abroad, Exchange programs, as a result of the implementation of the science and technology invention which solve excels in regional and national development; (4) implementing development programs include academic program development and research, human resources, management of the University and the promotion of the University; (5) develop a network of international cooperation; and (6) hosted foreign students service system of good quality.

Structuring research activities beginning with the determination of the direction of policy-based resolution of the stakeholders with the principle of income generating. To obtain optimal results, these activities are designed to involve the potential cost, human resources, and facilities and infrastructure. The construction of learning community and research attempted by involving scientific a strong leader, able to work hard, diligent, thorough, militant, an academic, and has an open, honest, democratic, and critical thinking.

The research field of non education geared to solving industry and tourism. The research of products expected to be empirical grounding for the industrial sector and tourism to increase the GDP. This product will serve as a cornerstone of cooperation partnerships
between Unimed with community groups, industry, and government. In addition, the research results can be used to enhance the bargaining position of Unimed in the eyes of stakeholders.

The issue of globalization certainly caused the advancement and development of science and technology. With respect to that issue and indeed the reality must put higher education in work to draw up the draft of programs and activities that would likely to be achieved. This situation led to the role of higher education institutions that had been transformed into the comparative competitive nature. So that the quality and relevance, accountability and autonomy, which is based on self assessment evaluation. noteworthy should be achieved. When development of teaching and research in Unimed excels, the institution made a commitment at the level of leadership through innovative policies.

Lecturers are directed to conduct research-based education research based on the real needs in the field. The results of such research could be used for the development of sociocultural-based learning, the design and implementation of the application of the contracts lectures, web-based learning, project-based learning, research-based learning, critical book report, portfolio teaching, and laboratory management. The research of the education system to produce effective, efficient, and quality will also be conducted to improve Unimed's role as the institution produce educators (LPTK).

1.1 International cooperation

The article 50 of the Law of the Republic of Indonesia number 12 of the year 2012 of higher education set the “international cooperation of higher education” that encourages colleges in Indonesia to develop international cooperation covering the areas of Education, research, and Community Service; and also to develop international cooperation based on equality and mutual respect by promoting science, technology, and values of humanity that gives benefits to human life. Next Article 90 of that Act States that the Organization of higher education by College of other countries can be made to the provisions of obtained the permission of the Government, non-profit, principled, cooperate with Indonesia over College Government, and give priority to citizens

The main purpose of international cooperation is to meet national interests not yet owned in the country. To that end, those countries need to fight for national interests internationally. In that regard, a collaboration is required in order to bring together national interests among countries. International cooperation carried out should at least have two main requirements: first, the necessity to respect the national interests of each of the members involved. And second, the existence of a joint decision in overcoming any problem arise. To reach a decision together, communication and consultation are required on an ongoing basis. The frequency of communication and consultation must be higher than commitment [1]

K. J. Holsti, (1988) states that international cooperation can be defined as follows:

a) The view that two or more interests, values, objectives meet each other and produce something, promoted or fulfilled by all sides at once.

b) Expectations of a nation that policies decided by other countries will help the country to achieve its interests and values.

c) Agreement on specific issues between two or more countries in order to exploit the equation of interests.

d) Set of transactional rules about future implementation of an agreement.

e) Transactions between countries to meet their needs and approval.
International cooperation was not only done between countries in an individual basis, but also between countries that take shelter in organizations or international institutions. Regarding international cooperation, Koesnadi K. said that international cooperation framework is a result of the relationship of interdependence and growing complexity of human life in the international community [2].

Holsti KJ (1988) in International Politics, A Framework for Analysis also argues that: “International relations may refer to all forms of interaction between the members of separate societies, whether sponsored by the government or not, the study of international relations would include the analysis of foreign policies or political processes between the nations, however, with its interest in all facts of relations between distinct societies, it would include as well studies or international trade, transportation, communication and the development of international values and ethics”.

There are several goals of cooperation in the field of higher education which is carried in the meetings of APEC (Asia-Pacific Economies Cooperation) about “Cross-border Education Cooperation in Higher Education”, which are: increased mobility of students; the increased mobility of researchers; the increased mobility of the giver of the education service (education providers); increased networking of existing bilateral agreements.

The implementation of international cooperation not only lies in the identification of shared goals and methods to achieve it, but lies in the achievement of the target. Cooperation will also be sought if the benefits are expected to outweigh the consequences should he bore. In accordance with its objectives, international cooperation aimed at improving the welfare of together. Because of the relationship of international cooperation can speed up the process of improving welfare and solving problems between two or more countries.

1.2 International Cooperation the State University of Medan

To support Unimed towards its goal as a World Class University in 2025, facilitating consistent programmes of international cooperation for improving its bargaining position in the eyes of the world is one if its main duties as an international institution. One of the flagship program that has begun since the year 2017 pioneered is a program of institutional Strengthening of the Office of International Affairs (PKKUI). The program is compiled with the main objective to encourage units involved in running programs internationalization through the Office of International Affairs, under the Office of the Vice Rector of Planning, Cooperation and Public Relation.

International cooperation in Unimed is defined as the cooperation between Unimed with other colleges or institutions abroad. The range of the programs may vary from staff exchange, student exchange, joint research, publishing papers together in joint publication, joint supervision to the organization of scientific meetings, students’ internship, provision of scholarship and the utilization of shared resources.

The programs of international cooperation are specifically aimed at preparing students to take parts as member of global society Unimed supports world peace through internalization while enhancing and strengthening nationalism. In this regards, international cooperation aims to:

a. Improving the quality of graduates Unimed in building knowledge-based society that are able to enter the job market with an international multi-lingual skills, communication skills, negotiation, cultural understanding and diplomacy between countries,

b. Promote the development of knowledge-based economy, and
c. Increase the ability of Indonesia and to answer the challenge of human development and the achievement of Sustainable Development Goals (SDGs).

The Organization of Compulsory Cooperation Programs meet the conditions outlined in the General Administration of Higher Education, the provisions of national law, and international law in force. The Organization of the International Cooperation Program is implemented based on 5 principles:

1) Give priority to the interests of national development and contribute to the improvement of the nation competitiveness;
2) Equality and mutual respect, which means that Unimed build partnership with other universities or institutions abroad with the aim of improving the performance of higher education programs. Therefore, the partnership can only be implemented when the overseas colleges have registered and accredited by a recognized accrediting agencies in the country.
3) Added value in terms of improved quality of education, meaning that the cooperation should be built in an innovative, creative, synergistic, and fill each other in order to provide added value in the form of an increase in the quality of higher education in Unimed;
4) Sustainable, means cooperation should provide equal benefits for Unimed and parties who cooperated and implemented on an ongoing basis. Cooperation should also give benefits to stakeholders and contribute in building peace, national and/or international. In addition, cooperation should also be extended to other parties;
5) Diversity, meaning that cooperation should consider cultural diversity that can be cross-regional, national and/or international.

The scope of this research is limited to the development of the conceptual design and specification of system requirements. Research results can be followed up with further activities such as the detailed design, system development, testing and training.

Stages of research are divided into 3 parts namely the identification of needs, the current service evaluation and recommendations the new system with the scope as follows:

Stages of research are divided into 3 parts, namely the identification of needs, the current service evaluation and recommendations the new system with the scope as follows: To get requirements from stakeholders related to the service and information system cooperation abroad; to evaluate the Standard Operation Procedures and identify the role of the information systems services for international cooperation; to evaluate the status of the service and the existing information system; to develop a conceptual design of the information system of international cooperation; to draw up recommen-dations for the stages of development of information system of international cooperation in the future.

The problems faced by the international office of Unimed is the weak governance and information system services that can interfere with the purpose of Unimed towards World Class University. This is due to unsufficient handling of document governance and information system of international cooperation. The expected products of this research are the realization of international cooperation and governance of information systems for international cooperation. To boost the publication of Unimed, the another output of this research is the publication in national or international journals. This will greatly contribute to the development of international cooperation that will have significant impact towards Unimed as a World Class University.
2 Methodology

The methods used in this research is a method where the waterfall approach is done systematically and sequentially in software development, beginning with needs analysis stage, the stage of planning, modeling, construction as well as the delivery of software/system information to the user [1].

In this research the steps do not come to the delivery of the software to the user. The steps used in this stage are the requirements, analysis, design, coding and testing. As for the explanation is as follows:

First, requirements. At this stage, data collection and determination of the system needs to be built by observation, interview and study of literature. The observation is done by doing a direct observation on the research object, in this case, cooperation partners, stakeholders on matters relating to the MoU process. The interview was conducted to the staffs of International Office to find out about the agency profile, information and cooperation of other things that needed to be clarified related data collection. A literature study was also conducted to find reference theories that are relevant to this study. Reference used comes from books, journals, articles, research reports or websites on the internet that deals with the design and creation of information system of international cooperation at Unimed.

Second, analysis. At this stage the system flow analysis performed the same work in progress at UNIMED then conducted an analysis of the data obtained to produce the things that are required for the software to be built in manufacturing information system international cooperation in UNIMED.

Third, design. At this stage, the translation of needs or data that has been analyzed for information system of international cooperation will be done to further design the user interface or display system in a way to make it easy to use by the user.

Fourth, coding. At this stage, the data for problem solving feature that has been designed will be translated into a programming language. The programming language used is PHP.

Fifth, testing. The last stage of testing is done with the Black Box method and trial against information system web-based cooperation to see the compliance with the needs of the stakeholders work together and to find whether there are still mistakes by doing testing in the form of User Acceptance Test.

2.1 Research Procedure

This research procedure will be divided into three parts, where there are several stages that need to be performed on each part. The following is a description of each section:

Identification of Needs. This took place in the early stages. At this stage, the needs of the service activities of the system to be implemented will be collected. The output of this stage is the progress report which includes a list of features and functions that will be implemented.

Interview. In order to collect requirements from all parties contribute, some universities abroad involved in the cooperation will be interviewed. The output of this process is a transcript of the interview that will be used as input to the next process.

Mapping service model. The entire transcript of the interviews conducted with stakeholders will be interpreted into technical and terminology that will be mapped into a model of the information service. The output of this process will be discussed in an FGD attended by policy makers at university level. FGD needs to be done to ensure that the process of the activity that has been modeled is in accordance with a model of the actual activities in the system.
2.2 Evaluation of the current governance and information systems

In understanding the situation of international cooperation system that exists today, the observation on the situation in the field needed to be done. In this section, the research team will examine the SOP to get basic information from a service that is already done. The output of this part is a document that describes which information technology can play a role in international cooperation framework.

Review of current SOP. The current Standard Operation Procedure (SOP) needs to be examined to get a better understanding on the interaction of the existing systems. By doing a study on the SOP, it can be expected that the larger picture of how the system is running at the moment is obtained. The results of the study will provide sufficient information related to interaction patterns that exist today. This information will be used to create a baseline of the system. Thus, it can be seen that the contribution of information technology that required a new system may not function as expected. Conceptual Design can be compiled based on the information obtained from this stage.

2.3 The Development of International Cooperation Information Systems

Specifying the features and functions of the information system. Based on the results of the previous phases, the obtained informations are about what are the features of the foreign partners need and how the existing system is currently running. It will recommendations of the new system for the framework of cooperation services abroad will be drawn up. The output of this part is the specification of the application information system that will be developed, which contains a list of the features and functionality of the system and how they should interact with its users [2].

Concept Design Recommendations was drafted based on the specifications of the foreign cooperation information systems that have been developed previously. In order to realize the concept design, some steps will be compiled and taken for implementation: (1) two limited tests were carried out on small groups; and (2) field tests (testing fields).

3 Result and Discussion

The current system that is running in UNIMED on organizing cooperation could not be said to be optimal. Currently, the data between the organizer of cooperation and the parties involved are noted in the form of word/excel files separately and have not integrated with each other so that the process of data retrieving in a specific time period requires a long process and time.

Preparation of the working document is the same as Letter of Intent (LOI), a Memorandum of Understanding (MoU) and a Memorandum of Agreement (MoA) or n. agreement also experience obstacles because the data organizer still separated and not yet well organized. When there is a lack of data in the preparation of the document then the international office should contact the related institutions to find the missing information and rearrange the new document formats. In addition, the plan of activities (work plan) done by the organizer of cooperation still have plenty of constraints. UNIMED must communicate intensively through various platforms to get the work plan clear.
After the agreement held, documents relating to the same work scanned and saved again. When required by the user then to look back manually. This requires a very long time waiting. International cooperation information system is a great alternative to help manage data and documents relating to cooperation. In this information system will be developed that is based website. The organizer of cooperation can access account information and see the International Office anytime and from anywhere [3]. This is very helpful International Office in optimizing data management, drafting documents and archive documents for various purposes in UNIMED.

3.1 System Requirements Analysis

3.1.1 User needs analysis

User needs analysis on information system of cooperation based on the results of the interview are as follows:

a) Admin
1. Need for login form
2. Are expected to show the number of new applicants, the filing of new cooperation, the total number of partners and UNIMED news on dashboard of Admin.
3. Manage registration data partners of cooperation.
4. Do the filing.
5. Perform management and submission discussion cooperation.
6. Template document management.
7. Generate and print the document.
10. Perform data management news cooperation.
11. Manage data on borrowed MoU documents.

b) Partners
1. Need for registration form.
2. The need for login form.
3. Able to see and offer information, news about the number of partners and UNIMED.
4. Able to see the data of partners
5. Filing of a form of cooperation.
6. Confirm discussions and cooperation.
7. Perform management and discussion of work plan.
8. Print documents of cooperation.
9. Download file from archive.

3.1.2 Functional Need Analysis

A functional needs analysis in information system of cooperation are as follows:

a) Admin
1. Admin can manage the registration data.
2. Admin can manage data submissions.
3. Admin can manage data workplan.
4. Admin can manage the data template documents.
5. Admin can do generate documents.
6. Admin can manage the archived data.
7. Admin manage data news.
8. Admin can manage data on loan documents.
9. There is a comment form for discussions on submissions and work plan of cooperation.

b) Partners
1. Login functionality for each user.
2. The partner can do the registration.
3. The partner can do the same work.
4. Partners can view documents and data archives.
5. There is a comment form for discussions on submissions and work plan of cooperation.

3.1.3 Analysis Of Non-Functional Requirements
Non-functional needs analysis in information system of cooperation are as follows:

a) display the alert on a specific action action.
b) Use responsive template.

3.2 The Draft Infrastructure
Infrastructure of information systems of cooperation in conducting the two entities have access to System i.e. Admin and partners. Partners can register into the system, once verified by admin next partners can fill the work plan and view information, while Admins can manage, print, archive documents and after that the MoU signed by both documents parties.

As for the data that flows from the Admin's are data entities login, account verification data registries, data template documents, filing data collaboration, data submission and discussion of the work plan, the data archive of documents, data and news data document the borrower's cooperation [4]. In addition to the data that flows from the partners is registration data collaboration, data, documents, data, data, workplan discussions, news and data collaboration [5].

a. Implementation of the System
1. Login page.
   Login page taking text input as username, password and verification. The system classifying level users. The user as Admin would be directed into the system Admin as user as Partners will be directed into the page system Partners.
2. Registration page. Interface
   a. On the registration, the Registrar is able to fill in the registration form data, upload the logo of the institution and complying with the registration statement. In addition on this page are also available knobs for heading home page.
   b. The Admin Dashboard and partners.
      After the Admin login successfully then the first page shown is the Admin dashboard page. On this page there is a registrant verification menu, menu, menu account management create a new submission, the submission confirmation menu, menu management, generate cooperation and archive the work plan, menu, menu management news and menu of loan documents. DASHBOARD view partners, partners can see information about the self profile, a link to the partner institution partners and partners can view information from faculty or MoA bid unit at UNIMED as well as
news and documentation cooperation. The menu in the dashboard main menu i.e. the Partner page, menu, menu edit partner profile profile, view menu, menu partners create new filing, the menus offer cooperation, document and archive menu, menu and menu news workplan.

c. Display the management Work Plan. On the page Work Plan, users can view, add, upload, and delete the archived data in accordance with the filing. Furthermore, in this page users can also discuss about the work plan based on the submission of the same work.

Generate a Display and print the document. Admin can print or save the document after you successfully generate documents. Partners that terlibat dalam filing a partnership can also save and print a document of cooperation.

4 Conclusion

Based on the results of the design in this research, the following conclusions are: Information systems organized international cooperation can help in preparing documents statement of cooperation between organizers involved in the submission of the same work. This cooperation information system can save the archives document the statement of cooperation which UNIMED has done with partners. Cooperative information systems can assist in creating a work plan that can be monitored online.

Suggestions

As for suggestions that can be done if the system is used are:

a. System security must be observed so that the system can be maintained from other parties who are not interested.

b. Need to be made of the existence of the system back up and restore the database to back up or manage database.

c. Need to be made of the existence of the notification notice the latest activities to facilitate the checking or confirmation activities.

References


The Effect of Cooperative Integrated Reading and Composition (CIRC) Learning Models Flash Media Assisted on Bahasa Learning Outcomes in Grade V Primary School

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Abstract. The Effect Of Coopertative Integrated Reading And Composition (Circ) Learning Models Flash Media Assisted on Bahasa Learning Outcomes In Grade V Primary School. This research aims to see the effect of using Cooperative Integrated Reading and Composition (Circ) Learning Models Flash Media Assisted on Bahasa Learning Outcomes In Grade V State Primary School 101776 Sampali. The technique of hypothesis testing is done using t-Test. On the pretest data normality test with the provisions Lcount < Ltable = 0.161 < 0.173 in the control class, while the experimental class = 0.154 < 0.173 so that it can be stated that the two groups of samples are normally distributed. In the normality test the postest data is known Lcount < Ltable = 0.167 < 0.173 in the control class, while the experimental class = 0.150 < 0.173 so that the data is normally distributed. In testing the homogeneity of the pretest data is known by the provisions Fcount < Ftable = 1.228 < 1.983, and the data homogeneity of postest = 1.178 < 1.983 so that it can be concluded that the two groups of data have the same variance. Then a t-test is performed with a significant level of 5% which shows that there is a significant influence on learning using the Coopertative Integrated Reading and Composition (Circ) Learning Models in Bahasa subject to poetry writing skills of students of Grade V State Primary School 101776 Sampali 2017/2018 Academic Year with tcount > ttable = (3.317 > 2.012). So it can be concluded that there is a significant influence on the use of Cooperative Integrated Reading And Composition (Circ) Learning Models Flash Media Assisted on Bahasa Learning Outcomes In Grade V State Primary School 101776 Sampali 2017/2018 Academic Year.

Keywords: CIRC learning models flash media assisted, bahasa

Introduction

In essence, education aims to humanize humans (humanization) and develop the potential that exists within humans themselves. Education is a form of implementation of a goal that a country wants to achieve. And one indicator of the implementation of education is through the learning process in schools and universities. So, education is closely related to learning.

Learning also will not stay away from objects that will be taught, namely students. Basically, students are social beings, so there must be interaction and communication with other students. Regarding the statement above, to form competent students in various fields,
the role of language has a big role in it, because language is an important communication tool in everyday life.

Ideally to harmonize the quality of education requires innovation in the learning process. In fact, in Indonesia innovation in the learning process is still less than optimal. One of them is in Public Primary School 101776 Sampali. The learning system should be more advanced than the previous era. One way to anticipate the innovation of learning by utilizing learning models and technology-based learning media as a tool for teaching and learning. At present technology has become part of human life that is able to facilitate the survival of humans, as well as in education. The use of learning media can save teaching preparation time, increase student learning motivation and reduce students' misunderstanding of the explanations given by the teacher. The policy on the use of Information and Communication Technology is contained in the Republic of Indonesia Minister of Education and Culture Regulation (Permendikbud) Number 65 of 2013a concerning Standard and Secondary Education Process Standards in paragraph 13, namely "the use of information and communication technology to improve the efficiency and effectiveness of learning".

Based on observations at Public Primary School 101776 Sampali conducted by researchers, showed that V-A class with a total of 25 students consisted of 15 male students and 10 female students and V-B class with a total of 25 students consisting of 17 male students and 8 female students, from 50 students in class V-A and V-B only 30% of students who get grades >70 while 70% of other students get a score of <70-40, this shows that only 30% of 50 students who are able to achieve the minimum completeness criteria are at a value of 70. This is because the teacher has not been maximal in guiding students, has not been able to create students' interest in learning and is weak in attracting students' attention to listening to material explanations.

At the time of learning students are less interested in learning so that students make noise, chat with friends, and do not pay attention to ongoing learning, because teachers still apply the learning model that is still teacher-centered (Teaching Center). Another factor is the lack of use of technology-based learning media in teaching so that it becomes difficult to understand, other than that students lack intensive training, students still rely on group mates, lack of seriousness and perseverance of students following the learning process, so students feel difficulties in solving problems Indonesian language with the constraints that have been described, then students feel bored and not eager to take lessons, lack of desire to know, and not care about the value obtained. In various problems that occur in the field, the teacher's role and attention is needed to improve the situation to be better through learning models and supporting learning media.

Everything that can help the teaching and learning process can be used as a learning medium. The use of technology in this case means that facilitates the continuation of the world of education. Technology makes it easy to deliver learning material to students. Utilizing technology as an educational support tool is an effort to improve teacher professionalism and student learning outcomes.

By seeing the fact above, the researcher will do an action to give the influence for the problem by changing the learning situation and involve active student, think critically, creative, and can push the student to develop courage in giving argument and ability in working together in solving a problem in the learning process. One of the Learning Models Flash Media to create the learning process to student-centered (student oriented) one of that is learning model Cooperative Intergrated Reading and Composition (CIRC) with the media flash.
2 Methodology

The type of research used in this study is a quasi-experimental research using nonequivalent control group design. Nonequivalent quantitative control group design research is a study that compares the pretest and posttest values between the experimental class and the control class. [1]. [2] added "If the subject is less than 100 people, all samples are taken. Furthermore, if the subject is more than 100, then the sample can be taken from 10-15% or 20-25% or more." The population of this study were all fifth-grade students of Public Primary School 101776 Sampali 2017/2018 Academic Year which consisted of 50 students.

<table>
<thead>
<tr>
<th>Class</th>
<th>The number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-A (Control Class)</td>
<td>25</td>
</tr>
<tr>
<td>V-B (Experiment Class)</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>50 Student</td>
</tr>
</tbody>
</table>

3 Result and Discussion

The Meaning Of Learning according to [3] states "learning is a business process carried out by a person to obtain a new behavior change as a whole, as a result of his own experience in interaction with his environment". The purpose of trying is in the form of activities, so learning is an activity carried out by learners that is done intentionally so that there is a change in the ability of individual learners from those who do not know to know and from those who do not understand to understand. Furthermore, [4] state that the characteristics of learning, namely: (1) the learning process must experience, act, react and transcend. (2) through a variety of experiences and subjects centered on a particular goal. (3) meaningful to certain lives. (4) sourced from needs and goals that encourage equilibrium motivation. (5) influenced by nature and environment. (6) influenced by individual differences. (7) take place effectively if the desired experiences and results are in accordance with your maturity as students. (8) the best learning process is if you know the status and progress. (9) functional unity of various procedures.

Learning outcomes are influenced by cognitive where students' attitudes in undergoing the learning process, and affective namely student interest in working on the direction that the teacher conveyed to the learning process and psychomotory related to student skills. [5] says that in terms of results, the learning process is said to be successful if there is a positive behavior change in the students as a whole or most (75%), so an indicator that makes it a benchmark in stating that a learning process can said to be successful, based on the provisions of the enhanced curriculum that is currently used is covering the following: (1) a minimum of 75% of the contents and principles of learning can be understood, accepted and applied by students and teachers in the classroom. (2) a minimum of 75% of students feel they have the ease, enjoyment and high willingness to learn. (3) students participate actively in the learning process. (4) material that is communicated according to the needs of students and they
consider that it will be very useful for their future lives. (5) the learning that is developed can foster students' interest in learning to learn more.

So, from the explanation above, it can be concluded that the learning outcomes are the abilities that students get both in terms of cognitive, affective and psychomotor aspects obtained through learning experiences and influenced by internal and external factors of individual learners. The learning process certainly involves a variety of factors that are very complex, because every individual who learns must occur because of the impulse from within himself, as well as the impulse from outside himself. Therefore, each factor needs to be considered so that the learning process can succeed in accordance with the stated goals. According to [6], the factors that influence learning are: 1) internal factors (factors within students), namely the physical / spiritual condition/ condition of students; 2) external factors (external factors of students), namely environmental conditions around students; 3) learning approach factors (approach to learning), namely the type of student learning efforts that include strategies and methods used by students to study the subject matter.

Language skills have four components that influence each other. The four components are listening, speaking, reading, and writing. These four language skills can be obtained by training properly and correctly. The language skills consist of interrelated productive and receptive skills, these four skills according to [7] are: (1) listening skill is the skill to understand and interpret messages delivered orally by others. (2) speaking skills are the skills to convey messages orally to others. (3) reading skills are skills to understand and interpret messages delivered in writing by others. (4) writing skills are the skills to convey messages to other parties in writing.

Linguistic learning in primary schools is integrated in language skills, such as listening, speaking, reading, and writing. These four aspects are integrated when learning must be provided in a balanced and integrated way to achieve the objectives of learning Indonesian language that has been included in the competency standards of the Indonesian Primary School language subjects. Learning model is a benchmark for achieving learning objectives, because learning models can determine the learning process that takes place. Of course, you must pay attention to the characteristics of subjects so that they are appropriate to be applied to one of the learning models. Understanding the learning model according to [8], "learning models are patterns that are used as guidelines in planning learning in class / tutorial". A pattern used as a guide for planning learning in the classroom to determine learning devices. Cooperative learning is learning that refers to learning methods where students work together in small groups and help each other in learning. In cooperative learning generally involves groups consisting of 4 students with different abilities and different sizes. One type of cooperative learning is CIRC (Cooperative Integrated Reading and Composition) which specifically teaches reading and writing techniques at the primary and secondary school level. According to [9] said that "CIRC is an integrated composition of reading and writing cooperatively in groups. The syntax is to form a heterogeneous group of 4 people, in this group not distinguished by gender, ethnicity / nation, or level of intelligence of students. and in this group, there should be students who are smart, moderate, or weak, and each student should feel suitable for each other. With group learning, it is hoped that students can improve their critical, creative, and fostering a high sense of social. Before a group is formed, students are taught how to work together in a group. Students are taught to be good listeners, can explain to friends in groups, discuss, encourage other friends to work together, respect the opinions of other friends, and so on. The advantages of the CIRC model according to is [10] : (1) improve students' skills in solving problem solving problems, because students are given prose texts as illustrations to facilitate students in expressing ideas. (2) teacher dominance in
learning is reduced, because in this learning emphasizes student activity. (3) students are motivated by results carefully, because in the group concerned with the role of each individual to work. (4) students can understand the meaning of the question and check each other's work because students are given prose texts and asked to find the main themes and ideas for poetry. (5) helping weak students, in learning each individual helps each other so that the results achieved will be good. (6) improve learning outcomes, especially in solving problems in prose texts.

The implication of applying the CIRC learning model is one of which is the realization of a student-centered learning process that can train in building collaboration, critical thinking, respecting opinions and courage and will affect student learning outcomes.

In addition to the CIRC model, it is more innovative when combined with technology-based media where this media is in the form of games. Game means game, the term game according to its meaning is a particular situation or condition when someone is looking for pleasure or satisfaction through activities or activities. [11] "Educational games are learning media that can improve understanding quickly because they are supported by interesting games and children become active". So, it can be concluded that educational games are a computer game that contains educational material in the form of interactive games as a medium for learning and can improve understanding quickly. According to Susilana in his book Learning Media: Nature, Development, Utilization, and Assessment in general the learning media has uses, among others [12], as follows: (1) Clarifying the message so that it is not too verbalistic; (2) Overcoming the limitations of space, time, energy and sensory power; (3) Generating learning passion, more direct interaction between students and learning resources; (4) Allows children to learn independently according to their talent and visual auditor and kinesthetic abilities; (5) Give the same stimuli, equalize experiences and give rise to the same perception.

Educational learning in elementary school is learning that requires student activity (student active teaching), not teacheractive teaching. Learning orientation is not on the teacher (teacher centered) but student-centered. According to [13] "Macromedia Flash is a product of Macromedia, which is an animation-making program". Macromedia Flash is one of the popular programs in making animation, both for Web, presentation, game, or other purposes. There are several advantages of Macromedia Flash 8.0 according to [14]: (a) Can create interactive buttons with a movie or other object; (b) can make changes in color transparency in a movie, (c) can make changes in animation from one form to another; (d) can make animated movements by following the predetermined flow. (e) can be converted and published (Publish) into several types, including .swf, .html, .gif, .jpg, .png, .exe, .mov. (f) can process and create animations from Bitmap objects. Flash vector-assisted animation programs have flexibility in making vectors. Pretest is also called the initial ability test given to both classes at the beginning of the study carried out to find out the learning outcomes in the cognitive (Knowledge).

Based on the research data obtained the average value of pretest of students in the control class was 34.6 and in the experimental class before being given treatment, the average score of the students' pretest was 34. The average score of the pre-test results of students before being treated with the conventional model in the control class is 34.6 and the standard deviation is 8.40. While the average value of students before being treated with the Cooperative Integrated Reading and Composition model is 34.2 and the standard deviation is 9.31. Thus, it can be concluded that the results of learning Indonesian students are still low before receiving treatment. After doing the pretest, it was known that students in the control class who received a score of 25 as many as 5 people, a value of 30 as many as 8 people, a score of 35 as many as 5 people, a value of 40 as many as 1 person, a value of 45 as many as 3 people, a value of 50
as many as 3 people. Whereas in the experimental class that got a score of 25 as many as 8 people, a value of 30 as many as 7 people, a value of 35 as many as 1 person, a value of 40 as many as 2 people, a value of 45 as many as 4 people and a value of 50 as many as 3 people.

After obtaining the pretest data of students from the control and experimental classes, the next step is to test data analysis using a prerequisite test where the data requirements must be normally and homogeneously distributed. Before testing the hypothesis first the data prerequisite test is carried out, namely the normality test. Normality Test is done to find out whether the data taken from the population is normally distributed or not. In this study, researchers used the Lilliefors test. Normality Test Results obtained in the control class Count = 0.161 and Table = 0.173 so it was concluded Count < Table = 0.161 < 0.173 results of a pretest data control class proved that are normally distributed. While in experimental class Count = 0.154 and Table = 0.173 so it was concluded Count < Table = 0.154 < 0.173 results of a pretest data experimental class proved that are normally distributed.

Homogeneity testing is done to find out whether the sample class comes from a homogeneous population or not, meaning that the sample used in this study can represent the entire population. Test results Homogeneity of data obtained values Count = 1.228 and Table = 1.983 so it was concluded Count < Table = 1.228 < 1.983 it means the sample used in this study is declared homogeneous or can represent the entire population. The t test (different test) pretest data was used to determine the similarity of students’ initial abilities in the two sample groups. The results of different students’ initial ability tests obtained that for the pretest Value Count < Table = 0.16 < 2.01 then Ho is accepted so it can be concluded that the initial ability of students in the control class is the same as the initial ability of students in the experimental class. After obtaining that the pretest data from both classes is normal, homogeneous and there is no specific difference, then in the case of this study the two sample classes were given different treatments. The difference in question is that the experimental class will be treated by applying the Cooperative Integrated Reading and Composition learning model assisted by flash media while in the control class the NHT (Number Head Together) learning model is treated.

After the two classes were given different treatments, all students in the two classes were then given a posttest with the same questions as the pretest. The results obtained showed that the mean value in the control class was 73 and the standard deviation was 9.24. While the average value of the experimental class students is 80.6 and the standard deviation is 10.3. Thus, it can be concluded that the results of learning Indonesian language students are higher after receiving treatment. then the posttest result is known that students in the control class who get 60 scores of 4 people, a score of 65 as many as 5 people, a score of 70 as much as 2 people, a value of 75 as many as 6 people, a value of 80 as many as 3 people, a value of 85 as many as 4 people and a value of 90 as many as 1 person. Whereas in the experimental class that got a score of 60 as many as 3 people, a score of 65 as many as 5 people, a value of 75 as many as 3 people, a value of 80 as many as 4 people, a value of 85 as many as 8 people, a value of 90 as many as 5 people and a value of 95 as many as 1 person. So, the picture above shows that in the Experiment class, the grades obtained by students are better and higher than in the control class. This shows that the application of Indonesian language learning by using Cooperative Integrated Reading and Composition learning models assisted by flash media is good to be applied in learning activities.

Before testing the hypothesis on the posttest data, the data pre-requisite test is normality using the Lilliefors test. The results of the normality test obtained in the control class Count = 0.167 and Table = 0.173 so it can be concluded that Count < Table = 0.167 < 0.173 the data prove that the results of the control class postest are normally distributed. While in
experimental class. \( \text{count} = 0.150 \) and \( \text{table} = 0.173 \) so it can be concluded that \( \text{count} < \text{table} = 0.150 < 0.173 \). The data prove that the results of the experimental class posttest are normally distributed. Homogeneity testing is done to find out whether the sample class comes from a homogeneous population or not, in the sense that the sample used in this study can represent the entire population. The results of the data homogeneity test obtained in the control class value \( \text{Fcount} = 1.178 \) and \( \text{Ftable} = 1.983 \) so it can be concluded that \( \text{Fcount} < \text{Ftable} = 1.178 < 1.983 \) which means that the sample used in this study is declared homogeneous or can represent the entire population.

Hypothesis testing in this study is there is a significant and positive influence on the use of Cooperative Integrated Reading and Composition learning models assisted by flash media on student learning outcomes in Indonesian language lessons more effectively when compared to Number Head Together learning models. To test the hypothesis, the step taken is to analyze the results of the t-test. The hypothesis criteria will be accepted if \( t_{\text{count}} \) is greater than \( t_{\text{table}} \) at a significance level of 5%, and the significance is less than 0.05, it can be concluded that the hypothesis in this study is accepted. The results of testing hypotheses obtained the value of Posttest \( t_{\text{count}} > t_{\text{table}} \) is 3.317 > 2.012 so \( Ho \) is rejected and \( Ha \) is accepted, so it can be concluded that there is a significant influence by using Cooperative Integrated reading and Composition learning model assisted by flash media on the learning outcomes of Indonesian students of Grade V State Primary School 101776 Sampali sub-district Percut Sei Tuan.

4 Conclusion

Based on the data obtained from the research and data processing, the following conclusions can be drawn:

a) The average value of student learning outcomes in the control class given the learning model Number Head Together Indonesian Language Class V-A Public Primary School 101776 Sampali District Percut Sei Tuan 2017/2018 is 73.

b) The average value of student learning outcomes in the experimental class which was treated using the Cooperative Integrated Reading and Composition Learning Model assisted by flash media on the learning outcomes of Indonesian in class V-B Public Primary School 101776 Sampali Subdistrict Percut Sei Tuan 2017/2018 is 80.6.

c) Based on the results of the calculation of the t-test with the provisions of the posttest value, \( t_{\text{count}} > t_{\text{table}} \), the results obtained from the acquisition of posttest scores are \( t_{\text{count}} = 3.317 \) while \( t_{\text{table}} = 2.012 \). With this \( 3.317 > 2.012 \), \( Ho \) is rejected and \( Ha \) is accepted, that there is an influence of the use of Cooperative Integrated Reading and Composition Learning Model assisted by flash media on the learning outcomes of Indonesian Language for students in grade V Public Primary School 101776 Sampali, Percut Sei Tuan 2017/2018.

SUGGESTION

Based on the results and conclusions above, the researcher presents several suggestions including:

1) For Indonesian Language subject teachers (Class Teachers) it is better to use learning models such as Cooperative Integrated Reading and Composition (CIRC) assisted by
flash media, because by using this learning model in Indonesian language learning students tend to be more eager and active to learn delivered and that will affect the learning outcomes.

(2) The importance of learning various types of learning models that are suitable for teachers to use in the learning process, and the development of technology-based media for that also requires further research for other researchers as concrete steps to improve student learning outcomes and even increase students' enthusiasm and enthusiasm. in learning both for all subjects.

(3) The education manager is advised to provide a wide opportunity for teachers to make changes in learning activities through official programs in an effort to increase students' enthusiasm and participation in learning.

(4) Given the limitations of researchers, the researchers suggest that other researchers who want to research in the same form of research are advised to conduct research on different locations and materials so that it can be used as a comparative study of teachers in improving the quality of education, especially in Indonesian subjects.

References

Innovation Of Teaching Media Through E-Book for Study Middle and Estern Indonesian Food Processing

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Abstract. This study aims to assist teaching staff in developing learning media, especially learning innovations in improving e-book teaching materials for Middle and Estern Indonesian Food Processing as learning media for students and to improve students' knowledge and competence in processing and serving Indonesian food seen from the results of student culinary testing. In Middle and Estern Indonesian Food Processing courses. This study uses the Research and Development (R & D) method. Learning media produced in the form of e-book media. Data obtained through questionnaire techniques, assessment sheets from media experts and material experts. The subjects of this study were the third semester students of Tata Boga Unimed which amounted to 30 undergraduate students. Based on the results of data analysis and discussion, it can be concluded that e-book learning media can help teaching staff and students in developing learning media, especially the development of students' knowledge. The use of e-book media has a positive effect on student knowledge, with the average value of the experimental class higher, namely 43 and the control class with an average of 39.14.

Keywords: e-book, middle indonesian food, estern indonesian food, food processing, teaching media

1 Introduction

Education is a complex process along with human development. Through education various aspects of life are developed through the process of learning and learning. Various problems in the learning process need to be harmonized and so that learning conditions are created in accordance with the objectives to be achieved and can be obtained as optimally as possible. To complete the learning and learning component in school, the task of a teacher should be to use media or tools that are able to stimulate learning effectively and efficiently.

The presence of media means quite important. The obscurity of the material delivered can be helped by presenting media as an intermediary. The complexity of the material to be delivered to students can be simplified with the help of the media. Information technology and computers today have developed so rapidly. In the field of education, the presence of computers provides its own color by using it in learning activities and proven to have many advantages. Especially in learning, the ability of computers that are able to integrate many media, is very helpful to understand the material and make students happy in learning. This requires the teacher to always develop the skills to create learning media, so that the material delivered to students can be easily accepted, interesting, motivate students and in accordance
The above problems are generally faced by many with the desired goals. To help students overcome difficulties in mastering the material.

The above problems are generally faced by many technological and vocational education institutions because technology as an object being studied is a dynamic (always developing) field and some have global coverage. The Unimed Culinary Education Program also faces disparity issues as above. Some of the courses taught are included in the technology field and have a global scope, including Indonesian Middle Eastern Food Processing. In this course students are required to be able to process and serve Indonesian food consisting of staple foods, side dishes, vegetables, special drinks and delicious tasting. (Syllabus for Middle Eastern Indonesian Food Processing Courses). The aim of this course is that students after following it can understand the Eastern and Central Indonesian culinary, skilled in processing and serving Indonesian dishes. The curriculum of this course is arranged in 3 practice credits, where all the subjects given in the form of face-to-face for one semester are practical activities. Yet to fulfill the demands of the course in understanding Indonesian Middle Eastern food culinary is not enough to be obtained only through practical activities. Concretely this gap problem arises when several graduates are accepted to work in the restaurant industry or hotels that serve Middle Eastern Indonesian cuisine. As according to the acknowledgment of some alumni who currently work in international standard restaurants and hotels, it turns out that their academic abilities and skills are still not enough to carry out the job description. There are still many new things, especially concerning some techniques, recipes, and culinary that they have not yet obtained in college so that they still have to enrich their knowledge by digging from sources outside of academics, for example by taking courses, reading books and articles in the mass media, as well as the use of the internet.

From this it appears that even though graduates have been equipped with the knowledge and skills of the campus, in the end they are still required to study independently after entering the workforce. Regarding the excavation of knowledge outside of academics, it can actually be done since graduates still attend lectures. There are several things that cause this to not be done by students. First, lack of motivation and awareness from educators, so students do not see the importance of extracting knowledge and information outside of academics. Second, both educators and students are less able to see the benefits or effects of learning outside of academics for enrichment of lecture material. Excavation of knowledge outside of academics can be done by using the internet. The widespread use of the internet for educational purposes, especially in developed countries, is a fact that shows that with this media it is possible to hold a more effective learning process. This happens because with the characteristics and characteristics of the internet that are quite typical, it is hoped that it can be used as a source of learning as other sources have been used previously such as radio, television, interactive CD-ROM and others. The results of student lab work are determined by the value of preparation, process, and final results. In the final result the value is determined by the taste of the food, the accuracy of the recipe and presentation which consists of elements of appearance, addition of garnish, accuracy of portions, and accuracy of serving utensils. But all this time in practicum in the Middle Eastern Indonesian Food Processing course, the presentation of the results of student practices tended to be as they were and waited for examples from the lecturers. This shows that students' insights and creativity in terms of variations in presentation are still lacking. The internet can used by students in learning Middle Eastern Indonesian Food Processing courses to add insight and stimulate the emergence of ideas in the presentation of practical results. Images of cuisine in a culinary site can be adopted by students to enhance creativity in presenting the results of their practice. So that when students often see and utilize the media, the wider the insight and acquisition of ideas in the presentation that can be applied
in practicum. This is supported by the results of a study conducted by [6] that the application of internet-based peer tutoring learning models proved effective in increasing student learning activities. Based on the description above, it can be said that in an effort to improve the quality of learning to improve student achievement, it is necessary to explore knowledge and insights outside the campus. For this reason, it is necessary to conduct research that will provide answers to whether learning outside of academics has an influence on enrichment of lecture material. The learning methods outside the academic that will be examined here are internet learning resources in the form of e-books.

In this case, it is obligatory for students to access electronic learning resources. Even though it is optional, students who use it will certainly have additional knowledge or insight, complementary (complement) that is if the source of electronic learning is programmed to complement the learning resources that students receive in the classroom [1]. As a complement means the source of electronic learning is programmed to be a source of reinforcement (enrichment) or remedial for students following conventional learning activities, and substitution (substitute) of this function in developed countries has been applied to several universities, where learning methods with internet learning resources for example among them in the form of e-books to be one alternative substitute for lecture activity models to students with the aim that students can flexibly manage their lecture activities in accordance with the time and other activities of everyday students.

2 Methodology

2.1 Types Of Research

This research uses research and development methods. Research and development (R & D) can be defined as research methods that are intentional, systematic, aim/directed to find, formulate, improve, develop, produce, test the effectiveness of products, models, methods / strategies / methods, services, procedures that are superior, new, effective, efficient, productive, and meaningful [2]. In order to produce e-book media products as learning media that are able to help students at the stage of development of knowledge in the field of expertise, the development model that will be used in this study is the model of education research and development (Educational Research & Development). According to Borg & Gall [3] that research and development consists of 10 stages, but in [6] the procedure of development research according to Borg & Gall can be done more simply, which is only doing 5 main steps, namely: (1) Analyze the product to be developed, (2) Develop the initial product, (3) Validate and revise, (4) Small-scale field trials and product revisions, (5) Large-scale field trials and final products.

2.2 Trial Design

Product testing is a development stage carried out in two stages, namely trial 1 (limited trial) and trial 2 (field trial). Limited trials using the design of one shot Case Study because the assessment only uses the final value of learning outcomes (posttest) without using a pretest[4]. The field trial used a quasi-experimental method with a pretest and posttest control group design. Class A control class and class B experimental class.
2.3 Method of collecting data

The data obtained from this study is primary data. This data is data relating to validation and responses from media and material experts, and lecturers about e-book learning media developed by researchers. In addition, the implementation data from e-book media in the learning process and e-book effectiveness data in increasing knowledge after participating in learning activities.

Data collection techniques in this development research are hypothetical models of e-book learning media and observation guidelines. The hypothetical model is a model design that will be tested for its feasibility in the field. While the observation guideline is a tool used for reference observations. The observation guide in this study uses a rating scale. Observation can be done in a participatory or non-participatory manner [6]. In this study, researchers used nonparticipatory observation where researchers did not participate in activities, researchers only had the role of observing activities that took place in the field, not participating in activities.

2.4 Data analysis technique

To find out the quality of learning media that has been developed both from the material aspect and from the aspect of the media, the data that is still in the form of scores are converted into qualitative data (data intervals) with a scale of five.

The data obtained were analyzed using qualitative descriptive statistics. This analysis is intended to describe the characteristics of the data in each variable. With this, it is expected to facilitate the understanding of data for the subsequent analysis process. The results of data analysis are used as a basis for revising the developed media products. Test the hypothesis using SPSS (Statistical Package for Social Scores) 16.0 for Windows, a statistical test package for social science. The t-test is used to determine the significance of the influence of the independent variable, e-book (X) learning media on the Central and Eastern Indonesian Food Processing Courses (Y) so that it can be known whether existing allegations can be accepted or rejected.

3 Result and Discussion

3.1 Preliminary Research

Needs analysis is carried out by conducting interviews with Lecturer Lecturers, the results of interviews related to learning media that have been carried out and desired by educators, show that the relevant lecturers often have difficulty in delivering material, especially in delivering and introducing material. Difficulties experienced are related to the response of students who are less motivated in listening to the material given by lecturers, because of the lack of specific learning media in prescribing and manuals. For this reason, learning is often done by teachers by lecturing, and analyzing recipes according to the topic of discussion at that time. After conducting a field analysis at the research site about the needs of lecturers while teaching, researchers can draw a conclusion that in the learning process the lecturers have difficulties, due to lack of media and guidebooks, especially material about processing central and eastern Indonesian food. As a result of limited learning media used, especially in
terms of reference books so students only imagine what is explained by the lecturer, and students tend to be bored, sleepy and crowded with their friends.

3.2 Preparation of Product Prototypes

After reviewing the results of the educator's needs analysis, the next step is to develop a prototype product for learning media development. The procedure for developing the big book learning media is as follows: determining the material adapted to the learning event unit (SAP) or semester learning plan (RPS), implementing the development, compiling an e-book learning media for the formation of teaching materials, review and trial of products consists of reviews of media experts and material, revisions, and small and large scale trials, and the final stage is the final e-book learning media for teaching materials.

3.3 Trial Results of Development Results

In validating a learning media product that was developed, material experts used were lecturers Dra. Siti Wahidah, M.Sc. The material expert test was carried out through discussions, questionnaires, interviews with the following results, the material expert consisted of 1 lecturer namely Indonesian Food Processing Lecturer. The data collected through questionnaires shows that, from the aspect of material content that the material is in accordance with the determined material indicators, while for the language aspect that the language used still needs improvement, which is adjusted to the enhanced spelling language (EYD), so that teaching can be accepted easily. Overall, the assessment of material and language aspects reached 122 with the final average of 4.06 which if converted from quantitative to qualitative is included in the good category. In addition to the questionnaire, interviews were also conducted on e-book learning media products, both about the truth of the concept, the depth of the discussion, and the responses and general comments in the framework of improvement or revision before going to the next stage. The results of interviews with material experts that, e-book learning media products need to be added, because if the product is made only one type, the results obtained are less than optimal, and students will quickly get bored if the product used is only one type. In the sub-section of material, there are still non-standard sentences, there are still very long sentences, so it needs to be simplified again. Then in the recipe indicator, there are still some non-standard recipes, so it needs to be replaced with another that matches the latest level of prescription development and daily practice in the laboratory. Conclusion of results from material experts, e-book learning media products are feasible to be tested with revisions. The results are reviewed by researchers, as a basis for product improvement, especially in terms of product appearance and product presentation.

Media expert validation was carried out by PKK lecturers who were also lecturers of the Postgraduate Program namely, Dr. Dina Ampera, M.Sc. Learning media expert evaluation is intended to obtain input about the quality of media display, and aspects of learning. The results of the evaluation of learning media experts are in the form of an assessment score on several aspects that cover the display aspects, and aspects of learning. Assessments carried out by media experts get a score of 146 if averaged get a result of 4.05 and if converted from quantitative to qualitative are included in the good category. In addition to conducting assessments through questionnaires, media experts also provide input on e-book learning media products, namely from the color aspects contained in the media, the combination of colors contained in e-books using contrasting and bright colors to attract students' attention, the use of media products The e-book is further clarified by the steps to use.
Then in the discussion of the material, it is better if you use the recipe, the recipe used is the standard recipe. While the fonts and letters of writing in the text are more enlarged, using fonts 12-14 in order to facilitate students in understanding the material, the format of writing to be re-trimmed and supported by decoration on each page, then the flow in the chapter is made more systematic. After giving advice on e-book learning media development products, the final stage of the media expert concluded that e-book learning media is feasible to be tested with revisions [5]. The results of reviews from media experts were reviewed by researchers, as a basis for product revisions, especially from the aspect of appearance.

Learning media that have been validated by material experts and media experts and have been revised based on records from these experts, then tested on a limited field. Limited field trials using a sample of students in the class group of 6 students. The use of e-book media itself, is used every time in the small class research process [6]. The researcher explained about the use of e-book media to educators, whereas the use of the media students was also involved so that students could understand each chapter of the material provided, besides the purpose of the use of the media, inviting them to get to know the recipes in the media. The results obtained can be seen that, each indicator on the value of the material has a moderate value, only on the indicator in analyzing the recipe has a high value. Overall, the use of e-book media in the preparation of materials reached 3.36 in the high category. The results of this small group trial were reviewed by researchers, as a basis for product revisions for large group trials. In this small group trial, discussions and observations were also carried out, according to the lecturer, the e-books used had a high level, students preferred to access rather than buy or look for reference books.

Extensive trials of e-book learning media were carried out after limited trials. There are two classes that are used in the KB A class and KB class. Before using the learning media e-books the researchers do the pretest first, namely by making observations before applying e-book learning media. The observations were carried out on the two classes selected, namely class A as the control class and class as the experimental class. In the assessment using these two classes, the researcher asked for help from one of the class A lecturers as observers. The results obtained at the pretest of the control class were 31.64 in the "good" category. Whereas in the experimental class the average value was 32.28 in the category of "good". After evaluating the pretest in the control and experimental classes, the researcher conducted a posttest in the control class and the experimental class. This assessment was carried out after using e-book learning media for the experimental class and in the control class the storytelling lecturer used a guidebook prepared by the researcher.

The results obtained by researchers in the posttest of the control class were 39.14 with the category "very good", and the experimental class 43 with the category "very good". In addition to assessing the results of the media use test post, also evaluating the results of different test achievement of each character value given, the results of different tests obtained on the material values based on the calculation of independent sample t-test on the student achievement standards can be seen that $F = 0.200$ with the significance level of 0.670 is greater than 0.050. This shows that the actual standard gain variance of student character achievement between the control and experimental classes is the same, namely -2,777. In this test the two variances are used (equal varians assumed). The standard t-gain test for the same variance is -2.777 with a significant level of 0.032. Because the value of a significant level is smaller than 0.05 then $H_0$ is rejected. Based on this, it can be concluded that there are significant differences in the achievement of the preparation of student teaching materials between classes using conventional learning media with learning media as a result of development. Different test results for character discipline values, based on calculation results.
independent sample t-test on the gain standard of student character achievement can be seen that the value of $F = 0.725$ with a significance level of 0.419 greater than 0.05. This shows that the actual standard gain variance of student character achievement between the control class and the experimental class is the same, namely -4.575.

In this test the two variances are used (equal variances assumed). t standard gain shows that it has the same variance of -4.575 with a significance level of 0.002. Because the significance level is smaller than 0.05, $H_0$ is rejected. Based on this, it can be concluded that there are significant differences in the achievement of the preparation of teaching materials between classes using conventional learning media and learning media as a result of development. And the results of different tests for material values based on the results of the calculation of the independent sample t-test on the gain standard achievement of student characters can be seen that the value of $F = 0.157$ with a significance level of 0.712 greater than 0.05. This shows that the actual standard gain variance achievement of student knowledge between the control class and the experiment is the same, namely -0.868. In this test the two variances are used (equal variances assumed).

The calculation results show that the standard t gain for the same variance is -0.868 with a significance level of 0.434. Because the significance value is greater than 0.05 then $H_1$ is rejected. Based on these results it can be concluded that there is no significant difference in the achievement of the preparation of teaching materials using conventional learning media with classes that use learning media as a result of development. After calculating the knowledge and inland materials it can be concluded that e-book learning media has a significant influence on the preparation of Central and Eastern Indonesian Food Processing teaching materials for students. This happens because in the learning process students are involved directly in applying in the culinary and laboratory fields when practicing to see the results of competencies at the end of learning. After testing e-book learning media products, researchers gave questionnaires to educators. The assessment conducted by lecturers after using e-book media got very high results, namely 8.57. This, included in the category of proper use in the learning process, especially in learning to increase student knowledge.

4 Conclusion

The development of e-book learning media is carried out through five stages, namely: needs analysis, initial product development, expert validation and revision, small-scale field trials and revisions, and large-scale field trials and final products. In the assessment process carried out by experts, the material experts produced a mean score of 4.06 with good categories, and media experts by obtaining a mean score of 4.05 in the good category. With the conclusion that e-book learning media is feasible to be tested with revisions as recommended. There were differences in scores between the control and experimental classes, the experimental class obtained a mean score of 43 with a very good category, and the average score for the control class was 39.14 with a very good category. From the average acquisition obtained, the experimental class obtained better results than the control class. With this acquisition, it can be concluded that e-book learning media has a significant influence on students as an innovation in developing Central and Eastern Indonesian Food Processing teaching materials for student.
Suggestion

For Educators The results of this development can be used as an alternative learning media in the introduction of Central and Eastern Indonesian Food Processing material to students. This product can stimulate the spirit of students to get involved in learning, especially when lecturers explain. For Future Researchers It is hoped that future researchers can conduct research on training with educators in the development of learning media that use interactive media.

References

Development of a Geography Booklet as Learning Media Based on Subject Literature

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Abstract. This research aims to determine the feasibility of a geography booklet as learning media based on subject literature and to find out the effectiveness of a geography booklet as learning media based on subject literature towards students learning outcomes. Stages of this research are stage of needs analysis, stage of planning geography booklet as learning media (design), stage of development (develop), and stage of trials (validation). Research results indicate (1) expert trial of geography topics is in very good qualification (90.45%), (2) expert trial of learning media is in very good qualification (84.96%), (3) expert trial of learning design is in very good qualification (94%), (4) individual trial is in very good qualification (94.81%), (5) small group trial is in very good qualification (96.06%), (6) field trial is in very good qualification (99.52%). The hypothesis trials resulted proved that there are significant differences of learning outcomes in between students who did not use a geography booklet as learning media based on subject literature with students who use a geography booklet as learning media based on subject literature. This is indicated by the results of data processing tcourt = 15,78, at the level of significance α = 0.05 ttable = 1,69. The conclusion is a geography booklet as learning media based on subject literature that has been develop, feasible and effective to convey a better change by looking at geography learning outcomes at the high school level.

Keywords: Learning outcomes, learning media, booklet.

1 Introduction

Geography subject in education is to be able to develop students’s understanding about spatial organization, society, places, and environments on Earth surface [1]. Through geography subject, students are encouraged to be able to understand the physical processes that form the patterns of the Earth, the characteristics and distribution of ecology spatial on earth, so that students are expected to understand that humans created regions to simplify the complexity of the Earth. [2] states that geography is a valuable subject in the school curriculum. Because Geography can contribute us in understanding the world (or parts of the world). [5] geography is the study of equations and differentiations of geosphere phenomena with environmental, territorial, in spatial contexts.

According to [3] explains "the media is a tool of communication channel. Media comes from the Latin language and it is a plural form of the word medium which literally means an intermediary, which means the intermediary of the message source (a source) with the recipient of the message (a receiver), so the learning media plays an important role for the teacher to convey learning material to students." [4] “A medium (plural, media) is a means of communication and source of information. Derived from the Latin word meaning “between” the term refers to anything that carries information between a source and a receiver." [4] states that learning media is one of the communication tools in the learning process. The learning process contains five components of communication, namely the teacher (communicator), learning materials, learning media, students (communicants) and learning objectives.

According to the Ministry of Education and Culture (2016: 2) Literacy is the ability to access, understand, and use something intelligently through a variety of activities, including reading, viewing, listening, writing, and speaking. [3] said "reading is an extremely complex and multifaceted process". The reader is actively involved in various processes that occur simultaneously. First, the reader encodes both perceptual and conceptual. According to Rod Welford the Australian minister of education and culture, literacy is the core or
heart of the students' ability to learn and succeed in school and afterwards, so even though the background of students is different, government must strive for them to get an adequate level of literacy to face challenges.

The limitations of learning media on the one hand and the ability weakness of teachers to create media, lecture methods are still used. The limitations of learning media must be overcome by passing on the innovation of the development of learning media based on the area or domain of learning technology, one of them with the technology of print media or visual media [5].

By looking the characteristics of geography subject in such a way that a geography booklet as learning media based on subject literature is very suitable to use in geography learning process for learning able to get the information they want. Through this geography booklet as learning media based on subject literature that designed for dynamics of lithosphere and its effects on life, so that it can be more easily understand the topics being taught.

Based on the results of observations and interviews with subject teacher, it was explained that the difficulties experienced in geography learning lay in the lack of learning media, such as pictures, videos, teaching props and IT. Teachers generally still use learning media in the form of textbooks and students' worksheets as learning resources.

Booklet is one innovation form of learning media in the form of print media. This media contains the topics in physical form that is unique, interesting, and flexible. Unique because of small physical form complete with a full color design that will foster an interest to use it. Flexible because the shape is small (smaller than the book in general), so it can be carried and used anywhere and at any time [6]. This booklet media provides new nuances in reading literacy and more comprehend the topics in geography. Booklets are designed by highlighting clearer images and completed with descriptions which are the essence of the topics contained in the textbooks used by students, then able to motivate them so students able to think HOTS by using booklet media, students' literacy skills for reading also increase so that Geography lessons are easy to understand. Booklet media is a blend of pictures media and printed textbook media that contain information or topics about something to facilitate the delivery of information or delivery in learning "Booklet is a small book (half of quarto paper) and also thin, no more than 30 sheets back and forth which contain writing and pictures. The term booklet comes from books and leaflets, which means the booklet media is a combination of leaflets and books in small format (size) such as leaflets. The structure of the contents of the booklet resembles a book (preliminary, contents, closing), the way of the presentation of the contents is much shorter than the book".

2 Methodology

The development of a geography booklet as learning media based on subject literature been held in Panca Budi Private High School Medan. The method used was the approach of research and development from. The process implemented through stages: preliminary, development, and testing. Instruments used in the preliminary stage are the literature studies and field surveys; the media development stage was carried out in the form of the initial drafting of the media, limited trials, small group trials and field trials, also the trials of effectiveness of the development of a geography booklet as learning media based on subject literature by comparing the students learning outcomes before and after using the learning media.

2 Result and Discussion

The research results by the topics experts, media experts and learning design experts in each aspect of overall assessment were determine by the average grade in each category. The results of the assessment subsequently analyzed to determine whether the geography booklet as learning media based on subject literature feasible or not feasible to be developed. The average percentage of the research results by topics experts, media experts and learning design experts, shows in the table below:
Table 1. Results Percentage of average of topics experts, media experts and learning design experts

<table>
<thead>
<tr>
<th>No.</th>
<th>Categorization</th>
<th>Percentage</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Topics Experts</td>
<td>90.45%</td>
<td>Very Good</td>
</tr>
<tr>
<td>2</td>
<td>Media Experts</td>
<td>84.96%</td>
<td>Very Good</td>
</tr>
<tr>
<td>3</td>
<td>Design Experts</td>
<td>94%</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

To find out whether this geography booklet as learning media based on subject literature is effective in increasing geography learning outcomes, so media trials are conducted by comparing grades before using learning media (pre-test) and after using learning media (post-test).

3.1 Data on Preliminary Test Results/ Before Using Media

The trials of the effectiveness of geography booklet as learning media based on subject literature held at Panca Budi Private High School Medan where data was obtained with range grade was 3, the lowest grade was 16 with the highest grade of 35. The mean grade was 25.68, the mode grade was 26 and median 26. Preliminary test data carried out before using the geography booklet as learning media based on subject literature can be seen in the following table

Table 2. Frequency Distribution Before Using Learning Media

<table>
<thead>
<tr>
<th>Interval Class</th>
<th>Absolute frequency</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 - 19</td>
<td>4</td>
<td>12.5</td>
</tr>
<tr>
<td>20 - 23</td>
<td>7</td>
<td>21.87</td>
</tr>
<tr>
<td>24 - 27</td>
<td>10</td>
<td>31.26</td>
</tr>
<tr>
<td>28 - 31</td>
<td>7</td>
<td>21.87</td>
</tr>
<tr>
<td>32 - 35</td>
<td>4</td>
<td>12.5</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>100</td>
</tr>
</tbody>
</table>

The histogram of students’ grade who learn before using geography booklet as learning media based on subject literature, shows in the following chart:

Fig.1. The histogram of students’ grade before using geography booklet as learning media based on subject literature

3.2 Data on Final Test Results/ After Using Media

The effectiveness trials after using geography booklet as learning media based on subject literature was conducted at Panca Budi Private High School Medan where data was obtained the range of grade was 3, the lowest grade was 38 with the highest grade of 57. The mean grade was 49.53, the mode grade was 47.12 and median of 47.66. The final test data conducted after using geography booklet as learning media based on subject literature, as shows in the following table:

Table 3. Frequency Distribution After Using Learning Media

<table>
<thead>
<tr>
<th>Interval Class</th>
<th>Absolute frequency</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>38 - 41</td>
<td>3</td>
<td>9.37</td>
</tr>
<tr>
<td>42 - 45</td>
<td>5</td>
<td>15.63</td>
</tr>
<tr>
<td>46 - 49</td>
<td>11</td>
<td>34.37</td>
</tr>
<tr>
<td>50 - 53</td>
<td>6</td>
<td>18.75</td>
</tr>
</tbody>
</table>
### Data on Students Literacy Results on Learning Media

To find out the results of students' literacy, a questionnaire was used to find out the students' literacy results before using the learning media compared to after using geography booklet as learning media based on subject literature. Which is the mean grade of literacy results before using learning media is 43%, and the mean grade of literacy results after using learning media is 94%. The students' literacy results program shows in the following chart:

**Fig. 2.** The histogram of students' grade after using geography booklet as learning media based on subject literature.

### 3.3 Data on Students Literacy Results on Learning Media

<table>
<thead>
<tr>
<th>Interval Class</th>
<th>Absolute Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>54 – 57</td>
<td>7</td>
<td>21.88</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>100</td>
</tr>
</tbody>
</table>

The histogram of students' grade who learn after using geography booklet as learning media based on subject literature, shows in the following chart:

**Fig. 3.** The histogram of students' literacy results before and after using geography booklet as learning media based on subject literature.
Development of geography booklet as learning media based on subject literature designed by using the Adobe design application. Things that have been developed in geography booklet as learning media based on subject literature consisting of topics that will be taught and the media is packed with full color design, and explanations are accompanied by images that are easy to understand that consists of 4 meetings for each.

From the research results conducted using the geography booklet as learning media based on subject literature, there are differences in geography learning outcomes between students who are taught using the media and students who are taught without using the media that is obtained from the results calculation $t_{\text{count}} = 15.78 > t_{\text{table}} = 1.69$, therefore it can be concluded that $t_{\text{count}} > t_{\text{table}}$ which means "the geography booklet as learning media based on subject literature that have been developed able to increase the motivation of geography learning outcomes in high school".

4 Conclusion

The development of geography booklet as learning media based on subject literature scored very well, which means there was changes in learning motivation with the mean grade reach the passing grade for each lecturer of topics experts, media experts and learning design experts, where the media is suitable to use for learning. The results of the effectiveness trials conducted to obtain the learning outcomes proved that the learning outcomes of students who use the geography booklet as learning media based on subject literature are better than students who do not use the geography booklet as learning media based on subject literature. From the results of the media trials, it shows that there are significant changes from the learning outcomes and literacy become a basis to use booklet as geography learning media.

References

The Effect of Admixture Type F and Silica Fume on High Early Strength Self Compacting Concrete

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Abstract. High Early Strength Self Compacting Concrete (HESSCC) is a new invention in the world of concrete technology that have workability, durability and high initial strength advantages, so it can be applied well in the pre-cast concrete world. In this research, superplasticizer used is Viscocrete 8045 and Silica Fume filler. The purpose of this research is to know the effect of Viscocrete 8045 and Silica Fume on the mechanical properties of concrete. The samples used are cylinders with 15 cm diameter and 30 cm height with a total of 48 samples using Silica Fume variation of 5%, 10%, and 15% and addition of Viscocrete 8045 as much as 1.5%. From the test result, it is obtained that the value of concrete compressive strength increased due to the addition of the material. Compared with normal concrete, the initial compressive strength of concrete is increased with maximum value on the 15% Silica Fume variation of 13.362% while the final compressive strength of the concrete is increased with the maximum value on the 15% Silica Fume variation of 30.266%. The addition of the material has no impact on the value of tensile strength of concrete. However, at the absorption value, the addition of Silica Fume causes a decrease in the absorption value of concrete.

Keywords: Concrete, Silica Fume, early compressive strength.

1 Introduction

In developed countries such as Japan, Self Compacting Concrete (SCC) has been applied well and has increased rapid usage especially in the world of concrete industry [1]. The Indonesian pre-cast concrete industry itself requires a concrete variant with large initial strength characteristics to optimize time and production capacity. The current SCC has not been able to facilitate it well because it does not have a large initial strength characteristic so that SCC has not been able to applied properly [1]. The development of the latest concrete admixture research is capable of producing a type of admixture which capable of producing concrete variants with high fluidity levels and a rapid initial strength enhancement called High Early Strength Self Compacting Concrete (HESSCC) [1]. SCC is a concrete that has a high fluidity so that it can flow and fill the spaces in the mold without the compaction process or requires very little vibration to compress [2].
2 Methodology

Silica fume is a fine pozzolan material, in which more silica compositions are produced from blast furnace or silicone residue or silicon iron alloys (known as a combination of microsilics with silica fume) [3]. The use of silica fume in a concrete mix is intended to produce high strength concrete. High strength concrete is used, for example, for structural columns or shear walls, pre-cast or pre-strained concrete and other purposes [4]. The current high performance concrete strength criteria is about 50-70 MPa for 28 days. The use of silica fume ranges from 0-30% to improve the strength and durability characteristics of the concrete.

<table>
<thead>
<tr>
<th>Table 1. Silica Fume Physical Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Properties</td>
</tr>
<tr>
<td>Specific Gravity</td>
</tr>
<tr>
<td>Average particle size (µm)</td>
</tr>
<tr>
<td>Passes sieve No.25 (%)</td>
</tr>
<tr>
<td>Acidity (pH)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2. Silica Fume Chemical Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition</td>
</tr>
<tr>
<td>SiO$_2$</td>
</tr>
<tr>
<td>Carbon</td>
</tr>
<tr>
<td>Fe$_2$O$_3$</td>
</tr>
<tr>
<td>CaO</td>
</tr>
<tr>
<td>Al$_2$O$_3$</td>
</tr>
<tr>
<td>MgO</td>
</tr>
<tr>
<td>MnO</td>
</tr>
<tr>
<td>K$_2$O</td>
</tr>
<tr>
<td>Na$_2$O</td>
</tr>
</tbody>
</table>


The surface of the cement particles has a function that makes it clot when mixed with water. This clump causes a certain amount of water to be trapped and causes insufficient water volume to hydrate with the cement thereby reducing the consistency of cement paste. Increasing the amount of water can increase consistency but will decrease the strength as the number of pores increases. High Range Water Reducer or superplasticizer is used to solve the problem. Superplasticizer acts as a surface active agent. Superplasticizer used is Viscocrete 8045. The use of Viscocrete dose in the study is 1% to 2% of the amount of cement [5].

2.1 SCC Test

In order to meet SCC requirements, it is necessary to perform some tests on fresh concrete to measure SCC workability characteristics. There are three characteristics of which are:

First, Filling Ability is the ability of fresh concrete to fill every space in the formwork without any air cavity. Filling Ability can be tested with Slump Flow Test. The diameter according to EFNARC is between 65-80 cm [6].
Second, *Passing Ability* is the ability of fresh concrete to flow and pass through obstacles, in this case is to pass through the tightly interconnected reinforcements. Passing ability can be tested with J-Ring Test. Height differences inside and outside of the J-Ring which meet the requirements according to EFNARC are between 0-10 mm [6].

Third, *Segregation Resistance* is the ability of fresh concrete to be able to survive the separation between materials so that it has high workability. Segregation resistance can be tested with V-Funnel Test. The requirement in this test according to EFNARC is the time it takes for the fresh concrete to pass through the V-Funnel 6 until 12 seconds [6].
2.2 SCC Mix Design
After passing some mix design trial, finally obtained a composition of 1m³ of concrete that meets the criteria of SCC characteristics:

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement</td>
<td>580</td>
</tr>
<tr>
<td>Water</td>
<td>125</td>
</tr>
<tr>
<td>Gravel</td>
<td>650</td>
</tr>
<tr>
<td>Sand</td>
<td>920</td>
</tr>
<tr>
<td>Superplasticizer</td>
<td>8.7</td>
</tr>
</tbody>
</table>

2.3 Samples Manufacture
SCC is inserted into cylinder molds of 15 cm diameter and 30 cm height. Some molds were opened after 1 day for compressive strength and tensile strength tests, while the rest opened after 28 days for compressive strength, absorption, and tensile strength tests.

<table>
<thead>
<tr>
<th>Tests</th>
<th>Variation of Silica Fume Substitution</th>
<th>Number of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive Strength at 1 day of age</td>
<td>0% 5% 10% 15%</td>
<td>12</td>
</tr>
<tr>
<td>Absorption at 1 day of age</td>
<td>3 3 3 3</td>
<td></td>
</tr>
<tr>
<td>Tensile Strength at 1 day of age</td>
<td>3 3 3 3</td>
<td>12</td>
</tr>
<tr>
<td>Compressive Strength at 28 days of age</td>
<td>3 3 3 3</td>
<td>12</td>
</tr>
<tr>
<td>Absorption at 28 days of age</td>
<td>3 3 3 3</td>
<td></td>
</tr>
<tr>
<td>Tensile Strength at 28 days of age</td>
<td>3 3 3 3</td>
<td>12</td>
</tr>
</tbody>
</table>

Total of Samples 48

3 Result and Discussion

3.1 Concrete Compressive Strength
Compressive strength of concrete produced on 1 day and 28 days are as follows.

![Graph of Concrete Compressive Strength at 1 day and 28 days of age](image)
The optimum compressive strength of the 15% silica fume substitution is 19.85 MPa (13.362% increase compared to the normal concrete) at 1 day of age and 57.18 MPa (30.266% increase compared to normal concrete) at 28 days of age. It can be concluded that the larger the substitution of silica fume, the higher the compressive strength of the concrete.

3.2 Tensile Strength
Tensile strength of concrete produced on 1 day and 28 days are as follows

![Tensile Strength Graph](image)

**Fig. 5.** Graph of Concrete Tensile Strength at 1 day and 28 days of age

The substitution of silica fume on the concrete does not appear to affect the tensile strength of the concrete.

3.3 Absorption
Concrete absorption value after 28 days can be seen in the following table.

![Absorption Graph](image)

**Fig. 6.** Concrete Absorption Value

The lowest absorption value of concrete is on 15% substitution of Silica Fume. This is because the size of very small particles of silica fume can fill the pores that exist in the concrete so that the water is difficult to enter through the capillary pore of concrete.
4 Conclusion

The lowest absorption value of concrete is on 15% substitution of Silica Fume. This is because the size of very small particles of silica fume can fill the pores of the that exist in the concrete so that the water is difficult to enter through the capillary pore of concrete. Therefore, the more silica fume, the lower the absorption value of the concrete.

The optimum compressive strength of the 15% silica fume substitution is 19.85 MPa (13.362% increase compared to the normal concrete) at 1 day of age and 57.18 MPa (30.266% increase compared to normal concrete) at 28 days of age. It can be concluded that the larger the substitution of silica fume, the higher the compressive strength of the concrete. The substitution of silica fume on the concrete does not appear to affect the tensile strength of the concrete. The use of the type F superplasticizer Viscocrete 8045 has a major impact on the initial compressive strength of the concrete.

References

Development of Mathematics Learning Books for Primary Teacher Education Students

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Abstract. This study aims to compile a book for elementary mathematics learning media for students of the faculty of education, Medan State University. This elementary school mathematics learning book is compiled based on observations on lecturing time. It is seen that the learning resources used by the lecturers are dictates that have been prepared for a long time without being revised to upgrade the material contained in the dictates so that they are in accordance with the current curriculum. The specific objectives of this research are: developing a book of elementary mathematics learning media which will be used by students of the faculty of education in the lecturing process replacing the dictates they have been using. This research uses Developmental Research. The subject of this research is students of the faculty of education in Medan State University. In the early stages, observations were made during the lecture process and continued by conducting interviews with students. From the results of the observations and interviews, an initial draft of the elementary school mathematics learning book was compiled. Furthermore, the draft of the elementary mathematics learning media book was validated by a team that aims to assess the quality of the elementary mathematics learning books so that an effective learning media book will be compiled. The results targeted in this study are effective elementary mathematics learning books that will later be used by students of the Faculty of Education of Medan State University, replacing the long-used dictates.

Keywords: Books, learning media, mathematics, elementary school.

1 Introduction

Learning is a complex process that happens to everyone and lasts a lifetime, from the baby to the grave later. One sign that someone has learned something is a change in behavior in him. Changes in behavior are both knowledge (cognitive) and skills (psychomotor) as well as those relating to values and attitudes (affective). Learning activities can be done anywhere. Higher education is one of the institutions where humans learn. Learning activities in universities, especially in the faculty of education science (FIP) UNIMED is a process of interaction or reciprocity between lecturers and students which is the forerunner of education staff who will teach at the elementary school level after completing their education at the elementary school teacher education level (PGSD) at the faculty of education in Medan State University.

The lecture process that has been running in the faculty of education especially feels very lacking to be able to equip and facilitate students to have the skills needed when they later become educators after completing education at the faculty of education. Various skills that should be obtained that are needed in the learning process in the classroom, seem to have not
been obtained clearly and in detail. This is because in the lecture process the teaching staff still uses learning resources (dictates) less in accordance with the development and demands of the needs in the current learning process in the classroom. The learning resources used by the teaching team tend to be long enough without any revisions at all. The use of such learning resources causes the ability of students in various matters to be still very low. One of them is the understanding of students in designing and using learning media needed for the teaching and learning process that is still very low.

The use of media in the learning process is expected to make the learning atmosphere more interactive, so that students will be able to explore all their abilities to find the concepts being studied. Besides that, with an interactive atmosphere where students are able to promote good communication with their own friends and with the teacher. Learning media developed by teachers are believed to be able to assist students in improving their learning achievement in school. Learning media should be designed and developed by the teacher before the learning process takes place. The ability to design and make learning media certainly does not come by itself, but must be trained and honed as often as possible. Provision of the ability to understand how to design and make learning media must be owned by a teacher so that later the teacher is able to design learning media that is appropriate to the needs of students in understanding a learning concept. All abilities and understanding of the media should be obtained by the teacher when the teacher studied at the university where he was studying.

The main problem of this study is that the learning resources used by teachers still focus on the use of dictates that have been made for a long time without any revisions being made. This causes the ability and understanding of students not to develop in accordance with the development of knowledge itself. Students do not have knowledge and understanding of new things. This is certainly very influential in the quality of prospective teachers who will be produced from this college. The faculty of education which should produce educators who are reliable and have good abilities when becoming teachers will not be realized.

Responding to the problems above this study aims to design a book of elementary school mathematics learning media which later can be used by students and the teaching team as a substitute for dictates that have always been used when face to face in lectures. This is considered very important because the ability of students to design learning media is needed when students become teachers. In addition, the materials that will be described in the elementary mathematics learning media book are materials that are in accordance with the media which is the learning material contained in the elementary mathematics education books. It is believed that with the use of this elementary mathematics learning media book, students will have the skills in designing elementary mathematics learning media which will be very useful for them later after becoming a teacher in elementary school.

Of the various problems described above, the focus of the problem that will be examined in this study is limited to the development of mathematics learning media books based on realistic mathematics using the 2013 scientific approach to curriculum that will be used for students of the State University of Medan PGSD replacing the dictate that has been used.

The formulation of the problem that can be developed from the limitation of the above problem is how the effectiveness and usefulness of the mathematics books based on realistic mathematics using the 2013 scientific approach to curriculum in providing insight to students of PGSD FIP Medan State University about mathematics learning media for elementary school students?

The purpose of this study is the development of elementary mathematics learning media books. The book of elementary mathematics learning media is expected to be used by students and lecturers in the lecture process at the faculty of education, Medan State University
replacing the dictate that has been used. In addition, the book development of elementary school mathematics learning media is also expected to be able to open horizons for elementary school teachers in the city of Medan in designing and using learning media, especially mathematics media at the primary school level where they are assigned.

1.1 Theoretical Review

1.1.1 Book

Textbooks are books used by teachers as a reference source in the implementation of the learning process for the teaching participants [1]. There are three ways that teachers can use in compiling textbooks, namely repackaging information, writing themselves, and rearranging. Textbooks can also come from research results. Efforts that can be made to make research-based textbooks are the way the author must first do research and report the results of his research.

Generally textbooks have several characteristics or characteristics such as: (1) using systematic structure and sequence of contents, (2) explaining instructional objectives to be achieved, (3) motivating students to learn, (4) anticipating student learning difficulties, (5) provide sufficient training for students, (6) provide a summary, (7) teaching materials are independent [2]. The existence of basic competencies (KD) and learning objectives that must be achieved by students, has forced teachers to develop teaching materials in accordance with it. Teaching materials will be more meaningful if the material contains contextual content and is in the student's daily environment [3].

1.1.2 Media

The word media comes from Latin and is a plural form of the word medium which literally means intermediary or introduction. Media is an intermediary or messenger from the sender to the recipient of the message. Media or teaching aids or audio-visual aids (A.V.A) are tools to help in learning. The teacher uses these tools when explaining the lessons to prevent verbalism (memorization or not understanding the clear meaning) According to Blake and Horalsen, media is a communication channel used to convey messages between sources (message providers) and recipients’ message. Mc.Luhan, found that media is a channel, because it conveys the message (information) from the source of the information to the recipient of the information.

According to Hamidjo, media are all forms of intermediaries used by humans to convey or spread ideas so that ideas or opinions or ideas that are presented to arrive at the recipient in the broadest sense of the media are every person, material or event that gives learners the opportunity to gain knowledge, emptiness and attitude. In this sense teachers, textbooks, school environments are included.

In a narrow sense, the media is limited to printed materials, photographs, electronic goods, mechanical devices, compiled images and verbal information. From various views, it is concluded that the media is everything that can be used to channel messages from the sender to the recipient, so as to stimulate students' thoughts, feelings, attention and interests in a way that allows learning to occur.

1.1.3 Mathematics Learning Media

Mathematics lessons especially in basic education are now considered subjects that are very difficult to understand, mathematics learning requires very good reasoning, requires a high level of intelligence, not everyone can understand, so students are less interested in
participating in this lesson. Students feel that the mathematics learning provided by the teacher has been less interesting, boring and there is no variation at all in the learning process. Teachers in mathematics studies should need to use the media in teaching mathematics so that the learning process becomes more interesting so that students are not bored, so that students can be more serious when learning and can easily accept and understand the mathematical concepts taught. As for other reasons mathematics learning requires media such as:

1.1.3.1 Mathematical Objects are Abstract So That They Need Demonstration
With mathematics learning tools, abstract mathematical material presented into a more concrete approach, there is visualization, and the benefits of learning the material in everyday life. Meanwhile, to teach mathematics correctly and effectively in absolute students must use teaching aids to facilitate students know the concept of mathematical concepts.

1.1.3.2 Mathematical Material Is Not Easy to Understand
Material from mathematics is abstract, this makes mathematics material not easily understood by most students. Therefore, with mathematics learning tools students are required to participate more actively, they not only see, hear and pay attention, but they also have to do / practice, so minds on and hands on learning can be achieved, the concept is built by the students themselves. For example: in the elimination method, if presented in props, each step that must be done is not memorized by students but understood, they build their own concepts and they know the reason for doing each step.

1.1.3.3 Mathematical Hierarchy Is Strict and Rigid
In mathematics, there are material preconditions needed to be able to step on the next material. The hierarchy of learning according to Gagne must be arranged from top to bottom or up down. It starts with placing the abilities, knowledge, or skills that are one of the goals in the learning process at the top of the learning hierarchy, followed by abilities, skills, or prerequisite knowledge that they must master first so they can learn the skills or knowledge above. Mathematical hierarchy is rigorous and rigid, meaning that in solving problems requires defined rules, principles and concepts as a prerequisite, which requires concrete concepts as the next prerequisite.

1.1.3.4 Mathematical Applications Are Less Real
It can be felt by students that the application of mathematics is less real, even students only assume that mathematics is a collection of numbers and symbols. Therefore, media is needed so that mathematics can be applied to everyday life. Thus, students can also easily learn concepts in mathematics.

1.1.3.5 Learning Mathematics Needs to Be Focused
Mathematics is not easy to understand, and its rigid hierarchy makes students difficult to learn mathematics. Therefore, students must focus when the teacher is explaining mathematics material, while most teachers use the lecture method in their learning. As a result, students become tired and bored in learning mathematics, therefore teachers are required to have creativity in learning mathematics. Teaching tools can help teachers to convey ideas or ideas in mathematics learning so that students are more active and not bored.
1.1.3.6 The Image of Mathematics Learning Is Not Good

Students' current views on mathematics are not good, they think that mathematics learning is frightening, tense, bored and a lot of homework. This is because the teacher is unable to communicate rigid mathematics material so that it can be accepted and understood well by students. Mathematics learning in schools until now generally starts from the delivery of definitions or understanding of an object intuitively, followed by the operation of the object, and ends with giving examples then giving assignments or homework that is a lot as an exercise. In learning mathematics, many students assume that mathematics is difficult, full of formulas and numbers, so before the learning activities begin students have given up and feel they will not be able to master the subject matter to be delivered, this results in students being unable to actively participate in learning activities. Therefore, teaching aids can help teachers to change the paradigm that has been developing in society in general and students in particular.

2 Methodology

This chapter discusses systematically the method of developing a mathematics learning media book based on realistic mathematics using the 2013 scientific approach to the curriculum. The targeted research product is a book of mathematics learning media based on realistic mathematics using a scientific approach using a valid 2013 curriculum that will be used by faculty of education students of Medan State University in the field of elementary education.

2.1 Type of Research

This study uses development research methods to identify that developmental research is oriented towards product development where the development process is described as accurately as possible and the product is finally evaluated [5]. This research is also referred to as formative research where research activities are carried out in a cyclic process and are aimed at optimizing the quality of product implementation in certain situations [5]. In mathematics learning, this development research is applied in the repetitive activities of designing and testing the material products of mathematics learning [6]. The results of this study in the form of quality products theoretically, procedural methodology, and empirical.

This research activity was carried out in 2 (two) stages. Both stages are described as follows:

![Fig. 1. The research activity](image-url)
Phase I of this study is called the front-end analysis phase which is aimed at analyzing and determining the book of mathematics-based mathematics learning media using the 2013 curriculum scientific approach. This activity is followed by developing materials that are in accordance with each basic competency in mathematical material. Through justification, analysis and evaluation of competent mathematics education experts and elementary school teachers, a mathematics learning media book based on realistic mathematics was developed using the 2013 curriculum scientific approach. This study involved experts in the development of mathematics education from the North Sumatra Province Education Agency and other mathematical learning experts.

The data for the development phase of the book of mathematics learning media based on realistic mathematics using the 2013 curriculum scientific approach was produced by validation conducted by teachers, principals and 3 lecturers from Medan state universities. Validation is carried out using a validation format that has been prepared by the expert team. The aspects that become references to book validation of mathematics learning media based on realistic mathematics using the 2013 curriculum scientific approach are:

(a) Suitability of media and materials with 2013 Curriculum
(b) suitability of language usage in accordance with the level and character of students.
(c) ease of media in providing students’ understanding of the concept of the material being studied
(d) media image illustrations and catalogs for making media that are displayed are interesting, clear, and easy to understand
(e) ease of media to be replicated

The description of the research activities of mathematics learning media books based on realistic mathematics using the 2013 scientific approach to curriculum. The first phase of the research activity was carried out in Medan from April to August 2018. This study involved a validator team consisting of 3 mathematics education experts and 5 teachers.

The research activity began with the objective analysis activities carried out on January 22, 2018. The analysis of this objective was carried out to establish the basic direction and main objectives of development so that it could become the main benchmark in the development of realistic mathematics-based learning media books using the 2013 curriculum scientific approach. this is then compiled an appropriate alternative learning. In carrying out the analysis of objectives, viewed from the 2013 curriculum aspect. The subject developed in this mathematics learning media book is all the material contained in elementary mathematics lessons in the 2013 curriculum.

After the analysis of the objectives was completed, then on February 13, 2018 an analysis of the characteristics of students was carried out. Analysis of student characteristics is carried out through a study of student characteristics which include the level of cognitive development, ability, knowledge background, and socio-cultural background of students. From the results of this analysis will later be used as a reference frame in compiling a book of mathematics learning media based on realistic mathematics using the 2013 curriculum scientific approach.

The next activity in step 1 is the analysis of student needs. Analysis of student needs is carried out on February 26 to March 30 2018. Analysis of student needs is a review of the needs of faculty students at UNIMED education which includes the need to understand mathematical concepts, understanding in developing learning tools and how to design and use
learning media they will use after finishing education at universities in Medan State University.

The next stage of the activity was to compile a validation instrument. This activity was carried out through the activity of designing a measurement tool that will be used to assess the quality of the teacher's book based on references and input from a team of experts and mathematicians. The validation instrument that will be used is expected to be a filter so that the mathematics learning media books based on realistic mathematics use the 2013 curriculum scientific approach that is developed to be of higher quality.

The most important activity in this study is the preparation of a draft book of mathematics learning media based on realistic mathematics using the 2013 curriculum scientific approach (7 May - 24 July 2018). This activity is carried out step by step so that the mathematics learning media books are designed in accordance with the references, concepts, indicators that have been developed and all the criteria that have been established in the design of this mathematics learning media book.

After the draft of the teacher's book was developed, the next activity was to validate the draft of the teacher's book, validation activities carried out by the validator team that had been appointed in this study. In validating the book of mathematics learning media based on realistic mathematics using the 2013 curriculum scientific approach, the validator team used a validation sheet that had been developed and designed in previous activities. This validation activity aims to produce a draft book of effective mathematics learning media and can help students of PGIP FIP Medan State University to improve their competence in mathematics subjects. The validation activity of the teacher book draft was held on 30 July to 11 September 2018.

3 Result and Discussion

3.1 Result Validation of Expert Team

Validation is carried out by teachers and expert teams from universities. The validator team validated using a validation sheet that was prepared in the research on the development of mathematics learning media books based on realistic mathematics using the 2013 scientific approach to curriculum. The validation results conducted by the validator team showed that the draft book of mathematics learning media based on realistic mathematics used the 2013 curriculum scientific approach already in good category. There are only a few in certain parts that must be revised and improved by the development team. Some input from the expert team as a validator team for realistic mathematics-based learning media using the 2013 curriculum scientific approach developed include: (a) The use of spelling that is still not consistent, (b) the clarity of language in the catalog each media still needs to be fixed, and (c) more media samples are added to facilitate student understanding.

In general, the validation results of the validator team for the development of mathematics learning media books based on realistic mathematics using the 2013 curriculum scientific approach can be seen below:

3.1.1 Suitability of Media and Materials with the Curriculum Used

The development of media and materials in the book of mathematics learning media is in accordance with the 2013 curriculum. In addition, the depth of material outlined is in accordance with the development of children in primary school. The material presented is very
accurate and by showing the accuracy in applying the concept of geometry in flat building in a simple, clear, easy to understand, and appropriate usage according to the subject matter, the material is presented using standard Indonesian.

The media is presented up to date in accordance with the latest mathematical developments. Examples of media presented encourage students to try it in an effort to find the concept of the material being studied. Media that is displayed further can foster student creativity.

### 3.1.2 Suitability of Language Use with The Level and Character of Students

Sentences used to present the contents of a logical text and refer to the Indonesian sentence rules. Languages that are used are straightforward in accordance with students' thinking abilities. Examples can provide abstract concept clarity. The concept description is concrete, students can find it, and if the abstract can be imagined by students.

The message is presented in an interesting language, easy to understand, communicative, and encourages students to read thoroughly. The illustrations presented clarify the material described. Illustration comes from the surrounding environment in accordance with the field of science. The sentence used to convey the message refers to the Indonesian grammar rules. Language used in explaining a concept in accordance with the development of students and in accordance with the level of emotional maturity of students.

### 3.1.3 Ease of Media in Providing Understanding of The Concept of The Material Being Studied

The media displayed is very helpful for students in understanding the various concepts being studied. This is because when students use the media, it is easy to answer various mathematical material concepts that are being studied with the help of the media contained in the learning media book.

### 3.1.4 In the Pictures and Catalogs that Are Displayed Interesting, Clear and Easy to Understand

The media images displayed in the book are very interesting for students. The media image is given a color printed clearly and attractively, giving rise to students' curiosity. In addition, all catalogs that are related to the media displayed are made in clear enough language so that students easily understand them. Steps that must be taken in making and using media are made in simple, coherent and clear language.

### 3.1.5 Ease of Media for Replication

The media displayed in the book, is a medium that is simple and easy to replicate and modify. Most media are made of simple materials that are easily found in the environment around students. Making media is very easy and harmless for students and teachers when using it.

### 4 Conclusion

This study aims to compile a book of realistic mathematics learning media using the 2013 curriculum scientific approach for students of PGIP FIP Medan State University as a
substitute for the dictatorship that has been used in an effort to improve the ability to understand mathematics subject matter in elementary school.

The results of the validation of the draft book of mathematics learning media based on realistic mathematics using the 2013 curriculum scientific approach conducted by the validator team consisting of a team of teachers and lecturers from universities, showed that the mathematics learning media book based on realistic mathematics uses the 2013 curriculum scientific approach designed included in the good category.

References


The Influence of Transformational Leadership, Intrinsic Motivation, and Job Satisfaction on Affective Commitments of State Vocational Teachers In West Nias Regency

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Abstract. The purpose of this study was to determine the influence of transformational leadership on teacher job satisfaction, intrinsic motivation on teacher job satisfaction, transformational leadership on teacher affective commitment, intrinsic motivation on teacher affective commitment, and job satisfaction on teacher affective commitment in state vocational schools. West Nias Regency. This research was conducted at State Vocational Schools in West Nias Regency. The study population was 160 teachers and to determine the number of samples used Issac and Michael tables, as many as 110 people with proportional random sampling technique. Data collection was carried out using a questionnaire, after the first trial was conducted. The data analysis technique used consisted of descriptive analysis, requirements analysis test, and path analysis with a significance level of α of 0.05. The results showed that transformational leadership was directly positive towards job satisfaction, intrinsic motivation had a direct positive effect on job satisfaction, transformational leadership was directly positive towards affective commitment, intrinsic motivation had a direct positive effect on affective commitment and job satisfaction had a direct effect on teacher affective commitments. To reduce the affective commitment the teacher can be done by increasing transformational leadership, intrinsic motivation and teacher’s job satisfaction.

Keywords: Transformational leadership, intrinsic motivation, job satisfaction, affective commitment.

1 Introduction

School as an educational institution or institution as a means to achieve educational goals through the learning process. Schools play a role as a means to implement education which is expected to be able to make the community more advanced. Therefore, the school as the center of education must be able to carry out its functions optimally and its role is to produce a great output of human resources and is expected to contribute to the nation’s development process in the future. In order to achieve these objectives, The Act No. 20 of 2003, concerning National Education Standards, stipulates eight Standards that must be met in implementing education. One standard that is assessed directly related to the quality of graduates indicated by the competence of graduates is the standard of educators and education personnel. Teachers as one of the main factors that determine the quality of education must be professional in carrying out their work in order to create quality education.
teachers must have good performance. And to produce good performance, a teacher must make commitments and agreements in the work that will be carried out. High commitment makes the teacher more responsible and will try to finish the job well and increase the motivation to teach the teacher. So that teachers are expected to carry out their duties well and produce better quality human resources.

Teachers who have affective commitment can realize the goals of education. so that each teacher must have a high affective commitment. There many factors that influence affective commitment include transformational leadership, intrinsic motivation, and job satisfaction. This study is aimed at analyzing the influence of transformational leadership, intrinsic motivation, and job satisfaction on affective commitments. From the above problems it is said to be worthy of research, namely research entitled the influence of transformational leadership, intrinsic motivation, and teacher job satisfaction on teacher's affective commitment.

1.1 Affective Commitments

Affective commitment is related to emotional, identification and involvement of individuals in an organization. Individuals who have this commitment have an emotional attachment to the organization that is reflected through their involvement and feelings of pleasure and enjoy their role in the organization. Individuals will continue to join the organization due to the desire to remain a member of the organization.

According to Schultz & Schultz affective commitment is also called attitudinal commitment (commitment as attitude), namely the situation when individuals consider the extent to which values and objectives are in accordance with the values and objectives of the organization. Individuals with this type of commitment will identify themselves with the values and goals of the organization, and want to maintain their membership [1].

Teacher's affective commitment is the willingness of the teacher to stay in the organization in this case school which is characterized by emotional attachment to the organization, identification of organizational values and objectives, and involvement in the organization, with indicators: loyalty, pride in the organization he works, participation in organizational development, considers the organization to be the best, and emotionally bound.

1.2 Transformational Leadership

In an organization or company, leadership is one important factor, leadership factors can provide a good influence on employees to maximize their work and achieve the desired goals of the company.

Swandari suggests that transformational leadership as a leader has the power to influence subordinates in certain ways. With the application of transformational leadership subordinates will feel trusted, valued, loyal and respectful to their leaders [2].

In the end the subordinates will be motivated to do more than expected. And O'Leary argues that transformational leadership is a leadership style used by a manager if he wants a group to widen its boundaries and have performance beyond the status quo or achieve a series of entirely new organizational goals [3]. Transformational leadership in principle motivates subordinates to do better than what can be done, in other words can increase the trust or confidence of subordinates who will influence the performance improvement.

Transformational leadership is leadership that gives motivation to subordinates to do better than what can be done, in other words can increase the trust or confidence of subordinates who will influence the performance improvement. The principal transformational
leadership indicator is (1) charismatic, (2) reformer, (3) visionary, (4) inspiration, (5) becoming a model and implementing motivation.

1.3 Intrinsic Motivation
Herzberg emphasizes that intrinsic motivation is directly related to the true nature of the work of people who do it in other words related to the content of the work [4]. When a boss does not provide motivational factors for employees not experiencing job satisfaction, with motivational factors employees enjoy job satisfaction and provide high performance. And Luthans asserts that motivation comes from satisfaction with the work itself. Individual intrinsic motivation is to do meaningful or meaningful work that has to do with intrinsic motives, namely the desire for meaning or meaningful work that has to do with intrinsic motives, namely, personal, responsibility, achievement, recognition, etc [5]. Intrinsic motivation is a motivation that encourages a person to excel in the individual, better known as motivational factors. Intrinsic motivation is a driver of work originating from within the worker as an individual in the form of awareness of the importance or benefits or meaning of the work carried out, with indicators: the desire to carry out work optimally, challenges and responsibilities at work, want to achieve, the desire to write good things.

1.4 Job Satisfaction
Daryanto said, "In general, the job satisfaction reflects the affective reaction from an individual to both the set of work and work related factors he/she is dealing with" which states that in general job satisfaction reflects the affective reaction of individuals to both collections of work and factors related to the work that he faces [6]. Also said Sagala, who argued that teacher job satisfaction is how the level of pleasure he feels towards the various kinds of work he does. Every person who works expects to get satisfaction from where he works [7]. Basically, job satisfaction is an individual thing because each individual will have different levels of satisfaction according to the values that apply in each individual. The more aspects of the work that are in accordance with the wishes of the individual, the higher the level of satisfaction felt.
Teacher job satisfaction is the statement of the teacher's attitude that is fun and loves his work as a result of the assessment of the experience gained in his work. Job satisfaction indicators are (1) the job itself, (2) salary, (3) promotion, (4) supervision, and (5) co-workers.

2 Methodology
The method used in this study is quantitative research using path analysis techniques with the aim of describing four variables namely: affective commitment (x4), transformational leadership (x1), intrinsic motivation (x2), and job satisfaction (x3). The population in this study were all State Vocational High School teachers, totalling 160 teachers. Sample selection applied to stratified is 110 teachers with simple random sampling. Data collection from this study was obtained by using a questionnaire. The questionnaire used is a Likert model. Each grid made into items with five categories: 5, 4, 3, 2, 1 for positive statements, and 1, 2, 3, 4, 5 for the otherwise. Data that has been obtained from this study are populations, so that the number of samples obtained described according to each variable. The general description of each variable is displayed in the form of an average score (mean), lowest score, highest score, median (Me), mode (Mo), standard deviation (SD), each variable studied. To examine the relationships between variables individually analyzed by simple correlation techniques.
While the relationship of independent variables together to the dependent variable used multiple correlation analysis techniques. Besides that the coefficient of determination is also calculated to determine the contribution of each independent variable to the dependent variable before searching for the required prices will first be made a table of frequency distributions and histograms for each research variable.

3 Result and Discussion

The study involved 110 respondents from 12 vocational schools. To get an idea of the characteristics of the score distribution of each variable, the following are presented: the highest score, lowest score, average price, range, standard deviation, median, and mode of each variable studied. To facilitate the description of each variable, the following is a descriptive statistical summary as shown in Table 1 below.

Table 1. Summary of Results of Analysis of Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Valid</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td>110</td>
</tr>
<tr>
<td>Mean</td>
<td>122.09</td>
<td>121.69</td>
<td>120.69</td>
<td>133.49</td>
</tr>
<tr>
<td>Median</td>
<td>121.00</td>
<td>118.50</td>
<td>120.00</td>
<td>131.00</td>
</tr>
<tr>
<td>Mode</td>
<td>120</td>
<td>120</td>
<td>125</td>
<td>130</td>
</tr>
<tr>
<td>Variance</td>
<td>136.267</td>
<td>223.060</td>
<td>154.362</td>
<td>366.931</td>
</tr>
<tr>
<td>Range</td>
<td>62</td>
<td>57</td>
<td>54</td>
<td>76</td>
</tr>
<tr>
<td>Minimum</td>
<td>98</td>
<td>98</td>
<td>97</td>
<td>100</td>
</tr>
<tr>
<td>Maximum</td>
<td>160</td>
<td>155</td>
<td>151</td>
<td>176</td>
</tr>
<tr>
<td>Sum</td>
<td>13430</td>
<td>13386</td>
<td>13276</td>
<td>14684</td>
</tr>
<tr>
<td>Minimum Ideal</td>
<td>35</td>
<td>35</td>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>Maximum Ideal</td>
<td>175</td>
<td>175</td>
<td>185</td>
<td>190</td>
</tr>
<tr>
<td>Men Ideal</td>
<td>105</td>
<td>105</td>
<td>111</td>
<td>114</td>
</tr>
<tr>
<td>Standard Deviation Ideal</td>
<td>23.33</td>
<td>23.33</td>
<td>24.66</td>
<td>25.33</td>
</tr>
</tbody>
</table>

The results of the analysis found that the principal's transformational leadership was included in the good category, teachers' intrinsic motivation included in the category of good, job satisfaction the teacher is included in the good category, and the teacher's affective commitment is also included in the good category.

Table 2. Summary of Analysis of Research Normality Test Variables

<table>
<thead>
<tr>
<th></th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td>110</td>
</tr>
<tr>
<td>Normal</td>
<td>122.09</td>
<td>121.69</td>
<td>120.69</td>
<td>133.49</td>
</tr>
<tr>
<td>Parameters(a,b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most Absolute</td>
<td>.071</td>
<td>.109</td>
<td>.071</td>
<td>.081</td>
</tr>
<tr>
<td>Extreme Positive</td>
<td>.071</td>
<td>.109</td>
<td>.071</td>
<td>.080</td>
</tr>
<tr>
<td>Differences Negative</td>
<td>-0.041</td>
<td>-0.060</td>
<td>-0.057</td>
<td>-0.081</td>
</tr>
<tr>
<td>Kolmogorov-Smirnov</td>
<td>.749</td>
<td>1.140</td>
<td>.744</td>
<td>.845</td>
</tr>
<tr>
<td>Z Asymp. Sig. (2-tailed)</td>
<td>.629</td>
<td>.149</td>
<td>.637</td>
<td>.473</td>
</tr>
</tbody>
</table>
Based on the results of calculations in the table above it can be seen that the value of Asymp. Sig (2-tailed) > 0.05. Thus, it can be concluded that the distribution of all data for each research variable does not deviate from the normal distribution, meaning the assumption of normality has been fulfilled.

![Empirical Causal Relations X1, X2, X3, towards X4](image)

Fig.1. Empirical Causal Relations X1, X2, X3, towards X4

Table 3. Summary of Direct and Indirect Effects of Transformational Leadership (X1), Intrinsic Motivation (X2) on Job Satisfaction (X3)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Directly to X3</th>
<th>X1</th>
<th>X2</th>
<th>Total Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>0,0400</td>
<td></td>
<td></td>
<td>0,0562</td>
</tr>
<tr>
<td>X2</td>
<td>0,1296</td>
<td>0,0162</td>
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<td>0,1458</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>0,0162</td>
<td></td>
<td>0,2020</td>
</tr>
</tbody>
</table>

Table 4. Summary of Direct and Indirect Effects of Transformational Leadership (X1), Intrinsic Motivation (X2) on Job Satisfaction (X3)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Direct to X4</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>Total Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>0,0562</td>
<td></td>
<td>0,0162</td>
<td></td>
<td>0,0880</td>
</tr>
<tr>
<td>X2</td>
<td>0,0924</td>
<td>0,0162</td>
<td></td>
<td>0,0288</td>
<td>0,1374</td>
</tr>
<tr>
<td>X3</td>
<td>0,0548</td>
<td>0,0156</td>
<td>0,0288</td>
<td></td>
<td>0,0992</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0,3246</td>
</tr>
</tbody>
</table>

Based on the results of the path analysis calculation, then it can be stated the direct and indirect effects of the research variables as follows:
First, proportional direct effect of transformational leadership variable (X1) on job satisfaction (X3) is 0.0040. This means that 4% of the variation in job satisfaction scores can be influenced by transformational leadership, while the remaining 96% is determined by other variables outside of transformational leadership variables.

Second, proportional direct effect of the variable intrinsic motivation (X2) on job satisfaction (X3) is 0.1296. This means that 12.96% of the variation in job satisfaction scores can be influenced by intrinsic motivation (X2), while the remaining 87.04% is determined by other variables outside of intrinsic motivation.

Third, proportional direct effect of transformational leadership variables (X1) on affective commitment (X4) is 0.0562. This means that 5.62% of the score variation of teacher's affective commitment can be influenced by transformational leadership, while the remaining 94.38% is determined by other variables outside of transformational leadership. The proportional effect of the variable intrinsic motivation (X2) on teacher's affective commitment (X4) is 0.0924. This means that 9.24% of the variation in the score of affective commitment is influenced by intrinsic motivation, while the remaining 91.76% is determined by other variables than intrinsic motivation.

Fourth, proportional direct effect of the variable job satisfaction (X3) on teacher's affective commitment (X4) is 0.0548. This means that 5.48% of the score variation of teacher's affective commitment is influenced by job satisfaction, while the remaining 94.52% is determined by other variables outside of job satisfaction.

Fifth, proportional indirect influence of transformational leadership variables (X1) on teacher's affective commitment (X4) through job satisfaction (X3) of 0.0562. This means that 5.62% of the score variation of teacher's affective commitment can be influenced by transformational leadership, while the remaining 94.38% is determined by other variables outside of transformational leadership. The proportional indirect effect of the variable intrinsic motivation (X2) on teacher's affective commitment (X4) through job satisfaction (X3) is 0.0924. This means that 9.24% of the variation in the score of affective commitment is influenced by intrinsic motivation, while the remaining 91.76% is determined by other variables than intrinsic motivation.

The results of the research that have been stated show that transformational leadership from the results of this study has an influence on teacher job satisfaction in West Nias District Vocational High School. The results of this study prove that teacher job satisfaction is related to the encouragement in the teacher to do the task as a willingness to strive to achieve the objectives of learning. In implementing the leadership of principals in schools, principals need to have the ability to carry out their leadership, including in the implementation of transformational leadership related to the ability to solve every problem faced by teachers in the implementation of learning in school.

The results of the research that have been suggested show that intrinsic motivation from the results of this study has an influence on teacher job satisfaction. The results of this study prove the importance of intrinsic motivation especially in West Nias District Vocational Schools in increasing teacher job satisfaction. Job satisfaction is a person's general attitude towards his job. A person with a high level of satisfaction shows a positive attitude towards his work, while a person who is not satisfied with his job shows a negative attitude towards his work. Motivational relationship to job satisfaction is motivation that is in someone
is a driving force that embodies a behavior in order to achieve the goal of self satisfaction, it can be added that the relationship of motivation to job satisfaction is when individuals are motivated, they will make positive choices to do something, because satisfy their desires. Motivation is related to satisfaction, where satisfaction can only be increased by high motivation, willingness and ability to perform tasks supported by a comfortable work environment.

The results of the research presented show that there is an influence of transformational leadership on teacher's affective commitment. This proves that the better transformational leadership in it will support the increasing affective commitment of teachers in West Nias District Vocational Schools. Transformational leadership is leadership that motivates employees to perform tasks well, and affective commitment is defined as a type of commitment that is related to an emotional attachment to someone. So that someone who has affective commitment in him then he will continue to work in the organization because they really want (want to) do that.

The results of the research that have been suggested show that there is an influence of intrinsic motivation on teacher's affective commitment. This proves that the better the condition of intrinsic motivation will support the increasing affective commitment of teachers in West Nias District Vocational High School. Intrinsic motivation has an influence on affective commitment, and in this study it is proven that teachers who have high motivation in him will tend to be more enthusiastic in carrying out work, and will lead to a sense of commitment in the teacher to maintain his commitment to the progress of the organization. Teachers who have high motivation will have affective commitment and they have the desire to contribute actively to the organization.

The results of the research that have been suggested show that there is an influence of job satisfaction on teacher's affective commitment. This proves that the better job satisfaction will support the increasing affective commitment of teachers in West Nias District Vocational High Schools. Job satisfaction will always be related to teacher's affective commitment. Affective commitment in this study is perceived as the teacher's attitude as a form of loyalty and teacher involvement in the school at work. Job satisfaction of a teacher in a school, will always be associated in a broader context, namely performance. When teacher performance increases, teacher satisfaction will also increase.

4 Conclusion

Based on the data and results of the analysis described above, some conclusions can be drawn as follows:

a. There is a positive direct effect between transformational leadership on teacher job satisfaction. This shows that the improvement of transformational leadership has resulted in an increase in the work satisfaction of teachers of State Vocational Schools in West Nias Regency.

b. There is a positive direct effect between intrinsic motivation on teacher job satisfaction. This shows that an increase in intrinsic motivation results in an increase in job satisfaction for teachers of State Vocational Schools in West Nias Regency.

c. There is a positive direct effect between transformational leadership on teacher's affective commitment. This shows that the improvement of transformational
leadership has resulted in an increase in affective commitment of teachers of State Vocational Schools in West Nias Regency.

d. There is a positive direct effect between intrinsic motivation on teacher's affective commitment. This shows that an increase in intrinsic motivation results in an increase in affective commitment of teachers of State Vocational Schools in West Nias Regency.

e. There is a positive direct effect between teacher job satisfaction on teacher's affective commitment. This shows that an increase in teacher job satisfaction has resulted in an increase in affective commitment of teachers of State Vocational Schools in West Nias Regency.

References


Pyrolysis of Plastic Waste into The Fuel Oil

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Abstract. Plastic distillation with pyrolysis method is one of the ways that can be used to convert plastic waste into useful chemicals and fuel oil. The purpose of this research is to design a simple plastic waste distillation design model, knowing the oil yield that can be obtained and the calorific value of oil from plastic distillation. The distillation device consists of a 12-liter volume reactor and a condenser with 0.5-Inch copper pipe formed spiral with a total length of 1.5 meters and liquid cooled. The test was carried out with 2 kg Polyethylene Terephthalate type plastic material per process with 3 variations of temperature of 300 ° C, 350 ° C, 400 ° C and using LPG as fuel. The test results, the highest amount of oil produced is 49 gr at a pyrolysis temperature of 400 ° C with the heating value obtained from the distillation oil is 1537 J / gr.

Keywords: Pyrolysis, distillation, plastic waste.

1 Introduction

Indonesia is ranked second in the world producing plastic waste into the sea which reached 187.2 million tons after China which reached 262.9 million tons. Every year, plastic production produces around eight percent of world oil production or around 12 million barrels of oil, equivalent to 14 million trees.[1] Most of the product packaging used today is made of plastic. Around the world, nearly 280 million tons of plastic material is produced every year, eventually being wasted on land or sea [2].

Uncontrolled disposal of plastic waste causes the environment to become carcinogenic to humans, birth defects, immune disorders, endocrine disorders, damage to the reproductive system [3]. Microplastic has been found in the sea around the world, suspected sea salt contains microplastic, because they are directly supplied by sea water. Figure 1. shows the test results for 15 brands of sea salt, lake salt, and rock / salt from supermarkets throughout China, found microplastic 550–681 particles / kg in sea salt, 43–364 particles / kg in lake salt, and 7–204 particles / kg in rock / salt. most microplastic particles are less than 200, contributing 55% of the total microplastic, and the most common microplastic are polyethylene terephthalate, followed by polyethylene and cellophane in sea salt [4].

Conventional hydrocarbon production in the world will soon decline. Hydrocarbon deficiency cannot be avoided unless there is a drastic change in demand or unconventional supply of hydrocarbons. Global conventional oil supplies are currently at political risk. This is because of the amount of conventional oil production of all countries in the world, except for the five major Middle Eastern suppliers, the maximum limit is limited by the limits of physical resources. If Middle Eastern suppliers decide to reduce supply substantially, deficiencies cannot be replaced by conventional oil from other countries. The world's conventional oil
supply will soon be physically at risk. Middle Eastern countries only have a small reserve operational capacity, and this will be increasingly demanded because oil production decreases.

Large investments in Middle Eastern production can increase production, but only to a certain extent. If demand persists, and if investment in large capacity in the Middle East is not made, the world will face the prospect of shortages in the near future. Even with large investments, the resource limit will force Middle Eastern production to decline rapidly, as well as conventional oil production globally. Estimates of global conventional oil production peaks between 5 and 10 years from now.

The world contains large amounts of non-conventional oils and various oil substitutes. But the rate of decline is very high. Conventional oil production causes these unconventional sources not to increase fast enough. The result is a continuing global oil shortage. For conventional gas, the world's original endowment may be almost the same, in terms of energy, as its endowment from conventional oil [5].

As an optimum waste-to-energy converter, the MSW pyrolysis system has experienced a recent increase in demand as a distributed MSW processing method. Pyrolysis is very different from gasification where it does not need oxygen at all. However the gasification with very low oxygen supply can significantly increases the heating value of the gas products as proven by Simanjuntak, et al (2015). By using a newly developed gasifier, they conducted gasification with a very low equivalence ratio (ER) where it’s not possible with a conventional one [6].

Literature studies and technologies related to MSW pyrolysis have shown that most industrial pyrolysis facilities are combined with gasification or combustion processes and are all equipped with gas scrubber.[7]. In the same thermal cracking parameters were applied, different volatile and residue fractions could be observed. As can be found, the yield of residue from virgin plastics was significantly lower at about 1.50 wt % compared to waste PP
and waste LDPE, which gave 19.55 and 7.33 wt % residue, respectively. The results are also in good agreement with TG analysis, which also can be obtained in TG curves. However, the yield of gases obtained from cracking of plastics both in virgin and waste was approximately equal changing from 13.67 to 15.60 wt % [8].

The conclusion of experiment [9], when the same thermal cracking parameters were applied, different volatile and residue fractions could be observed. As can be found, the yield of residue from virgin plastics was significantly lower at about 1.50 wt % compared to waste PP and waste LDPE, which gave 19.55 and 7.33 wt % residue, respectively. Sequential pyrolysis and catalytic improvement of Indonesian municipal plastic wastes have been done over Y-zeolite and natural zeolite catalysts. The results of the report [10] show that the feedstock types in a powerful manner affect the product yields and the quality of liquid and solid products. HDPE waste produced the highest liquid fraction. However, the heavy oil fraction was still high in the oil from HDPE waste. The highest diesel fraction has been produced in PE bag 2 while PE bag 1 produced highest gasoline fraction.

![Fig.2. Effect of different types of feedstocks on the product yields [10].](image)

## 2 Methodology

### 2.1 Material

The plastic used in this research is PET, which is a plastic water bottle that uses very much in Indonesia. They were obtained from the final disposal site and the small plastic recycling company in Medan city, Indonesia. Plastic bottles are chopped into 2-3 cm chips, then washed and dried in the sun for 5 hours.

### 2.2 Manufacturing of Pyrolysis Reactors

The experiment was started by designing a plastic pyrolysis reactor (Figure 1), the reactor was made of 30 cm diameter iron pipe, 15 cm long, 3 mm thick. The condenser is made of iron pipe with a diameter of 20 cm, 30 cm long, 3 mm thick.
2.3 Experimental Set-up.

A 3 kg of plastic is inserted into the reactor, the pump is turned on to drain the water through the condenser pipe, then the LPG heater is turned on to heat the reactor tube, the processing time is measured with a stopwatch, the condensation is held in a measuring cup, the remaining crust in the furnace is weighed, the rest LPG gas is weighed. This process is carried out at temperatures of 300, 350 and 400 °C.

3 Result and Discussion

In the Figure. 1 and 2 it can be seen that the increase in temperature is proportional to the increase in oil produced, the test is not passed to a higher temperature, because according to [11] the temperature of 500 °C, the percentage of oil will decrease, while the percentage of gas will increase.

![Fig.4. Effect of Reactor Temperature on Liquid oil produc yield](image)

This is in line with the results obtained [12], that the volume of oil increases on increasing the temperature from 450 to 500 °C with no wax component present in oil (density 0.71–0.73), while on further rise in temperature to 600 °C there was no increment in oil volume but increase in yield was obtained by increase in density from 0.73 to 0.79 caused by formation of heavier hydrocarbons in form of aromatics.
Equivalent to oil produced, an increase in reactor temperature is also followed by an increase in HHV (Figure 3), but according to [11] the temperature of 500°C HHV decreases, so that the experiment is not continued to a higher temperature.

4 Conclusion

A small pilot scale batch pyrolysis reactor has been used to convert PET plastic waste into liquid oil. The effect of process temperature on yield of liquid oil was studied. The results showed that at lower temperatures (300 °C), liquid oil yield was low. The optimum conditions for maximum liquid oil yield / feedstock of 0.25% and HHV of 1577 J/kg were achieved at 400°C.

Acknowledgements

Thankful to Workshop Pemesinan dan Fabrikasi Logam Universitas Negeri Medan and Dr. Janter P. Simanjuntak for valuable discussion and contribution.
References


Development of Management Model to Build Students’ Self Resilience from Drug Abuse

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Abstract. Self-resilience needs to be owned by every teenager, including high school students so that they can avoid various adverse influences one of which is drug abuse. The aim of this study is to produce products in the form of management models those are appropriate to be used to build students’ self-resilience from drug abuse, and measure the effectiveness of product development models to build students self-resilience from drug abuse. This research includes the type of research and development that refers 4-D model, namely defines, design, develop and disseminate. Research subjects were students of SMA Negeri 1 Tanjung Tiram, Batubara Regency. The results of the study show that the management model product developed has received an assessment form an expert validation, the assessment results stated that the products were appropriate to be used to build students’ self-resilience from drug abuse, and the product developed has been tested in small groups and field test, the results of the tested showed effective products used to build students’ self-resilience from drug abuse. Thus it was concluded that the management model developed was categorized as feasible and effective to be used to build students’ self-resilience from drug abuse.

Keywords: Management model, self-resilience, drug abuse.

1 Introduction

Generally high school students are teenagers who are very vulnerable to outside influences. The existence of various demands on the basis of its growth and development makes teenagers very vulnerable to any interference that can cause problems in their lives both personally and social problems. Of course the problems and adverse conditions that arise and are experienced by students (teenager) will not occur if the students have strong self-resilience so that they avoid all bad influences.

A students (teenager) needs to have a strong self-resilience that can be used as a stronghold of self-resilience to counteract the various influences and challenges that befall him. Students who have strong and positive self-resilience will certainly be able to fortify themselves from various bad influences that come from both inside and outside themselves. Conversely students who do not have strong self-resilience tend to think and behave in the wrong way which will have a negative impact on the life of the student itself.

Self-resilience can be interpreted as the ability of teenagers to adapt to conditions of change and pressure through flexible and healthy ways [1]. Self-resilience can also be interpreted as personal resilience. Personal resilience is a dynamic condition or appearance of a person that implies persistence, resilience and ability to develop the power to deal with and
overcome all forms of threats, challengers, obstacles and disturbances that come from within and from outside that directly or indirectly endanger integrity, identity, existence and struggle to pursue goals and ideals according to their vision (Soedarsono, 2000: 9). A person self-resilience can be also being in the form of adversity quotient. Adversity quotient is a person’s ability to fight and overcome problems, obstacles or difficulties they have and will turn them into opportunities for success [3].

Self-resilience is important for high school students because at this age it is a time that always wants to experiment with new things and is prone to negative influences such as being involved in alcohol, smoking, falling into sexual life or free sex even involved in drug abuse. Currently the problem that is experienced by students (teenagers) is drug abuse. Drug threats continue to overshadow people’s lives, causing parents to worry about the safety and safety of their children’s future [4].

The current phenomenon of drug abuse by high school students (teenagers) shows that in this phase, teenagers or students are in a very vulnerable period due to lack of experience and understanding of the knowledge provided about the dangers of drugs themselves. The young generation’s ignorance of drugs and personality turbulence and drug availability are the main problems in fighting drugs [5]. Drug abuse is caused by several factors, namely social environmental factors such as curiosity motives, opportunities, facilities and infrastructure, and personality factors such as low self-esteem, emotional and mental [6]. Factors causing drug abuse are family factors, personality factors and opportunity factors [5].

The high school students need to be equipped with strong and positive self-resilience to avoid association and lifestyle that can damage themselves including avoiding drug abuse. To be able build self-resilience of students, in order to avoid the influence of drug abuse it is necessary to develop a management model that can develop awareness of critical thinking, self-confidence, play and active role, be responsible and encourage students’ ability to have the depth of interpreting social phenomena in their lives including the phenomenon of influence drug abuse and its dangers.

Management is to organize and regulate all activities so that they can be carried out as well as possible, precisely, directed and completed and can be accounted for [7]. Management can also be interpreted as a process or framework, which involves the guidance or direction of a group of people towards organizational goals or real intentions [8]. The main functions of management included planning, organizing, actuating and controlling.

This aim of study is to produce product in the form of appropriate management models to build students’ self-resilience from drug abuse, and measure the effectiveness of product development management models to build students’ self-resilience from drug abuse.

2 Methodology

This study uses a research and development approach modified from Borg and Gall [9]. The development model used in this research and development is 4-D development model proposed by Thiagarajan and Semmel [10], which consists of four stages, namely define, design, develop, and disseminate.

The define phase included 5 (five) main steps, namely: front end analysis, student analysis, task analysis, concept analysis, and formulation of objectives. The analysis was conducted at SMA Negeri 1 Tanjung Tiram, Batubara Regency by observing, conducting in-depth interview with teachers about student ‘self-resilience (teenagers) and conducting Focus
Group Discussion (FGD) for several students (teenagers) who were used to raise and establish basic problems to build student 'self-resilience especially against drug abuse.

The design phase is carried out to prepare materials and design products to be developed, including the preparation of validation questionnaire instruments by material and media experts, as well as the effectiveness questionnaire used to see the valid and effective models developed. The media developed in the form of modules about the management model to build students self-resilience from drug abuse that contains introduction, types and dangers of drugs, model of students self-resilience management from drug abuse (planning, organizing, actuating and controlling).

The development phase was carried out through 2 (two) steps, namely expert assessment followed by revisions and development tests. The purpose of this development phase is to produce a final form of a module management model to build students self-resilience from drug abuse after going through a process of validation and revision based on expert advice. Expert validation included a validation of material expert who assess the product on aspects of content feasibility, language feasibility and presentation of feasibility aspects, and validation of media experts who assess the product in terms of module display, language feasibility and product feasibility.

The disseminate phase is the final stage in which the development product is promoted so that it can be accepted by users both individually, in a group or system. In the deployment phase which was seen was the developed modules, their effectiveness could be seen from the effectiveness test by using students’ self-resilience from drug abuse questionnaires.

The research and development subject consists of: two validators’ questionnaire instruments; two expert validators namely materials experts and media experts; and SMA Negeri 1 Tanjung Tiram students. Data collection techniques and instruments use interview guidelines, observation, questionnaire and documents. Data analysis was carried out in several stages: First, analyzing the needs, objectives, materials, preparation, implementation and evaluation of the development of students’ self-resilience management models through interactive analysis with data collection steps, data reduction, data display and conclusions; and second, analyzing the effectiveness of students’ self-resilience management models by analyzing the results of student questionnaires based on the result of field tests.

3 Result and Discussion

3.1 Development Research

The result of this research and development are management models to build students’ self-resilience from drug abuse, developed by the 4-D method proposed by Thiagarajan and Semmel [10] including define, design, develop, and disseminate.

In the define phase, an analysis of the needs of students as teenagers is done by analyzing students’ self-resilience from the influence of drug abuse by conducting Focus Group Discussion (FGD) to 10 students including tenacity, resilience, ability to develop self-strength, ability to face challenges that come. The results of interviews with Counseling Guidance teachers and FGD result with 10 students (recommendation of Counseling Guidance teachers) in SMA Negeri 1 Tanjung Tiram obtained information that some students tended to have smoking habits, skipping school, lack of learning enthusiasm, low self-esteem, pessimism, easily influenced by friends, lack of understanding of types and dangers of drugs, and have negative self-resilience. In addition, high school students quality as teenagers and make it
possible to be a development model. Based on the result of the analysis in the define phase, it was determined that the products developed in the form of modules.

The planning or design phase is a stage of develop a management model to build students’ self-resilience from drug abuse whose development is arranged in modules and validation questionnaire instruments by material experts and media experts as well as questionnaires on the effectiveness of product development.

The development phase was carried out through two steps, namely assessment by material experts and media experts followed by revisions based on expert suggestions and development testing. The results of the development stage include the result of expert material validation and media expert validation result.

The disseminate phase is the final stage in research and development where the development products are promoted so that they can be accepted by users, individuals, group or systems. This stage is the stage of using the device that has been developed on a wider scale and aims to test the feasibility of using the product. After the product is declared valid by the validator, the next step is the deployment stage. In the deployment phase which is seen or assessed is the effectiveness of the module being developed, its effectiveness can be seen from the effectiveness test by using a questionnaire sheet about students’ self-resilience from drug abuse. The effectiveness of the product was obtained through field tests conducted on SMA Negeri 1 Tanjung Tiram students, namely a small group test with 10 students and a large group with 30 students.

3.2 Product Validation Results

Products are developed in the form of modules on management models to build students’ self-resilience from drug abuse. The products developed are then evaluated or validated by material expert and media expert. Validation result by material expert can be seen in table 1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Assessment Indicator</th>
<th>Average Score</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Feasibility of Content</td>
<td>3.4</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Feasibility of Language</td>
<td>3.8</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>Feasibility of Presentation</td>
<td>3.4</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>3.5</strong></td>
<td><strong>Good</strong></td>
</tr>
</tbody>
</table>

Assessments from material expert obtained average rating with good categories as well as some suggestions from material expert such as more compacted material and supporting images/illustrations of more adapted material. Based on the result or subsequent evaluation, revisions were made according to the suggestions from the material expert. The result of the validation by material expert concluded that the module developed was declared valid and feasible to use according to the feasibility of the content, language, and the feasibility of presenting the material.

The products developed were also evaluated and validated by media expert on aspects of module display, language feasibility and product feasibility. Validation results by media expert can be seen in the table 2.

<table>
<thead>
<tr>
<th>No</th>
<th>Assessment Indicator</th>
<th>Average Score</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Module Display</td>
<td>3.6</td>
<td>Good</td>
</tr>
</tbody>
</table>
The results of validation by media expert obtained an average rating with good categories and for the feasibility of the product obtained an assessment with a very good category, with some suggestions from media expert including improving the size of the module so that it is easy to use and improve the layout of text and images. Based on the results of validation by media expert it was conclude that the developed modules were declared valid and feasible to use.

3.3 Product Effectiveness

After the revision is done according to be the suggestions of the expert validator and module developed has been declared valid and feasible, then the next steps are the stage of packaging and distributing the product. In the deployment phase, the effectiveness of the product will be tested using a questionnaire instrument given to high school students as the target of the user. The effectiveness test was carried out in two stages: small group test (10 students) and large group test (30 students). The results of the product effectiveness test can be seen in the table 3.

<table>
<thead>
<tr>
<th>No.</th>
<th>Effectiveness Test</th>
<th>Percentage (%)</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Small Group (10 students)</td>
<td>79.2</td>
<td>Effective</td>
</tr>
<tr>
<td>2</td>
<td>Large Group (30 students)</td>
<td>77.6</td>
<td>Effective</td>
</tr>
</tbody>
</table>

The results of the small group test (10 students) obtained a percentage of 79.2% and the results of the large group test (30 students) obtained a percentage of 77.6% or categorized as effective. Thus, based on the results of the field test, it was concluded that the product management model developed effectively was used to build students’ self-resilience from drug abuse.

4 Conclusion

Based on the results of the research that has been carried out, it can be concluded that the management model to build students’ self-resilience from drug abuse developed using the 4D development model proposed by Thiagarajan and Semmel, included the stage of define, design, develop, and disseminate. The product management model to build students’ self-resilience from drug abuse developed has received assessment and validation from material expert and media expert, the results of the assessment state that the product is valid for use in building students’ self-resilience from drug abuse, in terms of the feasibility of the content, language, presentation, display of modules and aspects of product feasibility.
Products developed have also been tested for effectiveness in small groups (10 students) and large groups (30 students). The results of the effectiveness test show that effective product management models are used to build students’ self-resilience from drug abuse. Thus it was concluded that the management model developed was in the valid and effective category used to build students’ self-resilience from drug abuse.

The management model to build students’ self-resilience from drug abuse is expected to be used as guidance for teachers, parents and students in an effort to build strong and positive self-resilience in facing various challenges and bad influence that come including the influence of drug abuse, so students have the ability and strength to say “no” to drugs.

References


The Development of Video Tutorial on Traditional Dance Internalized by Character Education in Cultural Arts Subjects

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Abstract. This study aimed to produce traditional dance video tutorial products internalized with proper character education for students of X grade of Medan Private High School as well as knowing the effectiveness of traditional dance video tutorial products internalized character education towards student learning outcomes. This study used a research and development (R & D) research model with 50 test subjects and 10 people as validators of media design, material and learning. The results of this study produced traditional dance video tutorial products internalized by character education that was “very feasible” to be used. The product developed showed that there were significant differences between learning outcomes before and after using the product, where learning outcomes after using multimedia were higher than before using multimedia. Besides that it was also being able to develop students’ character, namely cooperation, tolerance and courtesy.

Keywords: Video tutorial, traditional dance, character education.

1 Introduction

Starting from the 2013/2014 academic years, the government has implemented the 2013 curriculum. In learning the 2013 curriculum, in addition to cognitive goals, learning media must also contain attitudes and character values and skills that would be achieved by students in learning. It was done to minimize and suppress shifts in students' behavior and morals, for example cases of fighting between students, promiscuity, sexual harassment, violence during school and students orientation, demonstrations that lead to chaos, Bullying cases at school, students cheating on exams, and most often is a violation of school discipline, even recently there have been many violations committed by teachers and educators by students and parents. The phenomenon of student behavior like this demanded an improvement in the quality of education in the field of character.

Expressing yourself through traditional dance works was one part of the material in the Cultural Arts lessons at school. In learning students were required to be able to practice traditional regional dances. But in reality the discussion of this material has not inculcated the character education in it even though it indirectly stated that traditional dance already contained the character values of cultural traditions. But in the city of Medan itself, there was a multiethnic community so that each ethnic group has a different cultural tradition so it was difficult for students to understand if there was no specific explanation from the teacher regarding to the character values implied in traditional dance. The development of national
character has a very broad and multidimensional urgency [1]. The lack of students' sense of responsibility in preserving the traditional arts of the region results in a loss of love for the homeland which consisted of various cultures.

The use of technology and information for learning has also encouraged a shift in learning from conventional learning to independent learning so that the impression of learning will be better understood and remembered by students [2]. Multimedia learning was an intermediary used to convey learning material from teachers to students. With the use of multimedia learning, learning activities became more effective, more efficient, more interesting, and able to represent the delivery of material that cannot be said through certain words or sentences. Thus, students were more easily digest learning material than without multimedia assistance. It was also supported by the "Conical Experience" from Edgar Dale. Edgar Dale stated that, learning that was designed using multimedia that was able to create a learning experience directly will increase students' understanding of the concepts contained in learning [3].

At that time, many methods and strategies were used by Art Culture teachers with the aim of facilitating the teaching of dance forms to students, one of them was using audio visual media in the form of dance videos. But most of the dance videos used were videos that show intact dance forms from beginning to end without pauses. In addition there was no traditional dance video that explained in full about the values of the character of the educational culture contained in traditional dance.

Efforts to explore cultural values that have been owned by the community as a basis for the development of character education, and examine the effectiveness of the application were very important to be done in order to eliminate various deviant behaviors due to deterioration of noble character among students, and students were expected to be more interested and easier to understand and practice because these values have "lived" in the communities in which they live [4]. Considering the usefulness of multimedia learning and the problems described above, it is necessary to develop multimedia learning of art and culture, especially dance material in the form of traditional dance video tutorials that were internalized by character education. Implementing character education for students was an effort to make people better, not just good students [5].

This research was an effort to provide solutions to the problems in learning Culture Arts, especially dance art materials and planting cultural character values by developing traditional dance video tutorials internalized character education in arts and culture subjects at the high school level. In the development process using Adobe Premier CS6 software applications and various other supporting software.

2 Methodology

Based on instructional design models and Borg & Gall's model, the development procedures taken to produce media video tutorial products which explained in five (5) stages [6]:

a. Preliminary Research
b. Collecting materials
c. Making Design and Software Products
d. Product Feasibility Test
e. Product Effectiveness Test
The material in developing media tutorial video production was traditional Malay dance. The results of product validity were obtained from subjects consisting of four experts in learning materials, three instructional media experts, three learning design experts and the results of small and large group trials from students of X grade of Medan Private High School. Data collection instruments in this development were assessment instruments to assess products that have been developed. The main instruments used to collect data in this development were validation questionnaires, student questionnaires, and documentation. Fill in the questionnaire using a Likert scale where criteria for each score can be seen in the Table (Sugiyono, 2013: 65).

<table>
<thead>
<tr>
<th>Value</th>
<th>Criteria</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Very Good / Very Agree / Very Decent</td>
<td>76% ≤ X ≤ 100%</td>
</tr>
<tr>
<td>3</td>
<td>Good / Agree / Decent</td>
<td>51% ≤ X ≤ 75%</td>
</tr>
<tr>
<td>2</td>
<td>Not Go / Disagree / Not Eligible</td>
<td>26% ≤ X ≤ 50%</td>
</tr>
<tr>
<td>1</td>
<td>Very Bad / Strongly Disagree / Very Unworthy</td>
<td>0% ≤ X ≤ 25%</td>
</tr>
</tbody>
</table>

To prove a significant difference in student learning outcomes before using video learning products and after using dance video tutorial were tested with statistical calculations called T tests. In this case the statistical hypothesis that needed to be tested in this study were:

$$H_0 = \mu_1 \leq \mu_2 \quad (1)$$
$$H_a = \mu_1 > \mu_2, \quad (2)$$

Description:

$\mu_1$ = Average learning outcomes of dance students before using video tutorials from traditional internalized character education in learning.

$\mu_2$ = Average learning outcomes of dance students after using traditional dance video tutorials internalized character education in learning.

$H_0$ rejection and $H_a$ acceptance criteria:

The t test was done by criteria if $t_{observed} > t_{table}$, then $H_a$ was accepted at the level of $\alpha = 0.05$ with degree of freedom ($df = n - 1$).

3 Result and Discussion

Several aspects that became material for revising the product include several components, i.e. feasibility, presentation, graphics and linguistics to produce learning CD products that were suitable for use in art and cultural subjects. The product testing phase was carried out as follows [7]:

- Validation of material experts,
- validation by learning design experts,
- validation by video experts and graphic design,
- analysis of material validation results, learning design experts, video experts and graphic design,
- revision 1,
f. individual / one-on-one evaluation  
g. analysis of individual evaluation results one by one  
h. revision II,  
i. small group evaluation,  
j. analysis of small group evaluation results,  
k. revision III,  
l. field trial,  
m. analysis of field trial evaluation results,  
n. revision IV,  
o. the final product. This final product continued by testing the effectiveness of the product.

Data from material validators, media and learning designs in the development of traditional dance video tutorials internalizing character education in the Cultural Arts subjects in High School stated that traditional dance video tutorials that internalized character education were worthy of field testing with a revision process. Empirical average scores were categorized as "very good". From the results of data analysis obtained from the validation of material experts, learning design experts and media experts, the average percentage score of the three aspects of expert validators explained as follows;

![Fig.1. Rod Employment Diagram for Empirical Score Evaluation of Media Tutorial video on Traditional Dance Internalized by Character Education by Experts](image)

While the analysis of the evaluation results of the data ranging from individual trials, Small Group Trials, and Limited Field Trials if averaged, the percentage of empirical scores from the evaluation of the three types of tests was 96.20%, this percentage number was in the "very good" category, in other words traditional dance video tutorials internalized with character education that was feasible to be applied in the learning activities process and able to meet the active learning needs of students. The analysis of evaluation data starting from individual trials, small group trials, and limited field trials can be described in Fig. 2.
Based on the results of the suggestions and comments given in the feasibility test, the appearance of products revised by traditional dance video tutorials was internalized as follows:

Hypothesis testing was done by testing the data pretest data (before using the video tutorial) and posttest (after using the video tutorial) using the SPSS application called Paired Sample T-Test. Based on the results of hypothesis testing on the SPSS application, the output table explained that there were significant differences between before using traditional Tutorial Videos internalized by Character Education, after using traditional dance video tutorials, the character education was internalized. Where the average pretest score was 53.82 and posttest was 75.35 and the result was $T_{observed} = 20.70$ was greater than $T_{table} = 2.03$ concluded that $H_0$ was rejected and $H_a$ was accepted with the percentage of the average pretest score greater than on the posttest mean score.

Based on the observations of the teacher for two meetings in the study of Cultural Arts with the material of Concepts, techniques and procedures of Malay Traditional Dance, it was found that the average value of the character of students was Polite character for 81.25%, Cooperation for 87.50%, Responsibility for 61, 81%, Tolerance for 72.22%, Creative for 72.22%, and Discipline for 76.39%. Data can be seen in Fig. 5.
The results of data analysis, both validation and testing, show that the learning media developed were very suitable to be used by students in the learning of Cultural Arts. Besides that the video tutorial developed was able to improve learning outcomes because it can motivate students in following the learning process [8].

4 Conclusion

Based on the results and discussion of learning video media development research conducted it can be concluded that the learning video media developed were feasible and effective to be used as learning media for Pertwii high school students of Medan, because the average value of student learning outcomes was 75.35 exceeding the minimum completeness criteria in school 75.00. In addition, traditional dance video tutorial media internalized character education can develop students' character such as cooperation, tolerance and courtesy.

References


The Effect of Transformational Leadership of The Principal and The Ability of Management to Work Motivation of Teacher Guidance and Counseling at Senior High School of Medan

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Abstract. This study intends to determine the effect of transformational leadership of the principal and principal's management ability to the work motivation of teacher guidance and counseling at senior high school of Medan. In addition, also to find out which greater the effect of transformational leadership of the principal and the ability of management of work motivation of teachers' guidance and counseling in senior high school of Medan. The sample of this research is teacher guidance and counseling with amount of 148 people. This research method is descriptive percentage. The results of this study indicate that the effect of transformational leadership of the principal to the motivation of teacher guidance and counseling in senior high school of Medan with significant level observed > rtable (0,401 > 0,161) and also the effect of management ability to motivation of teacher guidance and counseling at senior high school of Medan with significant level is observed > rtable (0,261 > 0,161). From the data result above, it can be seen that the head master's transformational leadership is more influential on the motivation of teacher guidance and counseling work in at senior high school of Medan with observed 0,401.

Keywords: Transformational leadership, management ability, work motivation

1 Introduction

Guidance is part of an educational program to help students. Student as inhabitants of school need help because it is the stage of development where learners experience difficulties and obstacles due to lack of understanding of themselves and also the environment. Therefore, it takes counseling and guidance services that can accommodate the needs of learners.

Guidance and counseling is one part of influence the achievement of quality education. It’s seems like that guidance and counseling in Indonesian formally entered National Education beginning in 1975, at the time of enactment of the 1975 curriculum in schools for Indonesia. The importance of guidance and counseling services concerning the effort to facilitate students be able to develop their potential or achieve development stage (concerning physical aspects, emotional, intellectual, social, and moral-spirituals) [1]. Students as the main element of the school is an individual is growing so run into problems can affect the learning result. Therefore, the presence of counseling and guidance services in schools especially at senior high school becomes very necessary but, in the implementation, found various obstacles.
Many problems appear that is start from the amount of teachers' guidance is still limited so that every people who are not under graduate guidance must be lifted or "feel" is allowed to carry out the duties as a counselor so arise the impression that the guidance is not professional. Furthermore, the unequal ratio of teacher guidance and counseling with the student, with an ideal 1:150. In accordance with the Regulation of the National Minister No. 39 at 2009 concerning the Fulfillment of Teacher work load and Supervisor of the Education Unit, clause 1 Paragraph 6 mention that the teacher's teaching and guidance counseling load is capable of guidance and counseling of at least 150 student per year on one or more units of education.

Consequent of various disruptions and obstacles it becomes a fact that occurred in schools so far that indicates that the teacher mentor is still a lot or often perceived negative, such as a school teacher as a school cop, scary tutors, tutors only deal with children who have a problem. Such conditions are of course very detrimental to the smooth implementation of guidance in schools that resulted in did not get time to receive guidance services from teachers Guidance and Counseling. To overcome the problem a teacher counselling guidance should have a strong motivation.

In an effort to improve teacher motivation counseling guidance is certainly not easy if only expect from yourself but it requires a lot the factors of which are not less important the transformational leadership of the principal and also the ability of management. There are many factors causing misperceptions about counseling teachers in schools for internal or external. For Internal can be caused by motivation work, lack of competence or not maximal, level professional responsibility work is low, problems that occur or felt by the personal teacher counseling guidance. While external problems are caused by systems that not support, organizational culture is not good, counseling programs that are not clear or not run maximal, support leadership or principals are less optimal.

One of the internal factors is the motivation of work, the motivation of work is a soul impulse that makes a person moved to perform productive actions, both work-oriented money making or not. Working motivation of a worker is different, of course, and also different. There are workers who always seem to be in the spirit of work because they want a raise or promotion, it is natural. Motivation work can grow up and down. Not always excitement in work can continue to be at its maximum. Sometimes, a worker may experience a decrease in performance due to saturation in the work, or it could be due to various problems be faced. Someone will have a good performance if he has a strong motivation in working. This is analogous with research conducted from Komang Anik Yulia Arnita shows that transformational leadership and motivation have an influence of 54.4%.

Increasing work motivation is a role of a leader in an organization very dominant, so a leader has required to be able to move his subordinates be able to work hard in realizing the goal. In addition, the leadership ability of the principal is a key of factor in improving work motivation. The head master is the person responsible for nurturing counseling teachers, teachers and school staff to work optimals with their communities (head master, counseling teachers, teachers, and staff). Of course, this results in the entire organizational structure, which is felt directly on the ability of management and work motivation.

The principal has a strong formal authority and can be charismatic as a school leader so his authority there is a great concern when the principal is less able to manage. The success of the principal in running his school will not be separated from the ability of the principal. A principal is required to have readiness to managing the school. The readiness is concerned with managerial skills as a principal. The managerial capabilities intended are due to their ability to make planning, organizing, actuating, and controlling. With such capabilities, it is
expected that each leader can be a Encouragement and disciplinary enforcement for his subordinates so that they are able to demonstrate their work productivity very well.

Departing from the concept of Hersey in Sumidjo which states in the implementation of managerial duties required three kinds of skill areas, namely: technical, human and conceptual. By having the three basic skills mentioned above, the principal can perform the main tasks and functions in accordance with the provisions, so as to achieve the purpose of quality education. Therefore, the managerial ability of the principal is characterized by the ability to make decisions (decision making) and actions accurately, accurately and relevant.

The three principal managerial abilities are characterized from the ability formulate work programs, to coordinate the implementation of work programs, with the board of teachers and with others related in the education of a capacity in evaluating the school work program that has been implemented. Implementation of principal managerial abilities above, will eventually be focused on the implementation and achievement of education quality in the environment.

The statement above give illustrates that a leader must be able to manage all the resources that exist in the school, directing and at once influencing various activities that motivate in relation to the duties of its members under principal. With regarding to this research, leadership skills are required.

1.1. Work Motivation of Guidance and Counseling Teachers

According to Robbin motivation is a willingness to issue high levels of effort for organizational goals conditioned by ability of that effort in meeting some individual require. Requirement occur when there is no balance between what is owned and what is expected. Encouragement is a mental power that is oriented towards fulfilling the hopes and attainment of individual goals. Work Motivation is a number of physical and mental activities to do. Work motivation is a condition that has an effect on generating, directing and maintaining behavior related to work environment. Furthermore, according to Winardi work motivation is a potential power in a personity. Many work motivation is born from different approach, it happens because what is learned is a complex human behavior. So these theories are necessary for the organization in understanding employees (teachers) and directing employees (teachers) to do something. Lunenburg & Ornstein, motivation is defined as "those process within an individual that stimulates behavior and channels it in the ways that should benefit the organization as a whole". Motivation is explained in various forms of stimulus that can encourage individuals in performing various activities that will contribute to the overall organization.

1.2 Principal Transformational Leadership

Hughes et al. [2] suggests that transformational leaders have vision, rhetorical skills, and good impression management and use them to develop with strong emotional ties with their followers. Transformational leaders are believed to be more successful in encouraging organizational change because the emotion of followers and their willingness to work to realize the leader's vision.

The transformational approach is the most popular approach or perspective used in studying leadership rightnow, and has view according to the object to be examined. Antonakis et al. [3] defined transformational leadership as a behavior that is proactive, attention to the common interest to its members Reach the goal at the highest level. Khuntia and Suar [4].

Emphasize that in transformational leadership, leaders change the believe, values, and behaviors of followers, so that they are consistent with the vision of the organization. Khuntia and Suar [4] affirm that leaders who apply transformational leadership give effect their
followers by engaging their followers to participate in goal-setting, problem-solving, decision-making and feedback through training, direction, consultation, counseling, and monitoring of assigned tasks. The transformational leader is the leader who encourages his followers to change motives, believe, values, and abilities so that the personal interests and goals of followers can be aligned with the vision and goals of the organization (Goodwin et al. In [5] Krishnan [6] said that transformational leadership was changes and broadens the interest of its followers, and generates awareness of the acceptance of common goals and missions. Nguni [7] argument that transformational leadership requires increased levels of motivation from followers beyond the value exchanged and beyond what the followers expect, so followers can achieve higher levels of performance and self-realization. Asgari et al. [8] said that transformational leaders motivate their followers by inviting their followers to internalize and prioritize greater common interests above private interests. YAHI [9] suggests that transformational leaders make followers Be more aware of the interests and values of the work and persuade followers not to put their own self-interest on behalf of the organization. Leaders develop the skills and beliefs of followers to prepare them for more responsibility within an authorizing organization.

Rivai and Mulyadi [10] stated that transformational leaders motivation subordinates to do better with what their subordinates are supposedly doing by increasing the value of tasks, by encouraging subordinates to sacrifice self-interest in the interests of the organization accompanied with raising the level of subordinate needs to a better levels.

According to Robbins and Judge and Cavazotte [11], there are four components of transformational leadership:

(a) Idealized Influence (Ideal Influence)

Idealized influence is the behavior of leaders who provide vision and mission, bring a sense of pride, and get the respect and trust of subordinates. Idealized influence is also called a charismatic leader, where followers have deep confidence in their leaders, feel proud to work with their leaders, and trust their leader's capacity to overcome any problems.

(b) Inspirational Motivation

Inspirational motivation is the behavior of leaders who are able to communicate with high expectations, communicate visions together attractively using symbols to focus subordinate efforts, and inspire subordinates to achieve goals that produce important progress for the organization.

(c) Intellectual Stimulation

Intellectual stimulation is the behavior of leaders who are able to increase subordinate intelligence to enhance their creativity and innovation, improve rationality, and solve problems thoroughly.

(d) Individualized Consideration

Individualized consideration is the behavior of leaders who giving personal attention, treating each subordinate individually as an individual with different necessary, abilities, and aspirations, and coaching and advising. Individualized consideration of transformational leadership treats individual subordinates as individuals and accompanies them, monitors and make grow opportunities.

1.3 Management Ability

Ability management can be defined as the strength or ability to plan, organize and control the work in accordance with the intended purpose. The indicator of managerial ability in accordance with the opinion expressed by Winardi stated is managerial capability is the ability
to take the actions of planning, organizing, implementation, supervision made to achieve targets. Which has been setting. Indicators of managerial capabilities include:

(a) Planning. Planning is the function of a manager who deals with choosing the objectives, policies, procedures, and programs of alternatives. So, planning issues are the best "pick" problem from some of the alternatives.

(b) Organizing. Organizing is a process of determining, grouping, and regulating the various activities necessary to achieve the goal with put a people in each of these activities, providing the necessary tools, establishing authority that is relative delegated to each individual who will perform activities.

(c) Implementation. Implementation is an activity from a manager to guide, direct, and manage all activities of employees who have been given the task in carrying out a business activity, a manager must be able to give spirit their workers by giving motivation, be understand the personal relationships and group activities in completing the job.

(d) Supervision. Control activities are processes to ensure the goals of the company will be achieved. Control is essentially an effort to provide guidance to the executor so that they always act according to plan.

From the explanation above, it can be concluded that the ability of management is as strength or ability in planning, organizing and controlling work in accordance with the goals that have been determined with indicators: planning, organizing, implementation and evaluation.

2 Methodology

This research uses descriptive research method by using quantitative approach with survey method. According Kerlinger & Lee, survey research is into at assessing large and small populations by selecting and reviewing selected samples from population to find the incidence, distribution and relative interrelations of the variable. Population in this research is teacher guidance and counseling that existed in Senior High School of Medan with 238 people from 202 School. The sample was taken from morgan table and got 148 samples.

The data of this research were collected through the distribution of questionnaires designed in the form of likert scale and rating scale. On this scale the proposed statements are supplemented with four alternative answers and their weights for each alternative answer. The details are: very often (VO) given a score of 4, often (O) given a score of 3, sometimes (S) scored 2 and never (N) scored 1. To measure the level of goodness of the instrument, the researchers conducted a trial by administering the instrument on the subject of research as many as 30 counseling and guidance teachers in senior high school in Medan. The level of research is the validity and reliability.

The data obtained through the measurement results were analyzed using descriptive and inferential statistical analysis techniques. Descriptive analysis is intended to describe/describe data from each variable. Descriptive analysis of data is done by calculating the average price (M), standard deviation or standard deviation (SD), mode (Mo), median (Me), and range. The presentation of descriptive data is done through frequency distribution and histogram for each research variable. The next data analysis is to interpret the data by identifying the average difference between strata by using the average price and standard deviation of each variable.
After that, test the tendency of each variable by using average ideal (Mi) and ideal deviation standard (SDi) such as formula:

\[ Mi = \frac{\text{skor ideal maks + skor ideal min}}{2} \]

\[ SDi = \frac{\text{skor ideal maks + skor ideal min}}{6} \]  

(1)

Inferential statistical analysis used in this study is to use correlation path analysis, this method is used because researchers want to test the asymmetric relationship built on the study of teacher motivation theory of counseling and guidance work, management skills, and transformational leadership.

3 Result and Discussion

Data of Result the research data consisted of three variables, that is transformational leadership (X1), management ability (X2) and work motivation of teacher guidance and counseling (Y). The data is the result of the sum of score is scoring on each item for each question for each variable filled by the respondent. Packets are filled and returned as many as 30 ekslemplar. After the questionnaire which amounted to 30 eksplempar examined it turns out the whole eksplempar worth to be processed and analyzed. Data from the respondents are processed by stages: tabulation, making descriptive analysis, creating table frequency distribution of each aspect of the question, calculate correlation between variables, and test of hypothesis. A summary of descriptive analysis results is presented in the table:

<table>
<thead>
<tr>
<th>Analysist</th>
<th>Variabels</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amuont of data</td>
<td>148</td>
<td>148</td>
<td>148</td>
<td></td>
</tr>
<tr>
<td>Minimum Score</td>
<td>65</td>
<td>49</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Maximum Score</td>
<td>144</td>
<td>112</td>
<td>144</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>79</td>
<td>63</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td>Sum of class</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Interval</td>
<td>9,875</td>
<td>7,875</td>
<td>9,875</td>
<td></td>
</tr>
<tr>
<td>Average value</td>
<td>106,89</td>
<td>83,41</td>
<td>109,09</td>
<td></td>
</tr>
<tr>
<td>Standart Deviation</td>
<td>19,44</td>
<td>14,16</td>
<td>18,50</td>
<td></td>
</tr>
<tr>
<td>Mode</td>
<td>111,38</td>
<td>85,3</td>
<td>117,17</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>110,3</td>
<td>84,72</td>
<td>110,5</td>
<td></td>
</tr>
<tr>
<td>Minimum Ideal score</td>
<td>41</td>
<td>32</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Maximum Ideal score</td>
<td>164</td>
<td>128</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>Ideal average (Mi)</td>
<td>102,50</td>
<td>80,00</td>
<td>100,00</td>
<td></td>
</tr>
<tr>
<td>Standard Deviation Ideals (SDi)</td>
<td>20,50</td>
<td>16,00</td>
<td>20,00</td>
<td></td>
</tr>
<tr>
<td>Sum</td>
<td>15820</td>
<td>12345</td>
<td>16145</td>
<td></td>
</tr>
</tbody>
</table>

where:
X1: Transformational Leadership
X2: Management Capabilities
X3: Teacher Work Motivation of counseling and guidance teacher
From the calculation of correlation between variables used to determine the relationship for variables by using the formula Product Moment and obtained results that give meaning that between the principal transformational leadership with the motivation of teacher counseling and guidance work at senior high school of Medan there is a significant positive relationship with observed 0.401 and table calculations to find out the significance of transformational leadership of the principal to the motivation of teacher guidance and counseling work obtained tobserved 5.293. So, there is a significant influence between the transformational leadership of the principal on the motivation of teacher guidance and counseling work. This is supported by the theory according to Robbins. The style of transformational leadership is the style of leadership that makes the subordinates have a sense of trust, admiration, loyalty and respect for their superiors, so that the subordinates are motivated to do more than ever [12].

Furthermore, the ability of management with the motivation of teacher counseling and senior high school counseling work in Medan there is a meaningful relationship with observed 0.261. To know the significance of management ability to work motivation obtained tobserved 3.296. So, there is a significant influence between the ability of management to the motivation of teachers guidance and counseling at senior high school in Medan.

In addition, there are also results to give the meaning that there is a transformational leadership for relationship of principal and management ability to work motivation of teacher guidance and counseling with value of observed 0.331 and thitung 4.295. From this result, it is description of a significant influence between the transformational leadership of the principal and the ability of management to the motivation of high school teacher's guidance and counseling in Medan, 2016/2017. From the above data, it can be seen that the influence of transformational leadership of the principal greater than motivation of teacher counseling and senior high school counseling in Medan with observed 0.401 compared to management ability.

4 Conclusion

Based on the data found to shows that the correlation coefficient between principal transformational leadership variable (X1) and management ability variable (X2) with work motivation of guidance and counseling teacher is variables (Y) of 0.331 show positive relationship with the calculation of t test 4.295. There appears to be a significant influence between the transformational leadership of the principal and the management's ability to motivate teacher guidance and counseling work for Senior High School of Medan 2016/2017.

The scale correlation coefficient between transformational leadership variable with work motivation variable equal to 0.401 show positive relation with t test calculation 5.293 so that there is significant influence between transformational leadership to motivation of teacher counseling and counseling of senior high school of Medan.

The correlation scale of coefficient between management ability variables with work motivation variable of 0.281 shows a positive relationship with t test calculation 3.296 so that there is a significant influence between the ability of management to the motivation of teachers' guidance and counseling work at Senior High School of Medan.

From the results of the data above can be concluded that the influence of transformational leadership of the principal is greater than teacher work motivation guidance and counseling in senior high school of Medan with a value is 0.401.
References


Development of e-Book As A Teaching Material In Anatomy Physiology Course

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Abstract. This study had aims: to determine the effect of e-books on the students learning outcomes in Anatomy and Physiology of Beauty course; to improve the knowledge of the students in Anatomy and Physiology of Beauty course; to improve the competence of the students in Anatomy and Physiology of Beauty practical. The type of the research used in this study is Research and Development (R & D) by using the stages or procedures that have been adapted, such as: Needs analysis; develop the products; validation and revision; small group trials; medium group trials; large groups trials; final product. The subjects of these research trials are 30 students in first semester of Beauty Education in State University of Medan (UNIMED), which were tested on 3 small group students, 9 middle group students and 30 large group students. The expert validation consists of 1 media expert and 2 material experts. The instruments for collecting the data used in this study are using the questionnaires and tests; validator questionnaire and effectiveness questionnaire include the rating scale and techniques analysis the data using a Likert scale. The research results of media expert which took a percentage of 88.56% obtained the "very good" criteria and research result of material experts which took a percentage of 90.5% obtained the "very good" criteria; secondly, the results of small group trials expert which took a percentage of 67.7% obtained the "Good" criteria, the medium group trial which took a percentage of 80.33% obtained the "Good" criteria and the large group trial which took a percentage of 90.17% obtained the "Very Good" criteria; thirdly, the trial of effectiveness of students which took a percentage of 91% obtained the "Very Good" criteria. Thus, the development of E-book as a teaching material in Anatomy and Physiology of Beauty course is considered effective and feasible to be used as a learning media.

Keywords: Development of e-Book, anatomy, physiology, beauty material, skin and hair material.

1 Introduction

The Act No. 20 of 2003 on National Education System concerning the National Education System, section 1 of article 1 mention that education is a conscious and planned effort to realize a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by himself, society, nation and state. Based on this, it seems that what will be developed is the potential of beauty education students; they are human resources that are very important for the development and growth of a nation and state. Therefore, improving the quality of national education needs to be pursued with the right programs.
In generally, the problems above are faced by technology and vocational education institutions because technology as a studied object is a dynamic field (always developing) and have a part of global scope. Some of the courses taught are included in the technology field and have the global scope, including Anatomy and Physiology of Beauty.

The subject of Anatomy and Physiology of Beauty is closely related to the practice of the Hair and Skin Beauty Expert Package, such as hair care, styling, trimming, coloring, curling, straightening, smoothing and rebonding, facial, makeup, hand and foot care and body care. Therefore, before doing skin care and hair styling there are initial steps that must be known by the students, which is about the knowledge of skin type and hair type, with the aim of determining the ingredients, cosmetics, techniques and treatments that are appropriate to the client's circumstances. To be able to carry out these activities, the students must be competent in the subject matter of Anatomy and Physiology of Beauty.

This curriculum in this course is organized into 3 practice credits, where all the subjects given in the form of face to face during one semester are practicum activities. Whereas to fulfill the demands of the course in Anatomy and Physiology of Beauty is not enough to be obtained only through practical activities. Concretely this gap problem arises when several graduates are accepted to work in salons and open their own businesses. As according to the recognition of several alumni who are currently working in beauty salons and are engaged in makeup artists, it turns out that their academic abilities and skills are still not enough to carry out the job description. There are still many new things, especially regarding some skin care techniques and hairdressing that they haven't gotten in college so they still have to enrich their knowledge by digging it from outside academic sources, for example by taking courses, reading books and articles - articles in mass media, and internet use. From this it appears that although graduates are equipped with knowledge and skills from campus, in the end they are still required to study independently after entering the workforce. In connection with the excavation of knowledge outside academics, it can actually be done since the graduates are still attending lectures. There are several things that cause this activity not doing by the students. First, the lack of motivation and awareness from educators, so the students can’t see the importance of the knowledge and information outside of academics. Second, both educators and students are not able to see the benefits or effects of non-academic learning for enriching lecture material. Knowledge acquisition outside of academics can be done by using the internet. The use of the internet for educational purposes that is increasingly widespread, especially in developed countries, is a fact that shows that with this media it is possible to conduct a more effective learning process. This happens because the characteristics and characteristics of the internet are quite typical, so that it is expected to be used as a learning resource as other sources have been used previously such as radio, television, Interactive CD-ROM and the others.

Non-academic learning methods that will be examined here are learning resources by internet. Based on the current data (2008), shows the utilization of internet in Indonesia is only around 3.6% of 100 people in Indonesia (www.google.com/public). This reality illustrates that the reach of internet technology is still very limited, both by number of users and by location. The Anatomy and Physiology of Beauty course is a practical course which has 3 practical credits. Practical courses or often called practicums are learning strategies or forms of teaching used to teach together psychomotor (skills), understanding (knowledge), and affective (attitude) using laboratory facilities (Zainuddin, 2005).

The success of educators in teaching is determined by many factors such as planning, teaching preparation, teaching models, teaching media, facilities and other infrastructure [1]. Variations and innovations can take the form of learning media that can foster learning media
and crisis and independent habits that make cosmetology students more interested in attending courses. Learning media is used as a teaching aid. One of the learning media is e-book [2]. With use of this e-book learning media, it can help teachers to explaining the subject matter and make it easier to understand the material presented [3].

2 Methodology

This study uses Research and Development (R & D) methods. The R & D method is a research method used to produce a specific product and test the feasibility of the product. R & D is carried out through several stages. Each stage is an activity process that has the target to be produced. The subjects in this study is e-book learning media in Anatomy and Physiology of Beauty course. The object in this study is the Beauty Education students in third semester. According to Borg and Gall, the initial product trial can be done in 1 class with 30 respondents [4], while according to Sugiyono (2008), the instrument has been validated with judgment experts can be tested on 30 respondents [5]. Therefore, the respondents who will be used in the trial of e-book have been worthy are 30 people. The technique used in sampling is total sampling. From 1 class, there were 30 beauty education students. The procedure that was prepared is a procedure that has been adapted from the steps of development research, according to Sugiyono [6]. The steps of the research to find out the potential and the problems in the learning are conducted by: identify the potential and the problems. This stage begins with how to do an observation in the classroom by doing a survey to the lecturers on the subject matter that will be developed and analyzing the appropriate learning tools for the IQF, so that there will be no deviation between the material developed and the syllabus.

After observing the research, it will continue to the planning stage. Development of Basic Product In developing a product, there needs to be a validation process to find out which product will be developed is feasible or not for use. The media that has been created is then examined by material experts and media experts who aim to give points to the media product. The experts who will validate the media products are the experts in the field of measurement, which are the Lecturers of Education and the Lecturers of courses, and for material experts will be present the lectures experts of learning media. The beginning trial (in small group) intends to see whether there are deficiencies or weaknesses of media products before media products are used as learning media in the actual learning process. The beginning trial (in small group) will be done by 3 beauty education students. It has been explained above, from product trials that will be known the shortcomings of the media products that are made. From the results of the small group trial, the media will be revised before the next trial phase is carried out. Field trials (medium group) were conducted for 9 students. According to Sugiyono (2014) the selection of a simple trial group that uses the group members of each subject is between 9 to 20 students. Just like the small group trial, the 9 students were chosen by means of random sampling starting from the students who had high, medium and low abilities. The medium group trial was conducted to assess media products after being revised from the results of the previous beginning trials. Media Revision, from the results of the field trial (medium group) then revised is carried out in accordance with the results of the trial.

Field Test (large group) is a trial that is done the same as the previous trial. This field test is the final stage of a series of trials and as a testing stage after it is done to 30 beauty education students in third semester. Like the previous trial stages, the students will be given a questionnaire to assess the efficiency of the media created.
The product trial aims to find out the improvement of students' knowledge about physiology and beauty anatomy material after using e-book learning media. This trial was conducted by comparing the results of the students' test scores before using the e-book learning media (test) and the results of the students' test scores after using the e-book learning media (test). After passing the field test, all the critics and suggestions from the media that have been made will be the material revised from the media. This media revision will determine the results of media products later. Implementation is to convey the results of products to users. After revising the field test phase, the media products can be produced and can be used as learning media in subjects of physiological and beauty anatomical continental food knowledge. The techniques for collecting the data in this study were conducted in four ways, such as the interviews, observation, questionnaires, and tests. The interviews used in this study were classified as free interviews. This interview is used to find out the needs analysis. Respondents in this interview were lecturers of courses. The observation method used in this study is open observation. The activity was done by the researcher to obtain data about the circumstances / situations that exist when implementing learning. Observations in this study aim to observe and know the use of media, the use of teaching methods, and the attitudes of beauty education students in the learning process. This questionnaire is used to find out the results of validation or input on e-book learning media that has been generated. Validation was carried out by media expert lecturers, material expert lecturers, lecturers of courses.

Techniques for collecting the data in this study are about to reveal the data of physiological and beauty anatomy knowledge in Anatomy and Physiology of beauty before and after using e-book, namely by doing a pretest and posttest. The test used in this test is multiple choice with a total of 40 items. The instrument for collecting the data is in the form of a questionnaire on the quality of learning media and the suitability of the material. This assessment sheet is a check list adapted from the Belawati Tian instrument in his book Learning Media Development with further development by researchers. Data collection instruments in this study are: Product Development Assessment Sheet (Questionnaire). The use of questionnaire instruments in research and development of e-book 8 learning media by researchers is used to determine the feasibility of products that have been developed. The questionnaire is composed of two types of questionnaires, namely a questionnaire for product assessment by material experts and an assessment by media experts. Assessment criteria for each questionnaire.

Data from questionnaires for product feasibility tests (product validation) and analyzed using descriptive statistical analysis techniques. The analysis intended by descriptive statistical techniques, namely the researcher clearly illustrates the acquisition of data. Then the results of the analysis are used to revise the learning media products developed by researchers. The researcher explained the results of product development in the form of e-book interactive learning media, testing the level of validity and feasibility of the product to be implemented in a learning on continental food knowledge subjects. Analyzing data from questionnaires, do the following steps:

1. The questionnaire that has been filled out by the respondent is checked for completeness.
2. Quantifying statements by giving scores according to pre-determined weights.
3. Make data tabulation
4. Calculate the percentage of each sub variable with the formula as follows:

\[
\text{Percentage} = \left( \frac{\text{Amount of Earnings Score}}{\text{Maximum Score Amount}} \right) \times 100\%
\]
From the percentage obtained then transformed into the following table:

<table>
<thead>
<tr>
<th>No</th>
<th>Criteria</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Very Good</td>
<td>81% - 100%</td>
</tr>
<tr>
<td>2.</td>
<td>Good</td>
<td>61% - 80%</td>
</tr>
<tr>
<td>3.</td>
<td>Enough</td>
<td>41% - 60%</td>
</tr>
<tr>
<td>4.</td>
<td>Not Good</td>
<td>21% - 40%</td>
</tr>
<tr>
<td>5.</td>
<td>Very Not Good</td>
<td>0% - 20%</td>
</tr>
</tbody>
</table>

The minimum e-book learning media test data set at the Beauty Education Study Program is 75 so that cosmetology students are said to pass or complete if they have a minimum score of 75.

3 Result and Discussion

Development of e-book learning media on anatomical physiology and beauty material. Development research begins with needs analysis by observing and interviewing lecturer subjects. The activity of identifying needs is done by interviewing lecturers and observations in the learning process. The results of observations and interviews revealed that the limited instructional material is the absence of interactive learning media on anatomical physiology and beauty material so that there is a need for media as teaching materials and student learning media for cosmetology. In the learning process, lecturers in delivering material are not maximal, because of the limited media. Whereas according to cosmetology students, there are still difficulties in learning anatomical physiology and beauty material. The interactive media e-book on physiology and beauty anatomy contains material about starting from understanding, function, classification, and equipped with practice tests regarding anatomical physiology and beauty. If the media is packaged attractively, cosmetology students will be more motivated to learn it, besides that the media can also be used as a learning media that can be used for the teaching and learning process, especially independent learning.

This development research was carried out in a number of stages that Sugiono put forward which were simplified into seven stages, which included the analysis phase of student makeup requirements, product development stage, expert validation stage and revision, small group trial phase, group testing phase and stage large group trials.

On the results of the validation sheet assessed by media experts, media experts gave an 88 rating. 56% that the media is feasible because the display of good images, animations and sounds is good. Then the material expert gives a 90.5% assessment that the media is suitable to be used in the teaching and learning process because the material displayed on the learning media is in accordance with the KKN/I syllabus.

On the results of the questionnaire trials a small group of cosmetology students gave an assessment of 67.7%. The things that affect students’ assessment of makeup on learning media when conducting small class trials are the lack of media from various aspects starting from design, feasibility of contents and packaging of the media itself includes 1) background design that is monotonous and uninteresting so that the writing material on media not clearly visible to cosmetology students, then an interesting and appropriate background improvement is carried out; 2) space or distance between words on the material that is not neat, so that the material on the media looks unbalanced, then needs to be improved on writing material; 3)
backsound not appropriate for learning media because it can interfere with cosmetology students when receiving lessons, then backsounds are replaced in accordance with the media, namely learning; 4) lack of interactive buttons on the media that cause media to be uninteresting and interactive, then add interactive buttons to increase curiosity makeup student; 5) animation that looks plain and usually makes students make up for saturation with media, then there needs to be more varied animations; and 6) writing that is too small and the font causes the writing not to be seen remotely. Therefore it is necessary to improve the first trial according to the deficiencies when carrying out small class trials.

In the medium group trial cosmetology students gave an 80.33% assessment, experienced an increase from previous trials because there had been improvements based on deficiencies when conducting small class trials, but when conducting moderate class trials there were also some disadvantages of learning media namely: a non-uniform background makes some parts of the material cannot be clearly seen by cosmetology students and therefore there needs to be a background improvement, and 2) there is writing in a less neat table so that when students make reading make up the wrong meaning of the material.

Finally, a large group trial was conducted with the results of the evaluation of 90.17%. Based on the results of the student assessment which refers to the assessment as written by Ridwan (2012) the media is feasible to use without revision. When viewed from the student assessment, makeup from the small, medium and large class trials has increased. This is influenced by media improvements both from material and media. Media validation and material validation examine the learning media, then the validator gives an assessment, comments and suggestions are in accordance with the deficiencies during the trial run. Improvements related to aspects in the validation sheet starting from the contents of the material, background use, animation, backsound, use of button buttons, font size, font type, color usage, image quality, clarity of instructions, use of interactive buttons, sound quality and the order of presentation that requires improvement so that the products produced are truly feasible for learning activities based on the assessment of lecturers and cosmetology students.

This is in line with previous research conducted by Resti Nidia Ardiani, a student from State University of Medan, majoring in PKK with the title of developing interactive learning media based on adobe flash cs6 on making and installing krah techniques on blouses in class XI, dressmaking, state SMK 3 Pematang Siantar, test results try the small group 76%, the group test results are 79% and the large group test 90% are feasible in production as learning media and Research Fitria Muslimah entitled development of interactive video learning room service media governance subjects in SMK 1 Sewon shows that the results feasibility assessment by material experts (93.18%) was categorized as very feasible, while the assessment by media experts (94.40%) and assessment by cosmetology students (80.81%) was categorized as appropriate to be used as learning media.

4 Conclusion

Based on the results of research development carried out and the discussion that has been described can be concluded in this research is development of e-book learning media. At this stage it was concluded that the developed e-book learning media belonged to the excellent category with a percentage of the overall media expert value of 88.56% and the overall assessment of the material experts 90.5%, the results of the small group trial 67.7 %, medium
group test results 80.33% and large group test 90.17% have been feasible in production as learning media.

Based on the discussion of the results of the study, the authors show some suggestions for improving and further research. It is expected that teaching and learning processes such as lectures that have been carried out in the learning process are assisted by learning using interactive multimedia-based learning media that can have a positive influence on students’ interests, motivations and learning outcomes in anatomical physiology and beauty.

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References

Factors of Land-Use Change, Case Study: In Kota Juang, Bireuen, Indonesia

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Abstract. The land-use in the city can change after a period of time because of the growing demand for a land. The land-use of Kota Juang began to change in the year of 2001. This case occurs because of the influence of several factors such as urban expansion, topography, accessibility and human growth. This research aims to identify the influence of those factors to the land-use. This study used qualitative method by using descriptive analysis to analyze the impact of the urban expansion, topography, accessibility and human growth to the land-use change in Kota Juang, Bireuen. The results of this study suggest that, in 1990-2000 the land-use of Kota Juang was more dominant for agriculture area, but after the urban expansion in 2000-2017 most of the land in Kota Juang is used for the residential, commercial, government, and public area. The agriculture area in Kota Juang has been reduced up to 33.8%. This study can benefit the community, developers and others in the industry to obtain information on the land-use changes that occur in Kota Juang. The findings can also be used by the government in evaluating the spatial plans in Kota Juang, Bireuen.

Keywords: Accessibility, human growth, land-use, topography, urban expansion.

1 Introduction

The increasing demand for a land continues so indirectly there are some factors that causes the land-use change, such as agricultural land which turns into a residential area, due to the process of developing the suburban area and lack of control in using space [1]. This case is considered reasonable to create a city which has more benefit, but the land-use change should be more structured and regulated to minimize future land problems. The wrong allocation of land-use will result in a bad image of the city [2].

Kota Juang is the capital of Bireuen Regency and the physical development of this city grows more rapidly, this is because the high demand of facilities and infrastructure to provide the traffic service to meet the needs of intensive care treatment at the urban. Most land-use change in Kota Juang is agriculture, changed to develop the city, according to spatial planning development (RTRW) agriculture area located in core Kota Juang has been changed to commercials area, housing and other use. The change urban land-use in Kota Juang are resonable due to this city born in 2005 as capital of Bireuen regency and 1999 Bireuen government start to independet region segregation from Aceh Utara. The population density of Kota Juang is 50.070 people and the urban area is 3.156 ha [3].
Land-use change is an increase in land-use from one side of use to another, followed by a reduction in the type of land-use from one time to the next, or changing the function of a land at different times [2-5]. The change of land-use in a city can be influenced by several factors including topography, accessibility, population growth, and urban expansion [3][6].

The urban expansion is experiencing administrative expansion or formation of new urban regions, which can cause human factors and urban development efforts and urban public facilities [7]. Conditions topography also affect land-use changes caused by separating land-used areas, such as housing areas and agriculture areas. Good land to be developed as a residential area is a relatively sloping land, has a small slope, so it has great development potential. Building mass destiny determine ideally conditions of topography and natural landscape.

Accessibility is the interaction of activities with the transportation system to access public facilities. Accessibility is often associated with distance, time access, and costs. Good accessibility is expected to overcome some mobility barriers, both related to physical mobility, for example, accessing highways, shops, or buildings, schools, cultural centers, industrial, and recreational locations [8].

Population growth factors cause opportunities available work along with the development of a city, causing the increasing population of the city. As a whole, the urban development and changes of land-use are growing dynamically and naturally influenced by human, human needs for shelter, human potential, financial, socio-cultural, and technological.

**Fig.1. Literature review**

Overall based on theoretical studies of these four factors, it will later be analyzed to find out which factors most change land-use.
2 Methodology

2.1 Research Area

This study is located in Kota Juang, Bireuen, on the Sumatera cross highway this city is a transit of trade region aceh because it is at the midpoint of the Aceh economy and easily achieved by other regions. The geographic of Kota Juang, Bireuen has an area 3.156 Ha with 23 villages and population 50710 people (BPS Bireuen). Kota Juang is a sub-distrik in Bireuen Regency and segregation from Jeumpa sub-distrik in 2005 this urban located in core Bireuen as serve of other sub-distrik area such as the activity existence of government, commercial and public services for all sub-distrik region in Bireuen.

According to the government spatial plant (RDTR) only 21 village located in the core urban Kota Juang, Bireuen so that is the study area with boundary area north with Kuala sub-distrik, south with Juli sub-distrik, east with Peusangan sub-distrik and west with Jeumpa sub-distrik. The map of study area is show in Figure 2.

Kota Juang having special character landscape his position transition hill to the beach, and condition of counture moore flat. Other benefits in this city are located national roads, that is westward connection to Banda Aceh, eastward to Medan and southward to Takengon.

2.2 The Method

This study used qualitative method by using observation as the technique for data collection. Observations is see the field situation and recording all observational data. This method aims to find out the truth or facts in the field [8]. This study used descriptive analysis to analyze the influence of factors urban expansion, topography, accesibility and human growth population to the land-use change in Kota Juang, Bireuen.

Data analysis in this research starts at the beginning of data collection until data collection is complete. This study also uses maps land-use maps from the development planning agency (Bappeda) of Bireuen identify the changes of land-use in Kota Juang, Bireuen.
3 Result and Discussion

3.1 Urban Expansion Factor

In period 1990-2000 Kota Juang is sub disrik of Jeumpa under Aceh Utara goverment, this land-use before formation Bireuen Regency dominant of land-use agriculture compared other land-use, the details of period before urban expansion are commercial 130.51Ha (4.6%), housing 935.83Ha (33.20%), agriculture 1638Ha (58.12%), government 8.11Ha (0.28%), public facility 31.6Ha (1.12%), open space 21.4Ha (0.75%), mix used (commercial and housing) 20.91Ha (0.74%), industry 4.31Ha (0.15%), military area 6.06Ha (0.2%) and lake reservoir 21.29ha(0.75%). for more details can be seen in Figure 3.

![Fig. 3. Land-use Kota juang in 1990-2000](image)

Basically land-use in this period was caused by the lack of community activities and the economic activities of the area still held by city of Lhokseumawe which has its own power in the capital Aceh Utara. But as time goes the city of Bireuen born as a developing satelite city and Kota Juang sub-sistrik as capital. In Figure 3 above it appears dominant green means the amount of agricultural land-use is very large before urban expansion occurs.

During 2001-2017 Bireuen start to independent regency it mean out of Aceh Utara government, so this period many land-use change to develop new government area, public facilities and other needs of Bireuen government, Kota Juang has experiencing these changes caused city of capital and core of the city.

The land-use significant change is reduced agriculture and housing goes to widened, based analyst agriculture 24.7 % and land-use housing be 52. 57 % and commercial 13.6 %. The detail wide land-use commercial 383.16Ha (13.6%), housing 1481.68Ha (52.57%), agriculture 684Ha (24.27%), goverment 25.53Ha (0.90%), public fasility 45.6Ha (1.61%), open space 21.4Ha (0.75%), mix used (commercial and housing) 141.12Ha (5.05%), industry
11.64 Ha (0.41%), military area 6.06 Ha (0.2%) and lake reservoir 21.29 Ha (0.75%). Detail map of land-use in Figure 4.

The changes that occur are natural in a new developing city. In Figure 5, agriculturer reduced the agricultural area reduced, housing continues to increasees, from the picture can seen the green creases in yellow, commercial starts to develop spread in the direction of the arteri road ways. Comparison of changes in the use of struggle for agricultural land before the expansion of urban areas. There are two periods, before and after urban expansion (figure 5).

3.2 Topography Factor

The condition topography Kota Juang flat and wavy 0-8% with maximum height above sea level at 197 m a.s.l (figure 6). There are four types of topographic heights at 181.5 m a.s.l agricultural area is land-use dominant, 186.7 m a.s.l are area of housing, commercial, government and mix-use area, 193 m a.s.l are housing and agriculture, are 197 m a.s.l housing, agriculture, and commercials in figure 7.
Futhermore, good topography that is widely used by users at 186.7m a.s.l caused wide plain, however at 181.5m s.a.l start to change agriculture to housing and residential area.

3.3 Accessibility Factor

Accessibility determine ideal or not access to public facilities in Kota Juang, Bireuen. The distribution of public facilities to be achieved spread in the center Kota Juang, Bireuen includes the achievement of several public service facilities, namely health facilities such as hospitals, health center, and clinic in position close access with commercial area and military area. According analysis access to hospital very easy with good road collector without traffic jam, while health center Kota Juang located in housing land-use, it mean very easy to access because located directly in same area (Figure 7 and Table 1).

The Transportation facilities that bus station located in commercial land-use, it is very profitable to archive commercial area, while gas station located close in government, housing and education area.

Public service facilities for open green space are only 0.75% of wide Kota Juang, but acces this place very easy to access located in commercial area, then stadium football located in housing and government area at arteri road ways.

Public facilities of worship Masjid Agung Sultan Bireuen located in commercial and housing area with distance access very easy in arteri road, facilities education such as primary school scattered in every village but middle school and high school located center in one area at artery road (figure 8 and Table 1).
Fig. 8. Accessibility to public facilities Kota Juang

Distribution public facilities Kota Juang so it is very easy to reach from the Kota Juang and regional scale of the Bireuen regency.

Table 1. Distribution Public Facilities

<table>
<thead>
<tr>
<th>Facility</th>
<th>Amount unit</th>
<th>Located in area</th>
<th>Distance</th>
<th>accessibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>4</td>
<td>Commercial and military area</td>
<td>1 km</td>
<td>Easy acces</td>
</tr>
<tr>
<td>Health center</td>
<td>2</td>
<td>Residential area</td>
<td>2 km</td>
<td>Easy acces</td>
</tr>
<tr>
<td>Education</td>
<td>37</td>
<td>Government, commercial and</td>
<td>1 km</td>
<td>Easy acces</td>
</tr>
<tr>
<td>SD/SMP/SMA</td>
<td>1</td>
<td>Residential area</td>
<td>1.5 km</td>
<td>Easy acces</td>
</tr>
<tr>
<td>University</td>
<td>1</td>
<td>Commercial and residential area</td>
<td>2.5 km</td>
<td>Easy acces</td>
</tr>
<tr>
<td>Mosque</td>
<td>30</td>
<td>Commercial and residential area</td>
<td>1 km</td>
<td>Easy acces</td>
</tr>
<tr>
<td>Bus Station</td>
<td>1</td>
<td>Commercial</td>
<td>1 km</td>
<td>Easy acces</td>
</tr>
<tr>
<td>Gas station</td>
<td>2</td>
<td>Government, commercial and</td>
<td>800 m</td>
<td>Easy acces</td>
</tr>
</tbody>
</table>

Since a long time ago it was a trade transportation link to Takengon, Aceh Tengah Regency. Produce from Takengon such as coffee and vegetables transit in Kota Juang Bireuen and transported to market Banda Aceh and Medan, and caused transportation to takengon was mountain road conditions also traders waiting in Kota Juang, Bireuen for pick up after being taken down from Takengon. so directly the city of Kota Juang Bireuen important role for the economic Aceh region, with the advantage of the three lane golden triangle economies of Aceh [9]Detail map of regional accessibility in Figure 9.
3.4 Human growth factor

The factors of human growth is birth increase population in Kota Juang occurs because influence migration entering and high birth rates ratio compared to death rates. The increase of urban population growth in Kota Juang is caused by economic value in center city to trade and other beneficial interests as evidenced by changes in land-use, the wider the area is built than the area that is not built.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>41900</td>
<td>43399</td>
<td>43519</td>
<td>46528</td>
<td>47419</td>
<td>49758</td>
<td>50710</td>
</tr>
</tbody>
</table>

Fig. 9. Regional accessibility of Kota juang

Table 2. Population growth Kota Juang, Bireuen

![Human growth population at year in Kota Juang](#)

Fig. 10. Increasing population growth in the last 10 years
The analysis of population growth from 2005 to 2017 experienced an increase of 21% (fig. 11). Easiness in the community economy has an increase in the migration population, because coming to Kota Juang, Bireuen is more profitable. According to BPS Bireuen in 2016 birth rate 459 people and death 204 with migration in 2016 there are 451 people.

Influence of population growth on Kota Juang affected economic activity in core city, there is change land-use housing to commercial and housing to mix used (figure 12).
4 Conclusion

Four factors namely urban expansion, topography accessibility, and human growth influence to change, according analyst finding urban expansion and human growth is the most factor change urban land-use land-use Kota Juang, Bireuen. Recommendation to Bireuen government has need to plan new area in other sub-distrik develop agriculture caused in Kota Juang agriculture decreasing and control management related urban land-use change. This study can benefit the community, developers and others in the industry to obtain information on the land-use changes that occur in Kota Juang, Bireuen. The findings can also be used by the government in evaluating the spatial plans in Kota Juang, Bireuen.

References

Results of Basic Learning Pattern’s Learned by Memorization Learning Model

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Abstract. This study aims to find out the basic learning outcomes of the pattern learned by memorization learning model for students in Vocational High School 3 Pematangsiantar as a population, with the instrument using the learning outcomes test, then analyzed by t test. The results of the analysis showed that the learning outcomes learned by conventional learning showed the average results of (57.03), and the learning outcomes learned using the memorization learning model (72.03). Data distribution of learning outcomes with conventional learning is normally distributed where 0.151 <0.157 and student learning outcomes data with learning memorization learning models are normally distributed where 0.079 <0.151 and homogeneous variance data for f count 1.71 <f table 1.82. It was concluded that learning outcomes with memorization learning models were better than conventional learning where the test results showed t -4.761 <t table 1.67. So it proved that there was no effect of student learning outcomes that were learned using memorization learning models with students who were taught using conventional learning. This means that the use of learning memorization learning models can be used as alternative learning in schools.

Keywords: Learning, outcomes, pattern, memorization, learning model.

1 Introduction

Education that is able to support development in the future is education that is able to develop the potential of students, so that those concerned are able to face and solve the problems of life they face. Education is also one of the most important human needs in living his life, without human education it will be difficult to develop and become backward, absolute education must be continuously carried out continuously because education does not know time and is a process that continues throughout human life, both through formal and independent channels. The learning process is an educational process in which students develop knowledge, thinking skills and psychomotor skills through interaction with learning resources designed in the syllabus and learning design in the form of learning activities. Students do learning activities by observing, asking questions, gathering information, associating or analyzing, and communicating what has been found in the analysis activity. The direct learning process produces knowledge and skills or what is called the instructional effect.

Vocational High School students, are potential human resources who have the ability to live independently with the skills and mastery of knowledge from the programs chosen and owned to be able to directly apply the skills in available jobs. Vocational High Schools as part of secondary education have the following objectives: 1) Preparing students to enter the workforce and develop professional attitudes; 2) Preparing students to be able to choose a
career, be able to be competent and develop themselves; 3) Prepare a professional workforce in the future, 4) Preparing graduates to become productive, adaptive and creative citizens.

Currently the world of education is faced with a difficult situation where graduates are not ready to use as expressed, that the closer to the world of globalization, especially information technology, the more it is deemed necessary to comprehensively improve education. The weakness of the resources of Vocational High School graduates is largely due to the lack of mastery of competencies and sub-competencies given in Vocational High Schools. The achievement of educational goals and basic competency patterns focuses on students' knowledge in understanding the basic pattern of fashion clothing including body patterns, skirt patterns and arm patterns, construction patterns, finished patterns, changing patterns according to design. The low learning outcomes occur because learning tends to be conventional, namely the teacher-oriented learning approach, so that during the learning process the students are less active, the teacher still draws a pattern on the blackboard, while the students take the drawing pattern, by paying attention to the teacher.

The teacher's role in class management is especially important in creating an attractive learning atmosphere, because in principle, the teacher holds two tasks as well as the main problem, namely teaching and classroom management. Conversely, management problems are related to efforts to create and maintain learning conditions so that the learning process can take place effectively and efficiently in order to achieve learning goals [1]. The ability of students to ask and express ideas is very low, so the teacher asks students to ask questions that are not yet understood. Joyce & Weil write a learning model is a plan or pattern that is used as a guide in planning learning or tutorial learning and to determine learning tools and direct in designing learning to help students achieve learning outcomes [2].

Memorizing is an active effort to enter information into the brain. Lorayne (2008) said that there are people who can remember information quickly, but cannot maintain it for a long time. This is due to the lack of empowering memory capabilities. Furthermore, Joyce & Weil (2009) suggested that the learning model has elements: 1) Syntagmatic; 2) Social System; 3) Reaction Principle; 4) Support System; 5) Instructional Impact and Companion Impact. The learning model of memorization is believed to be able to improve the results of basic learning patterns because it is supported by several support systems in the form of pictures, concrete assistance, films and other audiovisual material useful especially to increase sensory wealth in the associations created which can facilitate students' learning.

Basically conventional learning that is known to often use the lecture method, tends to be oriented towards the material listed in the curriculum and textbooks, and rarely relate the material discussed with the real problems that exist in everyday life. Syahrul (2013) explained that conventional learning is characterized by the teacher teaching more about concepts not competency, the goal is that students know something not able to do something and when the learning process students listen more [3]. When the teacher explains the material, students tend to be quiet and listen to what is explained by the teacher, students do not argue if there are things that want to be asked related to the material in the book. However, it is not enough to provide variation in teaching and learning activities in the classroom. Because there are still a number of teaching skills that can be applied by teachers in learning and are the basis of the skills or knowledge for teachers in teaching that must be possessed in addition to knowledge of methods, strategies, and other learning models. According to Kholik (2011) the advantages of conventional learning are: a) various information that is not easily found elsewhere, b) convey information quickly, c) generate interest in information, d) teach students the best way to learn by listening, e) Easy used in the teaching and learning process, while his friendship is: a) not all students have a way to learn by listening, b) often there is difficulty in keeping
students interested in what is learned, c) students do not know what their goals are learning on that day, d) emphasis is often only on the completion of tasks, e) its absorption is low and quickly lost due to memorization [4]. In connection with this matter Ampera (2017), writes that utilizing learning models that are in accordance with the material can improve learning outcomes, and Ampera [5] exposure also explains that a teacher should be able to utilize learning strategies that are appropriate to the needs of the student's skills. Conventional learning is still carried out on the assumption that a knowledge can be transferred completely from the teacher's mind to the student. Conventional teaching methods have so far emphasized the task of the teacher to give instructions or lectures during the learning process, while students only receive passive learning.

The Memorize Learning model (information processing) has advantages and effectiveness to be used in learning, because the information processing model emphasizes how one thinks to be able to understand the concept of facts and can apply the concept to produce simple technological work related to human needs. The most important factor that influences learning is what students have known, so that the concepts that exist in the cognitive structure of students are very important in their existence so that students can learn correctly. To implement this model is to know how the brain works. By learning and knowing the work of the brain, we understand how to memorize according to the way the brain works, so memorizing becomes very easy, the spirit of memorization also increases. Whatever material form is memorized with old memories is not a momentary memory. The most effective form of personal strength actually comes from competencies based on knowledge; it is important to shape feelings that are getting better and lead us to success.

Erwin (2012) mentions there are three basic things that become the pillars of memorizing magic memory, namely: 1) Imagination is the ability to imagine something in the mind, its form in the form of visual images of the brain, 2) Association is the ability to connect something with others in mind, and color will become one of the reinforcing factors of the association, 3) Location is the ability of the brain to remember an object that has an image and association, and its condition is in a special location so it is easy to be recalled when needed. Memory for learning and daily life is supported by two basic activities, namely memorizing and recalling activities. Memorization is an active effort to enter information into the brain, whereas remembering is an active effort to release information from the brain. Meanwhile, the learning model includes four stages: clarifying dimensions, developing relationships, enhancing sensory images, and making repetitions. These stages are based on the principle of attention and techniques to improve memory (the techniques for enhancing recall). A memorization model specifically designed to increase the capacity of students to store and obtain information.

![Fig. 1. Cycle of the Memorization Learning Model](image)
This model educates the sensibility of intellectual power, increases awareness of the ability to master unknown material, as well as thinking skills and attention to the environment. The second result is an increase in the capacity of depicting and realizing creative forms of thinking that are part of more convergent and information-oriented learning.

2 Methodology

This research is a quasi-experimental study with a population of 96 students, with the provision of sampling using simple random sampling technique. This study involved 2 classes that were given different treatments, namely before the treatment, the sample of this study was grouped into 2 groups, namely the memorization learning model class and the control class taught with conventional learning. Before the treatment the students were given the same material in the time of delivery and the same teacher before the treatment, and after the treatment, the post test was given to determine the development of students' knowledge after the treatment. As for the steps of research memorization learning as shown in Figure 2 below.

Fig.2. Research design of Memorization Learning Model

The research data is in the form of learning outcomes after learning treatment. Instrument testing was conducted to obtain tools in collecting valid and reliable data, then the valid instruments and the reliable were used to capture changes from students. To find out the validity of the learning outcomes test, the bivariate point correlation formula is used. Furthermore, the r count price is consulted with the r count price at a significant level of 5%. If \( r \) \( \text{count} > r \) \( \text{table} \), the test item is valid. The testing criteria are: accept \( H_0 \) if \( t < t_{1 - \alpha} \) and \( H_0 \) are rejected if \( t \) has other prices. If \( r \) \( \text{count} > r \) \( \text{table} \), the test item is valid. The testing criteria are: accept \( H_0 \) if \( t < t_{1 - \alpha} \) and \( H_0 \) are rejected if \( t \) has other prices. If the data analysis shows that \( t \geq t_{1 - \alpha} \) then the \( H_a \) hypothesis is accepted that there is the influence of memorization learning model on learning outcomes.
3 Result and Discussion

The study was conducted at the Vocational High School by using the quasi-expansive method, in the experiment class using memorization learning models, while in the control class with conventional learning. Based on learning outcomes data using conventional learning, the average values (57.03) and standard deviations (14.16) were obtained with the highest score 85 and the lowest value 35. Frequency distribution of learning outcomes using conventional learning is seen in Table 1 below this.

<table>
<thead>
<tr>
<th>Class</th>
<th>Interval</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35 – 43</td>
<td>5</td>
<td>15.6</td>
</tr>
<tr>
<td>2</td>
<td>44 – 52</td>
<td>8</td>
<td>25.0</td>
</tr>
<tr>
<td>3</td>
<td>53 – 61</td>
<td>9</td>
<td>28.1</td>
</tr>
<tr>
<td>4</td>
<td>62 – 70</td>
<td>5</td>
<td>15.6</td>
</tr>
<tr>
<td>5</td>
<td>71 – 79</td>
<td>2</td>
<td>6.3</td>
</tr>
<tr>
<td>6</td>
<td>80 – 88</td>
<td>3</td>
<td>9.4</td>
</tr>
<tr>
<td>Amount</td>
<td></td>
<td>32</td>
<td>100</td>
</tr>
</tbody>
</table>

Data on the basic learning outcomes of the pattern were given memorization learning model, obtained on average (72.03) and standard deviation (10.82) with the highest score (90) and the lowest value (50). This memorization learning model can guide students to be actively involved in the learning process by discussing it. Students' direct involvement in the learning process makes the learning process that is passed can be more meaningful, because it is not only focused on listening to the teacher's explanation.

This memorization learning model is able to guide students to be actively involved in the learning process. The memorization learning model can direct students to be actively involved in the basic learning process patterns can discuss, and involve students directly in learning activities so that learning becomes more meaningful, because it is not only focused on listening to the teacher's explanation. Learning also makes students better show interaction between friends, because based on the observations of researchers during the learning process, the existence of this discussion process makes two-way communication happen.

In addition to good interaction, learning is also more fun because in phase 3, it is to improve students' ability to work in groups, discuss and do assignments, besides that students eagerly express their imagination in a picture of the types of fashion patterns. Although at the first meeting students were still lacking in sensory improvement, but at the second meeting, the imagination of students' images was much better and creative. This is based on interviews with 3 students after the learning process which states that with the activities carried out while doing group work in drawing the basic pattern of clothing, making students more excited because there is activity carried out. But this increase is not better than that obtained by students in the experimental class. This is because conventional learning has not been able to make students active in learning, student interest only appears when the teacher displays pictures of examples of body patterns and pattern descriptions with the help of power point media. Students listen more to the explanation of the material from the teacher, so that it is less constructive in understanding the drawing of patterns and changing the basic pattern according to the model, as a result the learning seems to be passive, because students tend to listen and record. Hearing and noting activities alone are not necessarily good for helping to
memorize and understand, even making learning tend to be boring which eventually leads to indifference to learning.

**Table 2. Distribution of Learning Outcomes Basic patterns given Model of Learning Memorization Learning**

<table>
<thead>
<tr>
<th>Class</th>
<th>Interval</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50 – 56</td>
<td>3</td>
<td>9.4</td>
</tr>
<tr>
<td>2</td>
<td>57 – 63</td>
<td>4</td>
<td>12.5</td>
</tr>
<tr>
<td>3</td>
<td>64 – 70</td>
<td>6</td>
<td>18.8</td>
</tr>
<tr>
<td>4</td>
<td>71 – 77</td>
<td>10</td>
<td>31.3</td>
</tr>
<tr>
<td>5</td>
<td>78 – 84</td>
<td>5</td>
<td>15.6</td>
</tr>
<tr>
<td>6</td>
<td>85 – 91</td>
<td>4</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount</td>
<td>32</td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

Data on trend level learning outcomes Basic Patterns with conventional learning are seen in table 3 below.

**Table 3. Trend Level of Basic Pattern Learning Outcomes with conventional learning**

<table>
<thead>
<tr>
<th>Interval class</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>0</td>
<td>0.0</td>
<td>Very Good</td>
</tr>
<tr>
<td>80-89</td>
<td>3</td>
<td>9.4</td>
<td>Good</td>
</tr>
<tr>
<td>70-79</td>
<td>6</td>
<td>18.8</td>
<td>Enough</td>
</tr>
<tr>
<td>&lt;70</td>
<td>23</td>
<td>71.9</td>
<td>Less</td>
</tr>
</tbody>
</table>

Based on Table 3 above, out of 32 samples there were 3 (9.4%) getting good learning outcomes, 6 (18.8%) had enough learning, and 23 (71.9%) had less learning outcomes.

**Table 4. Trend Level of Basic Pattern Learning Outcomes with Memorization Learning Model**

<table>
<thead>
<tr>
<th>Interval class</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>3</td>
<td>9.4</td>
<td>Very Good</td>
</tr>
<tr>
<td>80-89</td>
<td>6</td>
<td>18.8</td>
<td>Good</td>
</tr>
<tr>
<td>70-79</td>
<td>13</td>
<td>40.6</td>
<td>Enough</td>
</tr>
<tr>
<td>&lt;70</td>
<td>10</td>
<td>31.3</td>
<td>Less</td>
</tr>
</tbody>
</table>

Based on Table 4 it is explained that out of 32 samples there were 3 (9.4%) obtained very good learning outcomes, 6 (18.8%) got good learning outcomes, 13 people (40.6%) got enough learning outcomes and 10 (31.3%) learning outcomes are lacking categories. Exposure to the average treatment value in the experimental class and control class is shown in table 1 below.
Table 5. Average Values of 1st, 2nd and 3rd Meeting Students of Experiment Class and control class

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Average</th>
<th>Experimental class</th>
<th>Control class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning 1</td>
<td>90.25</td>
<td>71.90</td>
<td></td>
</tr>
<tr>
<td>Learning 2</td>
<td>91.50</td>
<td>79.00</td>
<td></td>
</tr>
<tr>
<td>Learning 3</td>
<td>91.75</td>
<td>82.00</td>
<td></td>
</tr>
</tbody>
</table>

From the learning outcomes data taught with memorization learning model is better than the learning outcomes taught with conventional learning. Therefore, it is expected that teachers need to rely on memorization learning models in Basic Pattern learning, because by using memorization learning models will train students to be more creative and faster in memorizing something related to understanding the pattern of fashion patterns, namely about fashion patterns, arm patterns, skirt pattern, and change the pattern according to the model.

Table 6. Hypothesis Test

<table>
<thead>
<tr>
<th>Data</th>
<th>Class</th>
<th>Average</th>
<th>Standard Deviation</th>
<th>t_{count}</th>
<th>t_{table}</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Pattern Learning Outcomes</td>
<td>Control class</td>
<td>57.03</td>
<td>14.16</td>
<td></td>
<td></td>
<td>H_a accepted</td>
</tr>
<tr>
<td>Basic Pattern Learning Outcomes</td>
<td>Experimental class</td>
<td>72.03</td>
<td>10.82</td>
<td>-1.67</td>
<td>1.67</td>
<td>H_a accepted</td>
</tr>
</tbody>
</table>

The results of the calculation of the average value of basic learning outcomes in conventional learning patterns are (57.03) with standard deviations (14.16). While the average value of learning outcomes given memorization learning model is (72.03) with standard deviation (10.82). From the average results, a t-test analysis was conducted between the learning outcomes in both classes. The results of the t test calculation obtained the price of t_{count} (-4.761). When compared with t_{table} at df (62) that is equal to (1.67). Then the value t_{count} < t_{table} or (-4.761 < 1.67), which means that the alternative Hypothesis (H_a) is accepted. Thus, the hypothesis which states that there is an influence of memorization learning model on the proven learning outcomes. Then it was concluded that learning outcomes that were given memorization learning models were higher than learning outcomes using conventional learning. The memorization learning model is a model that is directed to develop students' ability to absorb and integrate information so that they can remember information that has been received and recalled at the time it is needed.

Then the writings of Khamees, Khalid [6] and Klemm [7], explained that learning with memorization learning models can increase learning motivation in memorizing in students with low cognitive, it is important to know the teacher to emphasize the importance of understanding, but not ignoring skills memorize. While education theory includes attributes such as insight, creativity, inquiry learning, and self-expression, and leads to bias and lack of respect for the role of memory in learning. Students cannot apply what they understand if they don't remember it, and good memories expand cognitive abilities.

Furthermore Michael A. Conditt, Francesca Gandolfo, and Ferdinando A. Mussa-Ivaldi wrote Taken together, the articles remind us that individual cognition, while not only in learning factors, is a central determining feature of learning [8]. However, we must work to further develop the present partial theory of conceptual change to fill in the missing cognitive description.
core of the present shell. This memorization model is useful for balancing the functions of both the brain, the left brain and the right brain in processing the information obtained. The left brain is a brain that is logical, successive, and partial and tends to process information one by one, while the right brain thinks randomly, holistically and creatively in receiving and storing information.

Often students find it difficult to memorize because in learning students often use half of the ability of the left brain only and usually students must think sequentially and logically even though the right brain should also be used because the right brain is very helpful in the process of memorizing fast, and thinking creatively. With the balance of using the left brain and right brain together can improve the effectiveness of learning. So by using memorization learning models everything related to memorization will not be difficult and becomes a very pleasant thing. The use of the Memorization model of basic learning patterns is expected to make students more creative to improve memory power and make the material of fashion patterns a fun thing and not a boring thing anymore. If students already have an assumption that learning is a fun thing, it is hoped that this will improve student achievement and learning outcomes.

4 Conclusion

The results obtained from the results of data analysis and testing hypotheses can be concluded as follows: First, learning outcomes taught using conventional learning tend to be less with the average (57.03). Second, learning outcomes given memorization learning models tend to be quite average (71.48). Third, there is a significant influence between memorization learning model on the basic learning outcomes of the pattern, so it can be concluded that the learning outcomes Basic patterns given memorization learning model are better than learning outcomes that use conventional learning. Based on the results of the study and testing the hypothesis that by applying memorization learning models can improve student learning outcomes and better than student learning outcomes taught with conventional learning.

References

The Effectiveness of Reality Counseling Approach to Reinforce Responsibility Character on Students Who Has An Interdependence Cultural Background

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Abstract. The responsibility character in era of industrial revolution 4.0 is very crucial owned by students, because of this responsibility will appear trust, fluency, and an objective attainment. Not all students have enough responsibility character, so its reinforcement is needed. The responsibility character reinforcement was conducted on the variety of ways, in education world such as through counseling by using reality counseling approach. Therapy in reality counseling aims at facilitating client to attain mature autonomy indicated by his behavioral evaluation capacity rationally and realistically as well as taking responsibility its problem-solving consequence. The responsibility character reference within student self is influenced by culture that makes background it, that is why, cultural factor should be involved within reality counseling. Students dominantly orienting independent culture placed on responsibility concept on the balance between “right and obligation”, while students dominantly orienting on interdependence culture primarily place on “social relation obligation”.

Keywords: Effectiveness, reality counseling, responsibility character, interdependence, students.

1 Introduction

The power of character cannot be changed by other force, such as economic strength. While good character will support and manifest strong economic. Character can be meant holistically and deeply by its kind, such as characters of honest, caring, independent, responsibility. Responsibility is one of the most important character owned by every individual within all daily life aspectand covers action, feeling, and thought. [1] mentioned this character component was considered as moral acting, moral feeling, moral knowing. Individual was said owning good character when he/she fulfilled three-character elements. Character is the attaching attribute in self human daily life, that is why, character is classic and dynamic. Consequenceof dynamic character attribute either at the level of individual, group, community or people, would be needed reinforcement so good character can be maintained and developed as well as bad character could be changed to be good character.

Character at the individual level can extend, for instance becoming national character. In Indonesia, the national character formation had been doing since Indonesia proclaimed their independence and the government has currently been making it to be national program underlined by rule of republic president of Indonesia Number 87 Year 2017 on the character education reinforcement. The character education reinforcement was conducted with primarily
judgment that Indonesian as cultured peoples is nation that respect noble character, glorious values, wisdom, and mind [2], via reinforcement of religious, honest, tolerance, discipline, working hard, creative, independence, democratic, curiosity, spirit of nationality, birthplace, respect of achievement, communicative, peaceful love, literacy, environment caring, social care, and responsibility [2]. Those values were in relevance to values of Indonesia education objectives implied in Indonesia Republic Laws Number 20 Year 2003 [3].

The character education reinforcement either at the level of individual, group, community, or people, is collaborative responsibility among family, education unit, community, nation, that conducted in the milieu of informal, formal, non-formal. Thus, every individual of Indonesian peoples are expected to take responsibility to manifest Indonesian people’s strong character. The character behavior happened in Indonesia could be observed from the happened events in daily life activities. This later decade, bad character behavior had always been happened in the youngsters, university students, adults, even children. This was happened not only in the milieu of work place, business, politic, but also in the milieu of government, education even more that that penetrating and damaging family life.

Viewed from the kind of bad or weak character, the happened things are not often honest characters (such as cheating, plagiarism, corruption, falsifying reports), ignoring other people’s right (such as ignoring feet walkers right, damaging public facilitations) less of responsibility (such as avoiding from obligation to pay tax, no paying debt, absence in school, absence in working, hit and run). The other bad character behaviors such as robbing, doing violence in home, doing torturing, trafficking in, doing abortion, killing case, drugs user and circulator. If those bad characters are compared with bad character in later eras, its frequency is increasing high and has used more sophisticated and dangerous modus. In term of drugs crime, Indonesia currently considers their nation in “drugs danger/crisis” as this was displayed in some social media displaying and communities’ words in either daily conversationor in scientific meetings.

Based on the elaboration written above, showed that Indonesia government nationally must and has been doing serious completing process in controlling bad characters. This nationally effort is expected to become state of Indonesia republic to be one of world welfare nation. In this significant moment, namely international seminar moment in subtheme “Multicultural Counseling”, theme “The Science Education on Industrial Revolution 4.0”, writer provided writing contribution that applied counseling approach and including cultural factor, with topic: The Effectiveness of Reality counseling approach to enforce responsibility character to students who has interdependence cultural background”. Focused on students as subjects, by reminding that students are intellectual community that will lead and/or nation existence doer. This role required students having higher responsibility The power of character cannot be changed by other force, such as economic strength. While good character will support and manifest strong economic. Character can be meant holistically and deeply by its kind, such as characters of honest, caring, independent, responsibility. Responsibility is one of the most important character owned by every individual within all daily life aspect and covers action, feeling, and thought. [1] mentioned this character component was considered as moral acting, moral feeling, moral knowing. Individual was said owning good character when he/she fulfilled three-character elements. Character is the attaching attribute in self human daily life, that is why, character is classic and dynamic. Consequence of dynamic character attribute either at the level of individual, group, community or people, would be needed reinforcement so good character can be maintained and developed as well as bad character could be changed to be good character.
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2 Methodology

KBBI [4] wrote the meaning and characteristics of character as follows: Character is “individual’s unique attribute that distinguish him/her from the other person; character;
attribute; behavior; aptitude”. Characteristic is “to own unique attribute in relevant to particularly character; to own particularly uniqueness…. In English, character was written “char-ac-ter”, interpreted as: “The combination of qualities distinguishing any person or class of persons; any distinctive mark or trait, or such marks or traits collectively, belonging to any person, class, or race; the individuality which is the product of nature, habits, and environment” [5]. The citation as written above generally showed that character indicates the existence of the owned unique features, which distinguish from others.

3 Result and Discussion

3.1 Meaning and Component of Character (Responsibility)

KBBI [4] wrote the meaning and characteristics of character as follows: Character is “individual’s unique attribute that distinguish him/her from the other person; character; attribute; behavior; aptitude”. Characteristic is “to own unique attribute in relevant to particularly character; to own particularly uniqueness…. In English, character was written “char-ac-ter”, interpreted as: “The combination of qualities distinguishing any person or class of persons; any distinctive mark or trait, or such marks or traits collectively, belonging to any person, class, or race; the individuality which is the product of nature, habits, and environment” [5]. The citation as written above generally showed that character indicates the existence of the owned unique features, which distinguish from others.

According to the meaning of character [6]; [7] proposed the meaning of character at the individual level, namely “character is an individual characteristic integration, which distinguish the individual from others in adapting himself to the environment”. “Character is good unique values (knowing kindness value, wish to do kind, real to live well and positively affect to environment) that internalizes in self and implements in behavior [8]. “Character is the group of individual or individual’s unique feature that imply value, capacity, moral capacity, and rigidity in facing the difficulties and challenges”, while character at the national level, is “quality of unique and good nation collective behavior reflected in awareness, insight, feeling, wish, and civilized behavior as a result of thinking processing, heart processing, feeling and wish processing, as well as someone or group of people’s physical exercise” [8]. Some character definitions as noted above showed briefly that character is the attaching unique attribute, to someone/group/society/nation that imply the internalized values and attributes and determine adjustment toward environment.

Character owns variety of kinds, such as character of honest, tolerance, interest to science, independence, responsible. What is meant with character of responsibility is “the condition of obligation to do everything (if happened anything, then it can be demanded, blamed, brought to court…) [4]. The International [5] proposed the meaning of “re-spon-si-bil-i-ty”, like as “The state on being responsible or accountable”. Departure from the meanings of character and responsibility as written above, it can be formulated that what is purposed with character of responsibility is the unique attribute owned by someone/group/society/nation, about behavior, thinking, feeling to be responsible/responsible thing. This responsibility implied consequence to be able to be brought to court or asked if not to be done. The responsibility character at students means that it is burdened to themselves.

The character has dimensions of good and bad or positive and negative ones. In related to good character, a Greek philosopher, his name, Aristotle defined “good character as the life of right conduct-right conduct in relation to other persons and in relation to oneself.”) (“good
character as the life of right conduct—right conduct in relation to other persons and in relation to oneself”). As discussed earlier, character consisted of three components (namely moral knowing, moral feeling, moral acting); those three components function holistically, performs in individual’s behavior. If they are applied to responsibility character, then they are meant or told to be able to take responsibility in moral knowing, moral feeling, and moral actions.

Each character components were explained by [1] [9] as follows: moral knowing consisted of 1) moral awareness, namely ability to evaluate good/bad, right/wrong; 2) knowing moral values, namely ability for developed moral values and ability to apply them; 3) Perspective taking, namely ability to other people’s perspective taking, looking at the situation as it is, imagining how they will think, response, and feel the existing problem; 4) Moral reasoning, namely reasoning about reason used in determining good/bad or right/wrong; 5) Decision making; 6) Self-knowledge, namely knowledge about moral weakness and strength of himself/herself. Moral feeling covers: conscience, namely commitment to do in accordance with known; 2) Self-esteem, namely evaluating self and others valuable in order to facilitate the appearance of good character, for example self-esteem based on the values of responsibility, honesty, fairness; 3) Empathy, is ability to turn out to be others like the other people’s thinking or feeling; 4) Loving the good, this encourages individual to do something good as well; 5) Self-control to variety of feelings such as angry feeling, sad, lazy, improper; 6) humility in the self-placement. Moral action covers: 1) Competence (competent to change moral feeling and knowledge into the effective moral action); 2) Wish to do something come true; 3) habit to do something good without feeling the existence of pressure.

3.2 Reality Counseling Approach

3.2.1 Definition, Basic concept, Principle, and Reality Counseling Characteristic

Counseling is a professional relationship between counselor and client for client’s problem-solving goal. The helping implementation in counseling is told with other term, such as therapy. There are several theories within counseling and therapy, namely Psychoanalytic Therapy, Adlerian Therapy, Person-Centered Counseling, Gestalt Therapy, Transactional Analysis, Behavior Counseling, Racional-Emotive Therapy, Trait and Factor Counseling, Reality Therapy [10].

Reality therapy was developed by William Glasser, this therapy was popular among counselors since 1960. Reality therapy can be applied within group and individual counseling, in mental health, society agents, and schools. The popularity of reality therapy was based on a number of positive attributes, namely easy to understand, non-technical, based on common sense, orientation to product and successful, focused on problem, and efficient in time, resources, and effort. That is why, reality therapy could be studied and applied broadly, more teaching process than therapeutic process, more preventive method than preservative method [11].

There are several important basic concepts to understand in the reality therapy, namely 1) Basic human needs (every individual had basic needs that requires to fulfill); 2) Identity (individual’s way to look at himself as human relating to other people, as failed or successful person; 3) Responsibility, (able to response in behavior is reality therapy objective); 4) Need fulfillment (individual cannot response in behavior when he failed to learn or when he lost his ability to fulfill his needs; 5) Current behavior, reality therapy relates to current behavior, because counselor is unable to change client’s behaviors in the last time); 6) Behavior versus feelings, emotions, and attitudes(reality therapy focused on the behavior more than emotions, because only behavior can be changed. Controlling client’s behavior is practically easier than
controlling feelings, emotions, and attitudes of theirs); 7) Involvement, reality therapy considers accountable involvement and personally, that efforts to help as a main skill; 8) Alternatives (principle task of reality therapy is to produce much more possible alternatives; 9) Growth force (reality therapy builds individual feeling satisfied and happy, able to response and to own good interpersonal relationships; 10) Learning (reality therapy considered that learning was happened through life and this was central concept of reality therapy) [12]. In other part, Gilliland (1984) proposed seven principles of reality therapy applications, as follows: 1) Becoming personally involved with the client, focusing on the clients present behavior rather than on feelings and on present time rather than past; 2) Helping the client evaluate and make a value judgment about his or her own behavior; 3) Assisting the client in planning responsible behavior; 4) Helping the client to make decisions and commitments to responsible action steps; 5) Accepting no excuses when the client does not perform or fulfill the plan; 6) Elimination of punishment for the clients failures but allowing reasonable consequences to occur; 7) Never give up. While key strategy to help client is “involvement” between therapist and client. The Reality therapy strategies were completely: 1) Involvement; 2) Keeping in the here and now; 3) Living the reality experience; 4) Being positive; 5) Responding to the unhappiness of clients; 6) Looking at the whole picture; 7) Using humor; Confronting clients; 8) Dealing with conscious thinking; 9) Helping clients understanding and accept themselves; 10) Planning responsible behaviors [10]. There were eight reality therapy characteristics, namely 1) rejecting psychological diagnosis of mental disease, because of reality therapy views, mental disease is not due to last time, but form of unaccountable behavior; 2) Focusing on current behavior, not to the past; 3) emphasizing value judgment building client’s awareness that client will not obtain anything they wish when acting destructively; 4) Not to emphasize transference like to psychoanalytic approach. In reality therapy, client was realized so he was not involved in repetition in the past, but here and now; 5) Refer to consciousness aspect, not unconsciousness; 6) Deleting concept of punishment application, but counselor facilitated client feeling the genuine consequence of his behavior; 7) emphasizing client’s responsibility, this was core of reality therapy [11]; [12].

3.2.2 Human Personality Dynamic in View of Reality Therapy

In view of reality counseling/therapy, human personality dynamic was determined by psychological and physical basic needs, the both form success identity or contrarily failing identity. To obtain success identity, individual has to take responsibility and weave valuable interpersonal relationship with his environment. But not all individual really are able to carry on responsibility and ready to weave valuable interpersonal relationship, this caused problem for individual (Glasser in [11]) as proposed by Lubis [12] told that emotional disturbance or mental diseasewerepersons who reject world reality like in norms, law, and social; the rejection time to appeared problem behavior mentioned with failure identity (versus success identity), signed by isolation, self-rejection and irrational, rigid behavior, less of objectivity, less of responsibility, less of self-confidence, rejecting reality.

3.2.3 The Role and Objective of Reality Counseling

Reality counseling in essence contradicted the other counseling approach treating client like a sick individual. Reality counseling played counselor role as a teacher creating conducive condition, teaching and give an example, as well as helping client in order to be able to evaluate his behavior realistically, and accepting reality. Counselor teaches client that the goal of reality therapy is not only to reach happiness, but also able to accept the responsibility.
Shortly, counselor in reality counseling was active to educate, guide, encourage and contradict client to be able to take responsibility to his behavior to reach therapy goal [12].

Reality therapy goal was to reach success identity, to help client attaining autonomy, namely emotional maturity to change external support with internal support. The emotional maturity was also signed by responsibility readiness upon his behavior [12]. Then proposed that in effort to reach the objective, counselor focuses on effort to develop client potential strength to attain his successful in life. Counselor is able to use technics like: 1) involving in role with client, and involving themselves with client to search for more effectively life; 2) making a joke; 3) contradicting and rejecting whatever reason of client; 4) helping client formulating action plan specifically; 5) Serving client (acting)as teacher and model; 6) Determining limitations and counseling/therapy structure; 7) using accurately sarcasm to be in confrontation with client’s unfairly behavior.

3.3 Interdependent-Independent cultural Orientation

The interdependent-independent cultural orientation concept was proposed by Markus and Kitayama. Markus and Kitayama [13]; [14]; [15] proposed idea about self-construal. There are individual inclined to orient independent construal of self and there are individual inclined to orient interdependent construal of self. The independent construal of self is an understanding who considers self as limited entity, separated from the significant others like relative, colleague, close friend. While interdependent construal of self considers self and other peoples is interconnected, clearly unlimited.

Elaborated by Kitayama and Markus [13]; [14]; [15] that individual who has the independent construal of self has normative tasks surviving the independence, and separated entity from others. Individual was grown up to become himself, to be unique, to express himself, to actualize himself, to have self-esteem upon achievement of his internal attributes and to express the achievement in public area. While individual who has interdependent construal of self tends to express behavior and his achievement based on the affecting situational strength, not based on his readiness. Separation between self and other people is clearly not respected, on the contrary, interconnection among individuals is highly emphasized. Individual carries on normative tasks to maintain interdependence and do self-adjustment to be fit. Individual’s failure maintaining normative tasks caused guilty, this supports individual harmonizing back. Individual who has interdependence construal of self is grown up to be individual adjusting with others, to be a sympathetic person, to place on self as we, and to act properly.

3.4 The effectiveness of Reality Counseling Approach to reinforce responsibility character at students who has background of interdependence construal of self

Effectiveness related to an action, implied the meaning of “berhasil guna” [4]. The effective reality counseling approach to strengthen responsibility character means that the reality counseling is productive to strengthen responsibility character to client. In this paper client was meant as students.

A counseling (therapy) could be effective if looking at related factors, such as client, namely client’s forming the background of psychological aspect and cultural factor. To scholar students client, they are individuals more or less 19-23 years old. This age range was development period named as mid-adolescent and post-adolescent [16]. Their thinking ability was categorized on period of formal-operation [17]. At the period of this formal-operation, adolescent is able to think abstractly, deductive hypothetic, and can solve problem systematically [18].
Viewed from emotional development, mid-adolescent period and post-adolescent period are still period unstable emotion yet (easy to change), they still search for and strengthen their self-identity in variety of values and norms, in order to form their self-character next time. That is why, viewed from developmental psychology, students are developmental periods needing its internalized value reinforcements, including in value of responsibility.

Viewed from social development, mid-adolescent period and post-adolescent period are periods to extend their social interaction from limited in milieu of core family, close family, neighbor, to wider environment, in face to face social interaction or via social media. This is meant that they have placed on themselves within extended social interaction net, including responsibility character formation, adolescent (student) is affected by directly face to face net and unlimited social net via internet and television broadcasting usages.

Culture as forming the background of factor and here is in milieu of adolescent social interaction, can be categorized as west or east cultures, collectivism and individualism cultures, cultures of independent construal of self and interdependent construal of self. East culture, collectivism, interdependence is categorized as one group culture meant similar. On the other side, west culture, individualism, independence is purposed as similar culture group. Indonesian or Asian peoples are considered as society who generally orients to east/collective/interdependent culture.

Counseling viewing cultural factors (multicultural counseling) is so very accurately counseling strategy for Indonesian peoples with heterogeneous society in variety of ethnic and culture. This multicultural counseling was “an integrative approach that draws upon ideas and techniques from existing theories of counselling, and builds them into a culture–informed and culture-sensitive model of practice” [18]. Clearly, multicultural counseling is an approach integrating counseling theory and then combining it in a knowledge practice model and sense of culture.

In cultural varied society, there will be culture difference between counselor and client, in order to need counselor knowledge about forming the background of client. The importance of paying close attention to cultural factor for an effective counseling was proposed by Steward [19] as follows:

"Counselors of college students often adopt the view that the counseling situation should be expanded into an event embedded in the wider context of the total life of the student. The need for this humanizing perspective arises spontaneously when one counsels foreign students. The problems foreign students convey to the counselor frequently bring to the surface cultural values and patterns of thinking that undermine common assumptions in counseling. These assumptions usually are considered universal and, though seldom examined for their cultural limits, they deserve scrutiny if the counseling of foreign students is to be effective”.

The main goal in handling client from various ethnic group (culture) are “to develop cultural flexibility …”, this cultural approach required cultural flexibility and therapist’s high level self-awareness” [18]. In cultural orientation concept of interdependence-independence, counselor used the two cultural orientation continuously suitable for his dominance upon client and its negative-positive sides in effort to solve client’s problem.

In this final study, based on mid-adolescent and post-adolescent’s assumed thinking ability reach formal operation level, unstable emotional development yet, extended social development, client’s interdependent culture characteristic, so reality counseling applied on client (student) watches on the following things:

1. Counselor places on self as model who is able to inspire, to be a model, based on logical thinking, deductive-inductive analysis, systematic, and realistic.
2. Counselor helps student to solve their problem by exploring student’s potential strength and to direct it in order to be founded action plan formulation of concrete problem solving.

3. Counselor confronts student’s irrationally and unrealistically thinking, feeling, action, by building rational thinking.

4. In changing student’s irrational, unrealistically thinking and behavior to be rational and realistically ones in responsibility character, counselor guides student arranging and implementing concrete steps in order to be happened responsibility character reinforcement in student itself, by appearing interdependent cultural values, namely causing ashamed feeling on student if he does not take responsibility, realizing condition that he was rejected or at least less appreciated by surrounding milieu if he did not take responsibility, encouraging students to relate his self-consequence and consequence happened to persons he loves, respects, appreciatessuch as father, mother, brother, other relates, if he did not take responsibility. Strengthening students that he will be appreciated upon his behavior maintaining good relationship, harmonizing, adapting, applying compatible ways in the environment. If students rejected, then they accommodate. Accommodating meant is to accept to keep in upon ideas/recommendations/advises/hopes provided by environment, it does not reject firmly and simply. Other ways are to avoid conflict appearing situation.

5. Reinforcement for interdependent cultural values on students in the university involves all civitas academic as well as the existing system in it. It is done as follows:
   a. Based on class, this was done by lecture while lecture teaches the lecturing material and in daily behavior. Responsibility character applied by lecture on students like through internalizing discipline when present in the classroom, when task completion, bachelorship completion. The lecture also models himself to apply his self-for example in letting students know if coming late or absenting to provide lecturing. Lecture strengthens student’s responsibility character through the applied learning model, such as lecture applies small group discussion learning model, project-based learning, cooperative learning, self-direct learning (cooperative learning jigsaw), collaborative learning, problem-based learning.
   b. Based on extracurricular activities, namely atmosphere creation that conditions student taking responsibility in following activities suitable for his interest and aptitude. Some extracurricular activities that is able to strengthen the student’s responsibility character were activities of Praja Muda Karana (Pramuka), Resimen Mahasiswa (Menwa), Palang Merah Indonesia (PMI), Mahasiswa Pencinta Alam (Mapala).

4 Conclusion

Reality counseling is one of approaches in counseling that considers effective to reinforce responsibility character on clients/students, exceedingly if involving cultural factor who forms the background of student. The relevant cultural factor for Indonesian student, namely culture orienting interdependent construal of self.

Based on the conclusion, it was recommended so that reality counseling/therapy usage toward Indonesian students involves cultural characteristic orienting interdependent construal
of self, and interprets responsibility character as a form of adapting self to environment. On the contrary, for individual orienting independent construal of self, uses the meaning of responsibility character as equilibrium between right and obligation.

References

Implementation of Ministrial Regulation of Education and Cultural, Number 28 of 2016 concerning Quality Assurance of Primary and Secondary Education in Medan City

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Abstract. This study aims to determine the implementation of Ministrial Regulation of Education and Cultural number 28 of 2016 concerning quality assurance of primary and secondary education in the city of Medan (case study at the North Sumatra Provincial Education Office). Data collection methods by observation and interview with the head of service. Checking the validity of the data was done by interviewing several heads of private vocational schools. The results of the study showed that the communication process was not carried out even by unscheduled socialization in the official work program. The consistency of staff communicating permendikbud to principals has not been implemented and scheduled regularly. The disposition that has been carried out is still in the form of information submitted from the Head of Service to official employees. But the information provided is not fully controlled by the staff, and related to internal coordination in the implementation of the policy has not run well and the external coordination between the Education Office and the headmaster is still not effective. The level of consistency in policy implementation has not been good, as seen from the absence of a specific schedule for training principals and to implement the policy.

Keywords: Policy implementation, education, quality assurance.

1 Introduction

Ministry of Education and Culture in 2016 in the draft Regulation of Minister of Education and Culture concerning quality assurance of primary and secondary education. Other facts that occur in the field related to quality assurance, in the context of quality and quality assurance, the problems still faced are: Problems related to the meaning of quality assurance, Related issues with regulation, Problems related to determining and implementing quality assurance policies, Problems related to the essence of data, Problems related to honesty/ objectivity, Problems related to institutions. In connection with the foregoing, it is necessary to have a clear model or system description of the organizational form and implementation of the quality assurance system carried out by the North Sumatra provincial education office at the level of basic and middle education units in the city of Medan as a form of integrated efforts to improve the quality of education.
H. Tachjan (2006) defines the implementation of policy as public policy is the process of administrative activities carried out after the policy is established [1]. This activity lies between the formulation of policies and the implementation of policy evaluation policies containing logic top-down, which means lower / alternative interpreting. Nawawi suggests that policy implementation is the implementation of basic policy decisions, usually in the form of legislation, but can also in the form of important orders or executive decisions or decisions of the judiciary [2]. State that the success of the implementation of policies or programs can be addressed from three factors: (1) Perspective of compliance that measures the implementation of policies from compliance strains of the sea to their superiors; (2) The success of policy implementation is measured by the smooth routine and lack of problems; (3) Implementation of successful policies leads to performance that satisfies all parties, especially the expected beneficiary groups [3]. Solichin (1997) suggests that there are three factors that can lead to failure of policy implementation, namely: (1) policy issues. Policy implementation can fail because there are still uncertainties or internal or external insecurity or the policy itself, indicating a lack of resources related to help; (2) Information. Information shortages easily lead to an inaccurate picture of both the policy object and the implementers of the contents of the policy that will be implemented and the results of the policy; (3) Support. Implementation of public policy will be very difficult if the implementation is not enough support for the policy [3].

In general, the stages in policy making are described as a cycle that contains a formulation of the existing awareness: (1) Problems that require policy interference; (2) Defining the real problem, namely looking for causes or root causes, not the consequences arising from the problem; then (3) Identifying solutions to overcome these problems. Of the various solutions that exist then (4) Evaluated the most feasible options to do with considering the impact. Grindle says that in implementing a policy depends on the content (content) and context, and the success rate depends on the condition of the 3 variable components implementation resources needed [4]. These three components cause national programs to produce different variations of outputs and outcomes in the region. The three components are: Contents of policy messages, Credibility Policy form of Model perspective policy implementation Top-down developed by George C. Edward III. Edward III named the model of Public policy Implementation with Direct and Indirect Impact on Implementation [5]. In the theoretical approach of George C. Edward III there are four variables that influence the successful implementation of a policy, namely: Communica-tion, Resources, Disposition, Bureaucratic Structure.

Policy implementation consists of a series of processes starting from: (1) data collection, (2) data analysis, (3) reporting / mapping, (4) preparation of recommendations, and (5) efforts to implement recommendations in the form of education quality improvement programs. Short (2009) suggests that the stages of the SPMP process are a cycle that is interrelated and takes place in a sustainable manner. The implementation of the above stages needs to be carried out collaboratively by various stakeholders in school according to the mandate of the SBM [6]. Educational quality assurance is carried out on the basis of the principles of: Sustainability, Planned and Systematic ,, Respecting the autonomy of formal and non-formal education units, Facilitating informal learning of sustainable communities with minimal state regulation, the SPMP is an open system that continues to be continuously improved.
2 Methodology

This research is a policy research (policy research) that focuses on policy implementation research. S. Danim said, that policy research is one of the types of descriptive research with the aim of making recommendations needed by policy makers [7]. Research was carried out in the education office of the province of North Sumatra, with the consideration that the education office of the North Sumatra province was an institution/agency implementing education quality assurance policies in the city of Medan, especially the level of high school and vocational high schools both private and private, to obtain stronger information then some private Vocational Schools in Medan were chosen. The time of this research will be conducted from June 2018 until the saturated data has been obtained.

According to Moleong (2014), Data collection techniques that are generally carried out in qualitative research are observation, in-depth interviews, documentation studies [8]. Techniques analysis used in the analysis of this research are qualitative analysis, meaning that after the data is collected classified and then the data is processed and managed by the data using more sentence expressions as interpretations of the processed data.

3 Result and Discussion

In terms of delivering the message of the Education Office, North Sumatra province cannot be said to be good. because the message delivered by the Education office to the principal has not resulted in the implementation of a good policy. In addition, due to the absence of a specific schedule that was made to conduct training for principals in terms of implementation of quality assurance of education and seemed to consider it unimportant, the Ministry of Education and Culture had already been issued in 2016 but until 2018 it was still not well implemented. for school principals, the delivery of messages was only done briefly on the sidelines of training events that discussed other matters.

Information obtained by the ministry from the Ministry of Education and Culture is clear, but what is conveyed to the school principal by the Education office is still unclear, because the submission is less serious and well planned, this is evident by the delivery of the school principals training. which discusses other things. Thus the conclusion, in terms of clarity in the implementation of this policy, cannot be said to be good.

Information submitted by the Education Office to the principal regarding quality assurance can be said to be consistent and unchanging, this is also because the Permendikbud is still relatively new and no revisions have been made so that nothing has changed from the policy, but in carrying out the policy is still far from good. Quality assurance in the Education Office is good enough even though there is no structure, especially for the quality assurance team, because they are also placed in a position in accordance with their abilities and competencies, only upgrading or special training is needed to handle quality assurance to further hone the skills of the staff in quality assurance.

Information obtained by the Education office is quite clear, because indeed the contents of Ministrial Regulation of Education and Culture (so-called: Permendikbud) No. 28 of 2016 are clear about things that must be done and there are also guidelines for the implementation of education quality assurance, but the delivery procedures are not good and impressed. evenly received by all head of vocational schools, especially private vocational level.
In relation to authority, the education office has authorized quality assurance staff and quality assurance staff to convey the authority to principals to assume responsibility for quality assurance in the schools they lead to improve the quality of education in the schools they lead. Availability of facilities in facilitating the implementation of quality assurance can be said to be good, this is evidenced by the availability of applications that make it easier for school operators and principals to communicate and take care of all kinds of things related to the quality assurance of Education in the way they lead.

Socialization regarding the implementation of Ministerial Regulation of Education and Culture, Number 28 of 2016 concerning quality assurance is far from good, this is evident from the lack of a specific schedule for conducting socialization activities to principals in North Sumatra, especially in Medan, so there is a need for improvement in this case. In terms of training the implementation of quality assurance Education for principals is still far from good and seems less serious, this is evident from the lack of training schedules for the implementation of education quality assurance for principals in the Education official work program and the Education quality assurance department in the city Medan at the SMK level.

Evaluation and monitoring activities can be said to be good, but the arrival schedule of supervisors is not evenly distributed and seems not the same, some come once a month, some come every two months. So the schedule for the visit of the supervisor to school must be improved and must be supervised so that the supervisor's visit to school is more routine and scheduled each month. Primarily the consistency of the implementation of Ministerial Regulation of Education and Culture No. 28 of 2016 cannot be said to be consistent, because the implementation has not been specifically scheduled and carried out only when there are other activities and inserted the implementation of the Ministerial Regulation of Education and Culture.

Looking at the flow of communication in this study, the Education Office and the heads of Private Vocational Schools have less intense relations and communication related to the implementation of this education quality assurance policy. The principal is very dependent on information from the education office as the main initial implementer, while the agency must also strive to socialize this policy to the principal for the sake of the implementation of the policy. In fact, in the field, the principal only carries out quality assurance according to the Foundation's instructions, without referring to Ministerial Regulation of Education and Culture, number 28 of 2016 and without referring to directives that should be submitted by the Education office. This led to a reason from the principal that they did not know who to ask, so they extracted information from the internet and other online media.

Sunber Primal has a good power, this is proven by the complete equipment that can be used to implement the quality assurance of Education, to the availability of online applications for quality assurance. However, the findings in the field have not been done at all in accordance with the policies written in the Ministry of Education and Culture. Even from three schools conducted observations and interviews. None of the schools have education quality assurance staff. And the problems found are in the case of financial facilities not yet budgeted through the APBD.

Looking at the implementation of Ministerial Regulation of Education and Culture conducted by the education office for private vocational schools, it has not had a positive impact, and even it seems that there has been no impact at all, private Vocational Schools conduct their own quality assurance without any meaningful interference from the education office, they perform quality assurance at their schools by looking at what is needed by the school and its students, and based on the rules issued by the Foundation or the school leadership. Other evidence, it appears from schools that have not formed a special team to
conduct and administer education quality assurance at the school. So what can be drawn from the overall data above is that, starting from the issuance of Ministrial Regulation of Education and Culture number 28 of 2016 up to now and the implementation carried out by the education office, it has not had good consistency and has not given meaningful impact to private vocational schools in the city of Medan.

4 Conclusion

The process of communication, lack of socialization process. Based on observations and interviews conducted in three schools, socialization has not been carried out by the North Sumatra Provincial Education Office on a scheduled basis.

Resources, the availability of information is still very minimal when compared to the availability of other educational information such as teacher certification, the authority of the Education Office should be the mediator of the implementation of the quality assurance of Education, but the authority is still far from good. The facilities, both in the form of facilities and infrastructure and financial facilities in their implementation, are already good problems, this is evidenced by the complete equipment that can be used to implement implementation, to the availability of online applications for quality assurance. But the absence is carried out in accordance with the policy written in the Ministry of Education and Culture. And another problem is in the case of financial facilities not yet budgeted through the APBD.

Consistency in implementation, there has never been any socialization in the form of training, training, or workshops by the Education Office, the implementation has not been said to have good consistency and has not been too positive, and even impressed that there has been no impact.

References

Implementation of School Principal Academic Supervision at a Vocational School, Sekolah Menengah Kejuruan Swasta Harapan Alwashliyah Sigambal Labuhan Batu District

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Abstract. This study aims to find out: First, preparation of the academic supervision program for principals of SMK Swasta Harapan Al-Washliyah Sigambal, Labuhanbatu District; Second, the implementation of academic supervision of the principal of SMK Swasta Harapan Al-Washliyah Sigambal, Labuhanbatu District; and Third, follow-up to academic supervision of the principal of SMK Swasta Harapan, Al-Washliyah Sigambal, Labuhanbatu District. This type of research used qualitative approach, qualitative research is an approach in conducting research oriented to natural phenomena or symptoms. The subject of this research was directed to the search for data from the Principal, teachers, and other parties who were considered to be able to provide answers to research problems. Data search started from the principal in this case the principal as a key informant. Data-collection instruments used are: observation; interview; and documentation. The results showed that: Implementation of the academic supervision competency of the principal of SMK Swasta Harapan Al-Washliyah Sigambal consisted of planning, implementing, and following up academic supervision.

Keywords: Academic supervision, principal, learning management.

1 Introduction

In order to realize Indonesia's quality and competitive human resources, the government has made various efforts to improve the quality of education. The Government through the Badan Standar Nasional Pendidikan (BSNP) has issued National Education Standards, which consist of: 1) content standards, 2) process standards, 3) graduate competency standards, 4) standards of educators and education personnel, 5) standards of facilities and infrastructure, 6) management standards, 7) financing standards, and 8) educational assessment standards (Government Regulation Number 19 of 2005).

According to Mulyasa that principals are responsible for carrying out educational activities, school administration, coaching other education personnel, and utilizing and maintaining infrastructure [1]. Therefore the principal as the school leader must always conduct monitoring and guidance to the teachers in an effort to improve teacher professionalism. Based on the above opinion can be understood that academic supervision is the supervision of the principal to the teacher who serves to provide assistance to teachers in carrying out the teaching and learning process in schools [2].
Based on the background that has been described, the researcher intends to carry out further research on implementation of school principal academic supervision at a vocational school, that is SMK Swasta Harapan Alwashliyah Sigambal Labuhan Batu, which the research focus is the implementation of academic supervision by the Principal of SMK Swasta Harapan Al-Washliyah Sigambal, Labuhanbatu District.

The problems examined in this study are as follows: (1) What is the planning of the academic supervision program of the principal at SMK Swasta Harapan Al-Washliyah Sigambal, Labuhanbatu District; (2) What is the implementation of the academic supervision of the principal at SMK Swasta Harapan Al-Washliyah Sigambal, Labuhanbatu District; (3) How do you follow up on the academic supervision of the principal of SMK Swasta Harapan Al-Washliyah Sigambal, Labuhanbatu District; (4) What are the constraints and solutions for the implementation of academic supervision at SMK Swasta Harapan Al-Washliyah Sigambal, Labuhanbatu District?

Based on the research focus above, the objectives in this study are: (1) To find out the preparation of the academic supervision program of the principal at SMK Swasta Harapan Al-Washliyah Sigambal, Labuhanbatu District; (2) To find out the implementation of the academic supervision of the principal at SMK Swasta Harapan, Al-Washliyah Sigambal, Labuhanbatu District; (3) To find out the follow-up to the academic supervision of the principal at SMK Swasta Harapan, Al-Washliyah Sigambal, Labuhanbatu District; (4) To find out the Constraints and Solutions for the Implementation of Academic Supervision of SMK Swasta Harapan SMK Al-Washliyah Sigambal, Labuhanbatu District.

2 Methodology

This study used qualitative approach, qualitative research is an approach in conducting research oriented to natural phenomena or symptoms. In qualitative research there are several methods in its implementation including: phenomenology, ethnography, case study, historically. In this study researchers used a qualitative case study because the researcher examined a case of a phenomenon that occurred in the school of SMK Swasta Harapan Al-Washliyah Sigambal in Labuhanbatu District. The phenomena that occur in the object of the study mentioned are the low performance of the teachers in the object of the research. This research was conducted at SMK Swasta Al-Washliyah Sigambal, Labuhanbatu District. The choice of this place is based on the consideration of the ease of obtaining data, the researcher focuses more on the problem to be studied where the location of the research is known that the teacher competency is still low which is thought to be influenced by academic supervision conducted by the principal has not been carried out perfectly well.

The data collection techniques conducted in this study are various. First, an interview. An interview is a conversation with a specific purpose. Conversations are carried out by two parties, namely the interviewer (interviewer) who asks questions and the interviewer (interviewer) who provides answers to the question [4]. Second, the documentation. Documentation method is one of the data collection methods used in social research methods. In essence, the documentation method is a method used to trace data as a whole correctly. Third, a direct observation is a way of retrieving data using the eyes without the help of other standard tools for these purposes. Observation or observation is one of the most important research techniques.
3 Results and Discussion

Geographically SMK Swasta Harapan Al-Washliyah Sigambal is located in the middle of Sigambal and is close to the tax, and close to the Labuhanbatu District government. So that it is very possible for the school to attract students from all directions, and the distance between schools is not far apart and can be reached. The school was established on January 1, 1987, with the status of school building rights. To date the accreditation of SMK Swasta Harapan Al-Washliyah Sigambal is B, since October 20, 2009, the number of students participating in teaching and learning activities at SMK Swasta Harapan Al-Washliyah Sigambal is 175 students, with 87 male students and 68 female students. At SMK Swasta Harapan Al-Washliyah Sigambal currently, the number students who got improvement are so fast, the increase is 475 vocational students and there are 37 trainees, consisting of 17 men and 20 women.

Based on the results of interviews with research subjects, namely the principal and several teachers, it was known that the main purpose of conducting academic supervision was conducted by the principal. the teacher to improve his ability as a teacher. This is in accordance with what the school principal said as follows. “The supervision is a help, so we monitor the teacher first, then after we monitor we know the strengths and weaknesses so that later determin the supervision or assistance provided, even as in determining the material, methods, or learning resources that will continue to be supervised. So supervision is not only assessing, but it can be said to be a help to the teacher” (Results of interview P on 11 May 2018).

Before carrying out academic supervision, it is known that the principal undertakes planning in advance [4]. After planning the new academic supervision, then the principal conducts a follow-up on the results of the supervision obtained. This is as stated by the principal as follows.”In the implementation, we plan, prepare instru-ments first, after that supervision will take place, and later we will also follow up the results of the supervision that has been carried out” (Interview results on May 10 2018).

3.1 Academic Supervision Planning

Academic supervision is conducted by the principal has been scheduled at the beginning of each semester. So that in carrying out supervision of the school principal just see the existing schedule. This is as expressed by the principal as follows. "Usually for the supervision, we program one year, two semesters, then at the beginning of each semester in the second month we conduct supervision in general, but if we feel it is necessary to do it outside. But what is clear is that in that semester we try to give all our teachers supervision" (Interview P on 11 May 2018).

The results of the interview are supported by the results of a documentation study on the implementation schedule of academic supervision. In this schedule, it can be seen that academic supervision conducted by the principal is carried out in August and February. The supervision schedule that has been prepared is often informed to the teacher but sometimes not notified to the teacher. The following is the schedule for supervising the principal at SMK Swasta Al-Wahliyah: Appendix 6 Schedules of Implementation of School Principal Supervision for Year 2017/2018
3.2 Implementation of Academic Supervision

The principal undertakes several academic supervision techniques and uses an academic supervision approach. In carrying out academic supervision the principal must use supervision instruments and other records to make it easier to provide guidance to the teacher. As the Principal said about the implementation of supervision of the teacher that in carrying out academic supervision the writer used the supervision instrument and also noted the things that needed to be the material of guidance from the results of the supervision that the writer carried out on the teacher. Supervision instruments, observation sheets or notes during supervision are objective data that can be used as input or material in coaching. Based on the implementation of academic supervision carried out by the principal in getting the following results:

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Planning</th>
<th>Implementation</th>
<th>Relationship</th>
<th>Student Activities in Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Asfan Maha Dalimunte, S.Pd.</td>
<td>4,16</td>
<td>4,66</td>
<td>6,66</td>
<td>2,14</td>
</tr>
<tr>
<td>2</td>
<td>Asal Ritongan, S.Pd.</td>
<td>4,5</td>
<td>7,1</td>
<td>8,3</td>
<td>1,7</td>
</tr>
<tr>
<td>3</td>
<td>Maradona Rambe, S.Pd.I</td>
<td>6</td>
<td>8,16</td>
<td>8,66</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Najamuddin Ritonga, S.Pd.</td>
<td>3,83</td>
<td>4,33</td>
<td>5,66</td>
<td>1,57</td>
</tr>
<tr>
<td>5</td>
<td>Suhardi, S.Pd.</td>
<td>5,5</td>
<td>7,16</td>
<td>6,66</td>
<td>2,14</td>
</tr>
<tr>
<td>6</td>
<td>Gunawan, S.Pd.</td>
<td>5</td>
<td>5,33</td>
<td>5,33</td>
<td>2,14</td>
</tr>
<tr>
<td>7</td>
<td>Ilyunida Hasibuan, S.E.</td>
<td>3,83</td>
<td>4,83</td>
<td>5,33</td>
<td>1,57</td>
</tr>
<tr>
<td>8</td>
<td>Hariyati, S.Kom.</td>
<td>4,16</td>
<td>5</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

Based on the table above can be seen below in the implementation of supervision is not maximal because there should be 27 supervised teachers but at the time of implementation only 8 teachers were supervised, and the results of supervision also showed that the ability of teachers to plan, carry out learning is still very low.
3.3 Constraints and Solutions for Academic Supervision

Overall, the implementation of academic supervision by the school principal is already going well. However, the success of the implementation of academic supervision activities by the principal of SMK Swasta Harapan Al-Washliyah Sigambal is inseparable from the constraints. The obstacle faced is the difficulty of carrying out supervision in accordance with a predetermined schedule, given the many tasks and activities of the principal. The following is an excerpt from the interview that stated this.

"The problem is time, because I also have to teach, meetings and other activities, so to focus time and adjust the schedule is a little difficult. Like yesterday, I had a sudden meeting, even though there was a supervision schedule at that time, so it had to be postponed."

(Interview results on May 28, 2018). From the results of the interviews above, supervision is still carried out despite constraints in the time and busyness of the principal. By rearranging the schedule, supervision activities can still run well.

4 Conclusion

Academic supervision planning is still not optimal, especially concerning the development of teacher professionalism, which needs to be done continuously, planned and sustainably. Academic supervision at SMK Swasta Harapan Al-Washliyah Sigambal is carried out periodically, which is carried out at the beginning of each semester in accordance with the schedule that has been prepared and has been socialized to the teacher. Bearing in mind that the quality or quality of coaching in a school is also influenced by the ability of vocational school principals to plan; carry out and follow up on the results of supervision of the academic towards the teacher in order to improve teacher professionalism, then the ability of vocational school principals in carrying out academic supervision must be further improved.

One of the low causative factors in the academic supervision competence of Vocational School principals is the low ability of vocational school principals to plan academic supervision programs. During this time the head of the Vocational School made a supervision program, only the implementation sometimes did not meet the schedule. Because together with other activities such as meetings and other non-academic activities that take up a lot of time the principal.

The revisions carried out by the principal need to be followed up so as to have a real impact on improving the professionalism of the teacher's work. The first step taken by the principal SMK Swasta Harapan Al-Washliyah Sigambal in following up on the results of the study was to review the summary of the research results. The summary of the research results is then submitted to the teacher and reviewed with the principal. The academic supervision program in its implementation is not in accordance with the schedule, some are supervised and some are not supervised by the vocational school principals. As a result the performance of teachers in carrying out learning is also relatively low. This will have an impact on the quality of learning.
5 Suggestions

Based on the conclusions of the results of the study, the authors can provide suggestions as follows:

a. Preparing academic supervision plans in order to improve teacher professionalism, after that academic supervision is carried out using appropriate technical approaches and supervision principles, then the results of supervision are followed up so that supervision activities are useful in order to improve the quality of teacher learning. Vocational schools do not have a supervision program specifically, there is only general, namely the schedule of supervision implementation in the Vocational School Work Plan only.

b. In carrying out academic supervision, the techniques used must be in accordance with the problems and characteristics of the teacher, so that it will produce effective academic supervision activities. The head of the school and also the teacher must utilize the results of academic supervision as well as possible, so that academic supervision can have a real impact on learning in school, improving teacher professionalism, and fostering motivation and working spirit of the teacher.

c. Supervision shows that the implementation of supervision by the headmaster of SMK Swasta Harapan Al-Washliyah Sigambal is carried out integrally with the education program, because the timetable has been adjusted to other educational programs.

d. The teacher needs to prepare it all because in the supervision activities the principal does not only assess the teaching method of the teacher, but also evaluates the components that support the implementation of teaching and learning activities. In its implementation, the principal assesses the teacher as a whole starting from the administration of learning, the learning process, and other supporting components in learning.

References

Development of a Competency-Based Management Model in the Production Unit of Sekolah Menengah Kejuruan Negeri 1 Panyabungan

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Abstract. This study aims to find a competency-based management model of Management Field Management in the Production Unit of Sekolah Menengah Kejuruan (SMK) Negeri 1 Panyabungan; knowing the appropriate Competency Based Management Product Operational Standards (SOP) applied in the Production Unit of SMK Negeri 1 Panyabungan; find out the results (output) of the application of the Expertise Competency Based Management Model in the Production Unit of SMK Negeri 1 Panyabungan. The number of research samples was 90 students with purposive sampling technique. Data is collected by observation, inventory, questionnaire, and documentation. Hypothesis testing is done with i-t test and the calculation process is carried out with the help of SPPS. From the two trials, the results of the average production unit management were found; the first trial was 93.12%, the second trial was 96%. And the results of the study show that: First, the Management Competency-Based Management Model of Business Management Skills is feasible to be applied in the Production Unit of SMK Negeri 1 Panyabungan. Second, Establishing Operational Standards (SOP) for Management Based on Competencies in Business Management Field Management is precisely carried out in the Production Unit of SMK Negeri 1 Panyabungan. Third, Producing a Competency-Based Management Model in the Management Business Field of the Production Unit of SMK Negeri 1 Panyabungan consists of two components, namely the Product Unit as the source of production and the Production Unit as a source of funding concludes that 96.5% is very good if implemented.

Keywords: Development of Management Models, Expertise Competencies, Production Units, Vocational Schools.

1 Introduction

Education is a basic need for all beings who have the means of thinking, namely reason. Almost everyone defines that education is sending their children to a school that provides knowledge to their children. In short, for the general public education is only obtained in schools. Therefore, improving the quality of education needs to be done to train the younger generation to develop the progress of the nation that will be able to answer global challenges in facing its future. One of the educational institutions that are heavily related to labor problems is Vocational High Schools (the so called SMK). Vocational education is an educational path that aims to train students to become trained, competitive and productive workforce in accordance with their respective fields. Unfortunately, this cannot be true.
Vocational education is part of an education system that prepares a person to be better able to work in one group of work or one field of work than in other occupational fields. To produce graduates of the vocational high school must be productive people. According to the Law No. 20 of 2003 concerning the National Education System: Vocational education is an education that prepares students to be able to work in certain fields. However, there are constraints that must be faced by vocational education, namely: (1) relevancy and quality of vocational secondary education is still low, (2) access to vocational secondary education services is inadequate, and (3) education management is still not efficient. To deal with these obstacles, one of the methods taken is to make improvements in the teaching-learning process in vocational schools.

From the observations carried out by researchers starting in January 2017, information was obtained that SMK Negeri 1 Panyabungan is a Business Management Vocational School. Initially this school took care of only the business and management fields of accounting expertise, office administration and marketing competence. Along with the progress of the times and the needs of the world of work in 2006, the Computer and Network Engineering (TKJ) expertise program was opened in the field of Information Technology and then developed again starting in 2016, the Multimedia and Banking expertise program was opened again. This school is one of the vocational schools that have implemented Production Unit (UP). Management of UP in SMK Negeri 1 Panyabungan is carried out to enhance the potential of each study program in the form of services and goods consisting of the business fields of Stores, Mini Banks, Student Canteens, Typing Services, Photo Copy, Computer Screen Printing, Animation Design, Photographers, Computer, Warnet and Internet Network installation services.

Activities carried out at the UP marketing branch are management of student canteens and shops selling office equipment, electronic goods, basic needs of students, basic needs of the community and promotion of student services to the general public and other expertise programs. Branch UP accounting and banking activities have a mini bank services unit. Financial services managed are credit and debit services to customers for senior high school (SMA / SMK / MA) students in Mandailing Natal District. Where the mini bank works with 3 Commercial Banks, namely: North Sumatra Bank, Bank Rakyat Indonesia, and Bank Mandiri in the Panyabungan Branch. Activities at the Branch UP Office Administration are engaged in services in the type and photo copy in 3 (three) unit locations in Panyabungan. The location is placed in a strategic area, so that the services offered are very much visited by customers, both students, employees up to the general public. Branch UP TKJ and multimedia activities are computer service services, animation designers, computer screen printing and internet networks have 3 (three) units as well.

Many experts say about the understanding of the model according to the Indonesian Dictionary, model is defined as a pattern (example, reference, variety) of something that will be created or produced (Pusat Bahasa, 2013: 75) Meanwhile, according to Martubi "The model is the abstraction of reality by focusing on several characteristics of real life [2]. Based on the opinions above it can be concluded that the model is a form of pattern that is emulated, either in physical form of a work or a picture (abstraction) of reality. Hasibuan said that: "Management is the science and art of managing the process of utilizing human resources and other resources effectively and efficiently to achieve a specific goal [3]. While Griffin suggested that management is the process of working together between individuals and groups and other resources in achieving organizational goals as activities of management [4]. From several definitions or understanding of management above, it can be summed up that management is: (a) the existence of cooperation between elements within an organization; (b)
the existence of an effort to utilize the elements of the organization; (c) the existence of clear objectives to be achieved by the organization; (d) arrangements to achieve organizational goals.

According to Mulyasa the competence of expertise is a combination of knowledge, skills and attitudes that reflect in the habit of thinking and acting [5]. Further According to Boyatzis argues that the competence of expertise is the capacity that exists in someone who can make the person able to fulfill what is indicated by work in an organization capable of achieving the expected results [6]. From the definition of the statement above it can be concluded that the competence of expertise is defined as a set of mastery of skills, values and attitudes that must be possessed and mastered by students according to standards set by the government sourced from education, training and experience so that they can work professionally. From the description of the competency management management model development above, a conclusion can be drawn that the purpose of the competency-based management model development expertise in this study is an effort to utilize existing resources through planning, organizing, mobilizing and controlling to achieve the knowledge, skills and attitudes possessed students according to the graduates' competency standards (SKL) SMK.

Vocational secondary education is the only one from the education system in schools that is specifically prepared to produce mid-level skilled labor to fill the needs of business, industry and development. In order to achieve the objectives of the defined production unit, schools in running this business unit must always carry out good management. Therefore, in implementing the production unit program, the school makes a management model, which is a business that produces goods or services, optimally utilizing all forms of capital in schools and management which are supported by a chain or business network that requires each other or mutually beneficial. In addition, businesses in the form of production units need to be supported by the management system such as: marketing, promotion, research and development, quality control, and others. Based on the link and match concept that has been mentioned that one of the realization is the production unit management policy at the school. The production unit can be said to be a miniature of a company that has a lot to do with everything related to the company, namely: business status, goals, objectives, scope and management in the business. Furthermore, business fields can be classified into production and services. The service sector is a business that can be directly enjoyed by consumers, while businesses in the field of production generally cannot be directly enjoyed by consumers.

2 Methodology

The study was conducted at Panyabungan Vocational School 1, the so-called SMK Negeri Panyabungan 1, in Mandailing Natal District, North Sumatra Province. Limited trial subjects involved 35 respondents / sample students. The trial subject was expanded to work effectiveness analysis of the management model involving 60 students in the Business Management Competency-Based Production Unit Expert group participants and 60 students in the control group of the conventional Production Unit implementing participants including 5% experimental experiment reserve. Determination of the experimental group with random selection. The sample of the experimental and control groups represented the student population in each skill program at SMK 1 Panyabungan which included 4 Expertise Programs (Accounting Skills Program, Office Administration, Marketing, and Banking).
The method used in this study is the research and development model or Research and Development (Borg & Gall, 1983; 772). As for what was developed in this study is the Management Competency-Based Management model in the Production Unit. The development model that is carried out is by testing the model or product. Model or product trials are a very important part of development research, which is carried out after the product design is complete. The trial of the model or product aims to find out whether the product made is suitable for use or not. The trial of the model or product also looks at the extent to which the product made can achieve the goals and objectives. The trial was conducted 3 times: (1) two limited tests were carried out on small groups; and (2) field tests (testing fields).

Trial, the quality of the model or product developed is truly valid construct empirically. The steps in carrying out the analysis taken in the development research (research and development) include: (1) collecting data through discussion or focus group discussions (FGD), (2) designing the research, (3) developing the model, (4) testing limited phase I (5) revising the trial hasill model (6) strengthening the model is done by limited trial II to different schools, (7) refinement of the model, (8) strengthening the model with field testing in rayon schools, (9) refinement model, and (10) dissemination and implementation. The development of the model in this study is referred to as the Competence-Based Skill Management Model with the Organizing System in FGD (Focus Group Discussion) activities and experiments.

Research and development in this case is used as a procedure to develop a Management Competency-based management model in the Production Unit at SMK Negeri 1 Panyabungan in various skill programs. Based on the research procedure, it is expected to produce a product in the form of Management Competency Based Business Management Skills model in the Production Unit of SMK 1 Panyabungan that meets the principles of link and match which is a necessity for the growth of independent entrepreneurial spirit based on the students' competency with educational institutions with various transitions from workplace school.

Thus the development model in this study includes preliminary investigation activities, determine the plan and define direction, design development, demonstrate, design, evaluate and revise trials (test, evaluation and revision), developing, and presenting development results. In accordance with existing instruments, data collection techniques used in this study are questionnaire techniques, interviews, and documentation. In this case the research instrument is distributed directly to students who are members of the Production Unit. The experimental group and the control group as respondents were filled out. In order for the instrument to be filled with full concentration, there is a sufficient / different time lag between the distribution of test instruments and questionnaires to respondents or samples.

The data analysis process begins by gathering all the things obtained by the author from several sources: students who are members of the Production Unit, the consents are directly related to the activities of the Production Unit, then summarized, selected, categorized and interpreted according to the focus of the discussion in the study with the Focus Group Discussion model (FGD) together with the manager of the Head of the Production Unit of SMK Negeri 1 Panyabungan and combined with SWOT analysis techniques (Strengths, Weaknesses, Opportunities and Threats) for Human Resources related to the Production Unit. Data analysis techniques include data analysis of model development and analysis of experimental data. Data analysis of model development with this construct is done by confirmatory factor analysis or Confirmatory Factor Analysis (CFA). Validity test aims to determine the ability of indicators in measuring variabellaten.
3 Result and Discussion

Since the merger of SMK Negeri 1 was established in 1990 having its address at Jalan Sukaramai Aek Galoga Panyabungan, located at 61 SL and 120 NL. Until now, SMK Negeri 1 Panyabungan apart from having the facilities and infrastructure as the supporting capacity of scientific development that is needed also has a reliable teaching staff, both in terms of quality and quantity, the development of the Production Unit (UP) of each expertise program is a priority plan this school. Joint Venture 1 State Vocational School in the 2017/2018 school year has 58 educators. In terms of facilities, SMK Negeri 1 Panyabungan has a laboratory, library, small mosque, guesthouse, shared learning resource center (PSBB), art facilities and sports, and also has free hotspot facilities for internet use.

The key to the success of SMK Negeri 1 Panyabungan in creating skilled and competent medium power, lies in the ability of Human Resources (HR), especially teachers. To obtain quality human resources, the SMK Negeri 1 Panyabungan training and development for teaching staff to be more competent in the field of competence they have, and the knowledge is transformed to students through real work in the development of school production units. The Production Unit (UP) is carried out with the goal of students gradually and will be accustomed to being skilled to develop small businesses which are expected to provide experience in entrepreneurship and manage it properly and appropriately, so that after completing their education they will be able to create their own jobs or be able to compete with the people around him.

The dimensions of activities in this study are the management of the Production Unit which consists of the Production Unit as a learning resource and the Production Unit as a source of funding. Production Unit activities as learning resources and Production Units as funding sources are seen from the POAC management function (Planning, Organizing, Actuating, and Controlling). In the planning stage the model is focused on (1) formulating the objectives of model building, in this case the management of the SMK Production Unit Business and Management Expertise Study Program; (2) determine the target user of the model, namely the leader and manager of the Production Unit who can utilize in terms of the management of the Production Unit management; (3) and specify the model components, namely the model components that make it easier for users to implement the model. In this case the management component of the Production Unit contains the Production Unit as a learning resource and the Production Unit as a source of funding, the clarity of the component model structure, the clarity of the relationship between the components of the school funding source development model, the readability of the model and the feasibility of the model.

In the model development stage the following things are done: (1) the first stage model validation; (2) model revision; (3) second stage model validation; and (4) revision of the operational model. Model testing was carried out in two stages: the expert judgment stage and the model effectiveness test stage. The expert judgment stage is to ask a number of people who have expertise in the development of management models of the SMK Production Unit in the Business Management Field of Management to provide an assessment of the model that has been developed. The steps taken are as follows: (1) determine the management development model of the SMK Production Unit Business and Management Expertise Study Program the results of previous development; (2) establishing panelist members based on expertise; (3) preparing instrument items based on the model variables proposed; (4) sending questionnaires to instrument answers and correcting the model to be returned; (5) send back the repaired model for review; (6) the researcher invites panelists to clarify and discuss the answers and revised notes stated so that a consensus is reached; and (7) make a report.
The trial of the effectiveness of the model is intended to test the level of effectiveness of the model in its use. The target of the trial was chosen based on respondents who had expertise in the field of application of the management model of the SMK Production Unit Business and Management Expertise Study Program. The trial of the effectiveness of the model used a questionnaire containing the opinions / perceptions of respondents on the effectiveness of the proposed model. Because this model has not been implemented for actual implementation, it is called internal effectiveness.

Production units and school services are a process of business activities carried out by schools / madrasas on an ongoing, academic and business basis by empowering school / madrasah citizens and the environment in the form of production / service business units that are managed professionally. Because production units and school services are a place of entrepreneurship in schools, they must be managed academically/ business and institutionalized in a business entity. The purpose of carrying out production activities and services in schools is:

a. production / service based training facilities for students,
b. grow and develop the entrepreneurial spirit of teachers and students,
c. help funding for maintenance, additional facilities and other educational operational costs,
d. increase the spirit of togetherness to increase productive activities and welfare for teachers and students,
e. develop an independent and confident attitude in the implementation of student practice activities,
f. Increasing creativity and innovation among students, teachers and school management, as well as building the ability of schools to establish synergic collaboration with local parties and the wider community.

As a learning resource for students and funding sources for education in schools, management of production units and school services is developed by developing principles; independence, accountability, transparency, partnership, participation, effective and efficient. Based on the explanation related to Production Unit management that occurred at SMK Negeri 1 Panyabungan, there were found some problems and weaknesses that often occur in the Production Unit management so that the results obtained from the implementation of Production Unit management were not optimal, the problems were: first, not all schools have building facilities which is sufficient to be used as a Production Unit. Second, Production Unit planning is still monotonous. Third, the organization that still overlaps. Fourth, the implementation of learning in the Production Unit does not run in several schools. Fifth, people outside of school still lack trust in the production / service results from the SMK Production Unit. Sixth, in SMK 1 Panyabungan, the results of the Production Unit are used to finance extracurricular activities. Seventh, supervision of the Production Unit at SMK Negeri 1 Panyabungan directly from the Inspectorate, so the school feels objected if the results of the Production Unit must be deposited in the State Treasury. Therefore, steps to bridge the problems that occur in the management of the existing SMK Production Units, it is necessary to develop a Production Unit management model. The results of the development of the SMK Production Unit management model are expected to be a solution to achieve the ideal goals of the Production Unit activities and are feasible to be applied in SMK.

The development of the SMK Production Unit management model is focused on two components supporting the management of the Production Unit, namely the Production Unit as a learning resource and the Production Unit as a source of funding. The contents of the
components The production unit as a learning resource consists of four management aspects, namely: (1) planning consisting of a clear vision, mission, and objectives as the first step in the formation of a Production Unit; (2) organizing consists of guidelines for organizing organizations, organizational structures and job descriptions; (3) the implementation consists of the division of the teacher's duties, the division of tasks of the teaching staff, the syllabus- RPP, and the rules of learning in the Production Unit; and (4) supervision consists of supervision of students, internal evaluation of the production unit, and evaluation of education educators.

The Production Unit as a funding source consists of four management aspects, namely: (1) planning consisting of: business environment analysis design, service product overview, competition analysis, price strategy, overview of competitive advantages of the SMK Production Unit, overview of market segmentation methods used, overview location, description of promotional plans, identification of management and personnel, unpredictable risks, and identification of raw material suppliers; (2) organizing is made the organizational structure and job description; (3) implementation consisting of excellent service activities, production unit production time settings, production personnel arrangements, production layouts, production support equipment and marketing management; and (4) supervision which consists of supervision of costs, quality and time of production, personal supervision and submission of claims-sanctions.

3.1 Management Model of the Production Unit

Based on the explanation of the theory and concept of the Production Unit formulated a Production Unit management model consisting of components of the Production Unit as learning resources and as a source of funding. All components cannot be separated from one another. Through the production unit, students learn about how to plan, implement and supervise the course of the production unit, study customer tastes, plan products, product feasibility, financial administration, marketing techniques, negotiating techniques, service to customers and others.

From various learning activities in the Production Unit can be obtained the skills, knowledge, and direct experience that is beneficial for the development of students. The real learning experience can increase various skills knowledge, among others, the ability to sell, communication techniques, producing skills, analyzing business opportunities, designing products, planning business, calculating or taking risks, and so on. In addition, students learn about honesty, tenacity, independence, respect for time, respect for people, thorough, responsible and various other entrepreneurial traits.

The Production Unit as a source of funding is one way to maximize one of the potential possessed by the school. Through the Production Unit container, all student creativity and the results of the students' competence can have economic value that is useful to improve the welfare of all school residents.

3.2 Product Test Results

The trial of the effectiveness of the model is intended to test the level of effectiveness of the model in its use. The target of the trial was chosen based on respondents who had expertise in the field of application of the management model of the SMK Production Unit for Business and Management Expertise. The trial of the effectiveness of the model used a questionnaire containing the opinions / perceptions of respondents on the effectiveness of the proposed
model. Because this model has not been implemented for actual implementation, it is called internal effectiveness.

The trial was conducted 2 (two) times involving 90 respondents consisting of 40 respondents in the limited trial I, 20 people majoring in Accounting, and 20 people majoring in Office Administration. Furthermore, the number of respondents was expanded to 50 respondents in the second limited trial; 25 people majoring in Marketing, and 25 people majoring in Banking.

First trial. In the limited trial I was intended to see the feasibility of implementing a Production Unit management model developed by researchers, by managers to be used in the implementation of Production Units for students majoring in Accounting and Office Administration. This trial was conducted to distribute questionnaires to 40 respondents consisting of 25 questions by focusing on 4 (four) main variables, namely; 1) planning, 2) organizing, 3) implementation, and 4) supervision. The results of the analysis of data collected from the trials can be reported in Table 1.

### Table 1. Limited trial results I in Accounting and Office

<table>
<thead>
<tr>
<th>The variables examined were</th>
<th>Respondent Answer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SL</td>
<td>SR</td>
</tr>
<tr>
<td>Planning Up</td>
<td>36</td>
<td>4</td>
</tr>
<tr>
<td>Organizing Up</td>
<td>35</td>
<td>5</td>
</tr>
<tr>
<td>Implementation Of Up</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Supervision Up</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>11</td>
</tr>
<tr>
<td>Average (%)</td>
<td>93,12%</td>
<td>6,88%</td>
</tr>
</tbody>
</table>

Description (40 respondents)

SL = Always
SR = Frequent
JR = Rarely
TP = Never

From the presentation Table 1 above shows that the Management Unit of the Business and Management Field of Business in Accounting and Office Expertise Competencies has a good level of efficiency. Where based on the results of the distribution of questionnaires collected shows; a) Planning; SL reaches 90%, and the rest SR has a 10% achievement, b) Organizing; SL reaches 87.5%, and the rest is SR at 12.5%, c) Implementation; SL reaches 95%, and the rest is SR at 5%, and d) Supervision, all respondents answer Always (SL) so it reaches 100%. Thus, the average achievement from the results of the first trial was 93.12%.

Second Trial. In the limited trial II was intended to see the feasibility of the implementation of the Production Unit management model developed by researchers, by managers to be used in the implementation of the Production Unit for students majoring in Marketing and Finance. Also test the suitability of the model and test the instruments that have been made. This trial was conducted to distribute questionnaires to 50 respondents as in the previous Trial consisting of 25 questions by focusing on 4 (four) main variables, namely; 1) planning, 2) organizing, 3) implementation, and 4) supervision. The results of the analysis of data collected from the trials can be reported in Table 2.
Table 2. Results of limited trial II in the Department of Marketing and Banking

<table>
<thead>
<tr>
<th>The Variables Examined Were</th>
<th>Respondent Answer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SL</td>
<td>SR</td>
</tr>
<tr>
<td>Planning Up</td>
<td>48</td>
<td>2</td>
</tr>
<tr>
<td>Organizing Up</td>
<td>49</td>
<td>1</td>
</tr>
<tr>
<td>Implementation Of Up</td>
<td>47</td>
<td>3</td>
</tr>
<tr>
<td>Supervision Up</td>
<td>48</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>192</td>
<td>11</td>
</tr>
<tr>
<td>Average (%)</td>
<td>96.00%</td>
<td>4.00%</td>
</tr>
</tbody>
</table>

Source: Data processed by questionnaire

Description (40 respondents)
SL = Always
SR = Frequent
JR = Rarely
TP = Never

From the table Table 2 above shows that the Management Unit of the Marketing and Banking Group's Business and Management Expertise Program management model has a good level of efficiency. Where based on the results of the distribution of questionnaires collected shows; a) Planning; SL reaches 96%, and the rest SR has a 4% achievement, b) Organizing; SL reaches 98%, and the rest SR is 2%, c) Implementation; SL reaches 94%, and the rest SR is at 6%, and d) Supervision, all respondents answer Always (SL) so that it reaches 96%. Thus, the average achievement from the results of the first trial was 96.00%.

3.3 Final Product Study

The development of competency-based competency management models in the SMK Production Unit Business and Management Skills is a Production Unit management model that can be carried out by SMK Negeri 1 Panyabungan so as to maximize the potential of students, teachers, and schools that can improve student competence and generate income generating. The development of competency-based management models in the Production Unit of SMK Negeri 1 Panyabungan Management Business Expertise Field has been tested qualitatively and the results show that this model is quite clear, practical and suitable for the Business Management expertise. The explanation and characteristics of skill competency-based Management Model Development in the Production Unit of SMK Negeri 1 Panyabungan Management Business Field can be seen in Figure 1.

Fig. Final Model of Management of Production Units of SMK Production Unit Components as Learning Resources
4 Conclusion

Based on the research results that have been discussed, and from the results of trials I and II in the field it can be concluded the following results:

a. the Production Unit of Business and Management Competency Skills that need to be developed are: Office Administration, Accounting, Banking, and Marketing.

b. Operational Standards Procedures that are appropriately applied in the Business Management Field in the Production Unit of SMK Negeri 1 Panyabungan, both UP which serves as a learning resource and funding source, consists of 4 main stages, namely: Planning, Organizing, Implementation, and Supervision.

c. Output of Production Unit Management (UP) in SMK Negeri 1 Panyabungan are:

1) Practical planning of production units at SMK Negeri 1 Panyabungan Division of Business and Management is in the very good category with a percentage of (93.00%). This score is obtained from the results of the average trial I (90%) and Trial II (96%).

2) Organization of production units in SMK Negeri 1 Panyabungan Division of Business and Management is in the very good category with a percentage of (92.75%). This score is obtained from the results of the average trial I (87.5) with the Trial Results II (98%).
3) The implementation of production unit practices at SMK Negeri 1 Panyabungan in Business and Management is in the very good category with a percentage of (94.50%). This score is obtained from the results of the average trial I (95%) and Trial Results II (94%).

4) Supervision of production unit practices at State SMK Negeri 1 Panyabungan Business and Management are included in the excellent category with a percentage of (99%). This score is obtained from the results of the average Trial I (100%) and Trial Results II (98%).

References

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