The 3rd International Conference of Science Education in Industrial Revolution 4.0 (3rd ICONSEIR-4.0)

December 21st, 2021, Medan, North Sumatra, Indonesia

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Preface

The 3rd International Conference of Science Education in Industrial Revolution 4.0 (ICONSEIR-4.0) is a forum of scientists, academics, researchers, teachers and observers of education and students of post-graduate who care of education. At this conference they will present the results of research, scientific studies, experience and best practice to be widely shared for the advancement of education. This event was held by the Faculty of Education, Universitas Negeri Medan - Indonesia, on December 21, 2021. The fields of study discussed in this event are: 1) Implementation of critical pedagogy in primary education, 2) The nature of case method and team-based project, 3) Flipped classroom model using digital technology, 4) Career development and employment consulting, 5) Technology and social media in counselling, 6) Fostering HOTS through guidance and counselling program, 7) Integrating innovations in early childhood education, 8) Stimulating children higher order thinking skills through play, 9) Digitalisation in today’s childhood, 10) The utilisation of technological innovation for development of community education, 11) The challenges of community education in the era of society 5.0, 12) The future of e-learning community for community 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, teachers, students of postgraduate program and professionals.

Yusnadi
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Variety of languages on the status of Facebook users
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Investigating Public Speaking Skills in an Online Synchronous Course

Dwi Rahayu1, Francisco Javier Naranjo Escobar2, Purwanti Taman3
{dosen02343@unpam.ac.id}

Universitas Pamulang, Indonesia1, Lakeland University Japan, Japan2

Abstract. This study aims at investigating the application of public speaking skills in online classes based on class observations and students’ perception on their experiences. Using the Exploratory Sequential Mixed Design coupled with Thematic Analysis, 67 university students participated in this study. The observations show that the areas of public speaking: physical, content, and visual are the salient elements in the class activities. The survey indicates that the participants felt less anxious to present online because it was on camera, however, due to the limited screen view, physical messages were more meaningful offline. Secondly, they found no difference between the content of online and offline presentations. Lastly, visual aspects are regarded as ‘most useful’, and ‘most powerful’ in the online presentation pertinently for gripping attention. In reference to the predominant role, online public speaking courses should cover the area of visual message comprehensively.

Keywords: content, online, public speaking, physical, visual

1 Introduction

Public speaking skills are undoubtedly crucial for university students to prepare them to become professional speakers. Public speaking courses are usually construed as programs that provide students with skills (Lucas, 1999) supported by ELT, particularly to promote careful listening, critical thinking, careful delivery of information, coherence, and routines, to lead natural communication (Iberri-Shea, 2009; Leopold, 2016). The authenticity and reflection of the target language (Buendgens-Kosten, 2014; Siegel, 2014) should enable the speaker to convey a message as realistic as possible. However, student-related factors such as shyness, nervousness, fear of speaking, not confident to speak, and fear of making mistakes (Moulida, 2019) and motivational aspects may cause the oral assessments to be anxious and stressful (Nash et al., 2016). The nervousness could be recognized in a form of unstable breathing, intonation, sweat, and blur vision (Taman, 2020).

The exponential growth of online teaching through the incorporation of ODE (Online Distance Education) into the education programmed by most universities means a broader offer of online education for students (He et al., 2020). Evidence shows that students attending either hybrid classes, a mix of online and live classes or exclusively online delivered ones did not
show differences in terms of public speech performance (Clark & Jones, 2001). Another study also claimed that there were no significant differences in the amount of anxiety between delivering a traditional face-to-face speech and a speech given using web-conferencing technology (Campbell & Larson, 2013), and that the advent of online education has made it possible for students with busy lives and limited flexibility to obtain a quality education. Time and venue flexibility (Miller 2010), as well as course fees affordability leads to the increasing number of students’ enrolment (Tichavsky et al., 2015) of online courses. Web-based instruction has made it possible to offer classes worldwide through a single Internet connection (Paul & Jefferson, 2019).

However, educational institutions need to recognize that merely offering students courses in an online format is not the same as preparing students to offer presentations to a web-based audience. To seek better effectiveness, the pedagogical medium of academic institutions should redesign the way they want to deliver their course content (Paul & Jefferson, 2019). The transformation of course content from offline into online platform, time management and workload, technology challenges, student motivation, communication with students online, obtainability of appropriate institutional support, motivation support (Vanhorn et al. 2008), followed by requirement of greater personal discipline and motivation (Miller, 2010), have been a considerable challenge regarding the effectiveness on online classes. Universities and colleges demand fundamental preparation of online teaching and learning activities. Challenges such as high dropout rate (Bawa, 2016) began to worsen particularly for university students below the age of 24 (Wladis et al. 2015). This is known to be caused by lacking face to face interaction with classmates and lectures, and insufficient direct social interactivity (Miller, 2010).

A study recommends physical message application (Harrington & LeBeau, 2013) to augment participants’ online engagement and to create more interactive online presence (Tichavsky et al., 2015). Although numerous language skills said to be effectively developed in an online format (Ward, 2016), namely active listening (Cheon & Grant, 2009), negotiation (Cockburn & Carver, 2007), music performance (Pike & Shoemaker, 2015), and clinical social work (Wilke et al., 2016), there are limited studies which explore the quality of public speaking performance conducted online versus offline classes (Clark & Jones, 2001). One even stated that there is no study to date evaluating the effectiveness of public speaking delivered online versus offline (Broeckelman et al., 2019). Due to the difficulties and hesitations arising from online public speaking, a study recommended reconsidering conducting a Public Speaking Course online (Wibowo & Khairunas, 2020).

By their very nature, public-speaking courses depend on interactions between speakers and audiences (Nicolini & Cole, 2020). Therefore, any L2 public speaking classroom may potentially show similar factors inherent to L2 development, such as interlanguage and interlanguage pragmatic development. The aforementioned factors are crucial because adults tend to spontaneously use unmastered language to express their ideas (Tarone, 2018) despite a lack of pragmatic mastery (see Bardovi-Harlig, 2013; Leopold, 2016 for relevant discussions). However, following Morreale et al., (2019) we believe that more than barriers, these aspects are design-focused factors to consider when designing online public speaking classes.

Therefore, while considering that faculty and students find face-to-face instruction preferable (see Koenig, 2019), any online public speaking intervention should consider practical constraints. We back up this following Broeckelman et al., (2019), who found no significant differences in terms of quality between traditional and online delivery of this sort of class. Likewise, recent research has mainly focused on exploring explicit aspects of the instructional experience, such as peer feedback (see Nicolini & Cole, 2020) and how participants feel when the context has forced online instruction (see Ratcliff, 2021).
The teaching of public speaking and its research

To date, many sources have explored public speaking; however, the majority has focused on student-related factors present in face-to-face settings, such as self-perception (Grieve et al., 2021; Pierini, 2020). Other students have explored the nature of public speaking itself (see Tsizhmovska & Martyushev, 2021). Therefore, although online delivery constitutes standard practice in public speaking teaching (see Morreale et al., 2019), the study of this delivery method remains neglected. It is believed that online public speaking teaching entails—at least theoretically—the same challenges any L2 language course has, such as speech content, usage, forms-related constraints (Bardovi-Harlig, 2019), and linguistic development (Tarone, 2018). As such, we argue that online classroom is no different from a traditional one from a developmental perspective. We support this rationale following Wu’s (2015) study, which found no significant difference in effectiveness between online and traditional instruction.

As for traditionally delivered public speaking, attitudinal aspects seem prevalent among students; instruction and coping strategies, in turn, seem to remediate issues (Lusianawaty & Masful, 2021; Pierini, 2020; Grieve et al., 2021). Notably, communication apprehension or anxiety seem to improve when the lecturer actively engages in coping mechanisms—a process akin to scaffolding with demonstrated success (Whitworth & Cochran, 1996; Al-Tamini, 2014). Moreover, instruction seems to palliate communication apprehension issues, such as student nervousness, eye contact, gestures, and comfortable speaking in front of an audience (Al-Tamini, 2014). Interestingly, though, women showed higher levels of fear of public speaking at the college level (Marinho et al., 2015), while Paradewari’s (2017) findings suggest that the classroom atmosphere impacts perceived negative perception, ability, self-assessment, and anxiety. These results are believed to arise from self-efficacy and self-perception while performing public speaking tasks.

Along similar lines, Alhabbash (2012) stated there is evidence on the effectiveness of instructed delivery. This author argues that learners are more likely to master public speaking skills via instruction. Alhabbash’s (2012) findings resonate with SLA principles in that reduced stress optimizes cognitive resources use. This author also argues that offering models—skills and knowledge to carry out communication—seems to impact public speaking performance. Others like Raja (2017), claim that practicing and rehearsing before a presentation or speech may provide a level of command and reduce anxiety. According to Raja (2017), when lecturers sympathize with students, their anxiety levels decrease while preparation and reassurance from the audience contribute to better performance.

However, despite the valuable insights from traditionally delivered-focused endeavors, online-delivery focused research has primarily dealt with students’ reaction to online content delivery (see Campbell & Larson, 2013; Hasibuan et al., 2021; Kinash, 2021; Moulida, 2019) and while valuable, it does little to clarify operational factors at play in the design of online-delivered courses—a contradiction given the acknowledged frequency of online delivery for this course type (Morreale et al., 2019, p.77). Finally, and although only related to feedback, online teaching seems to offer benefits to students from the standpoint of access to more written feedback and reduced levels of intimidation (see Nicolini & Cole, 2020). The same may be argued from online public speaking classes, but assumptions are nothing but claims without data.

At the moment, there are many tools available, such as Google Classroom, Zoom, Google Meets, or Teams. However, Zoom is nominated to be one of the most popular applications across countries due to its interaction-promoting features, ease of use, and laptop or smartphone-based operation (Baron, 2020). Exploring whether or not Zoom is adequate for online public speaking, despite its current widespread use deserves attention given the urgent need to remain
compliant and accountable even during the pandemic (see Hardy & Melville, 2019 for a discussion on these matters).

**Online lessons and curricular considerations**

Until the COVID-19 pandemic, online education was part of the available delivery options. The pandemic put educational systems worldwide under considerable pressure, as venues had to transition from traditional or blended classrooms to virtual classrooms. Also, the pervasive belief that online-delivered education is inferior to traditionally delivered classes (Kyodo, 2021) added even more pressure, although there is no evidence supporting this assumption (Wu, 2015) and while online education is expected to increase in the future (Castro & Tumibay, 2019).

However, the current quick transition certainly seems to contradict the literature in terms of careful implementation and consideration of stakeholders (Chambers & Bax, 2006; Gruba et al., 2016), constant improvement of teaching practice (Kiely & Rea-Dickins, 2005; Norris, 2009, 2016; Rea-Dickins & Germaine, 1992), and avoidance purely accountability-driven endeavors due to the potential washback (Koretz & Hamilton, 2006; Koretz, 2008; Slomp et al., 2020; Smith & Holloway, 2020; Skedsmo & Huber, 2021). The aforementioned aspects deserve attention because of the effect accountability has as an improvement-driving factor (see Norris, 2016; Lumino & Gambardella, 2020; Picciotto, 2013) and because online teaching should respond to good-practice design principles found in the literature (Chambers & Bax, 2006; Jones, 2007; Gruba & Hinkelman, 2012; Gruba et al., 2016) as they foster a virtuous cycle.

Up to before the pandemic and emergency online teaching, the formats in online distance education—ODE—were synchronous and asynchronous. Asynchronous distance education (ADE) may well be pre-recorded lectures or the use of tools, such as Moodle. Conversely, synchronous distance education (SDE) entails the simulation of traditional education communicative models to a certain extent synchronizing teaching and learning mimicking classroom interaction (see He et al., 2020). Regardless of the approach, SDE and traditional delivery have not shown any differences other than increased satisfaction in the case of SDE (He et al., 2020; Wu, 2015).

These SDE-related findings deserve attention because public speaking research has found that eliciting students’ perceptions, emotions, and experiences before and after the activities triggered increased levels of satisfaction and lower levels of fear, indecision, and confusion (Nash et al., 2016). The positive outcomes listed earlier may well be present in the case of SDE-type online public speaking classes and be used to justify future online public speaking initiatives from a standpoint checking the alignment of teaching methods, expectations, and in-class experience (see Koretz & Hamilton, 2006, p. 555 for a similar discussion) while keeping stakeholders’ needs visible (Barnes et al, 2000; Kenna & Russell, 2015; Pinto, 2016).

The effectiveness of online classes can be evaluated from the curricular alignment and accountability (Norris, 2016) and that basically seeks to demonstrate the value of the program. Referring to how participants feel with regards to the learning process to gain a deeper understanding and more meaningful experience and effective learning, which is a crucial component in evaluative literature (Kiely & Rea-Dickins, 2005; Norris, 2009, 2016; Rea-Dickins & Germaine, 1992). A study by Rice & Leonard, (2017) stated that the most successful method for teaching or learning public speaking is the mixture of instruction, imitation, and practice. This study focuses on examining the application/practice of the skills in measuring the effectiveness of skills in an online instruction setting. This study, therefore, aims at answering the following questions:

a. What public speaking areas are taught in the online classes?

b. What is the respondents’ perception of their learning experience in applying the public speaking skills areas taught in the online classes?
c. What do the respondents perceive about the online presentation compared to the offline?

2 Research Methods

This research used the exploratory sequential mixed design (Cresswell & Clark, 2018). With this method, both qualitative and quantitative approaches of data collections were applied while considering the richness of the site. In the first phase, in order to find the lessons taught in the subject of public speaking, the data were gathered from documents of syllabus, books and the power point presentations used in the classrooms. Secondly, observations to the class were conducted to find out the classroom activities.

Lastly, to gather information on how the respondents conceive their learning experience, a survey in which questions were generated from the documents and observations was distributed. Creswell (2012, 2014) suggests surveys to elicit opinions, attitudes, emotions, beliefs, perception, and behaviour from the respondents. However, since surveys may suffer from potential self-reporting issues, the analysis is complemented with open-ended questions which were part of the survey. Those questions were analyzed using Thematic Analysis (Braun & Clarke, 2006).

![Figure 1. Exploratory Sequential Mixed Design (Cresswell, 2014)](image)

Thematic Analysis (Braun & Clarke, 2006, 2012) outlines six phases of analysis: familiarizing the data, generating initial codes, searching for themes, reviewing potential themes, defining and naming themes, and producing the report. The bottom-up approach is used in this data analysis where codes and themes are generated from what is in the data, rather than the top-down approach that generates the codes and themes based on a certain concept.

3 Results and Discussion

The results from class observation yield on two aspects: the documents of teaching such as syllabus, textbook, PowerPoint presentations used in the classroom and the learning activities. The documents show mainly Harrington and LeBeau’s (2013) that focuses on these areas of public speaking skills: 1) Physical message: comprises the use of posture, gestures, eye contact and voice inflection. 2) Visual message: chart and graphs, pictures, fonts, colors on the presentation slides, and other additional visual aids such as videos. 3) Story message: stages of speech (introduction, content, conclusion), structure of informative and persuasive speech, IEE (introduction, Explain, emphasize) to describe data on graphs and charts.

Whereas the class activities were about practicing those three areas of public speaking skills. Students were given the opportunity to rehearse, apply the skills and have the feedback given by the lecturer (Figure 3). Students practiced using their hands to show gestures and to adjust the position for the gestures to be seen on the camera. In addition, the use of voice inflection to stress, stretch, or pause their utterances were used to emphasize the points of message in their
presentation. The lesson of structuring content in the speech showed students follow the structure of IEE (introduction, explain, emphasize) to explain the charts on the slides. Lastly, students also practiced choosing colors, images and fonts for their slides. Rice & Leonard (2017), Whitworth & Cochran (1996), Norris (2009, 2016), and Al-Tamini (2014) highlighted the importance of students' interaction, involvement, and peer influence through instruction, imitation, and practice for the most successful method in learning.

Similarly, in this study, the observation has found more students became more confident in practicing the skills of public speaking after seeing their teacher and classmates' examples. It is surprising that this has similar fundamental touch of theory of learning from the Sociocultural perspective. This is in line with Rahayu (2020) that stated the sociocultural theory underlies studies on classroom interaction, in this case, including the online context.

Fig. 2. Class capture: practicing visual and physical skills

The respondents’ perception of their learning experiences

The findings in this part are divided into sections based on the previous findings in part 1 about the materials the respondents learn in the online course. The first is the physical message, the respondent’s perception of their learning experience is almost homogeneous. Around 50% of respondents found that physical messages could be seen and experienced but were sometimes interrupted by the internet signal (see table 1). The intensity of the interruption is more or less equal with the interruption that hinder the clarity of the online presentation.

Table 1. Respondents’ perception of Physical Message

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
<th>Sometimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you think that you could see the posture of the presenter clearly on the screen?</td>
<td>44%</td>
<td>5%</td>
<td>51%</td>
</tr>
<tr>
<td>Did you think that you could have eye contact with the presenters?</td>
<td>51%</td>
<td>16%</td>
<td>34%</td>
</tr>
<tr>
<td>Did you think that you can see the presenters' gestures in their presentations?</td>
<td>43%</td>
<td>3.5%</td>
<td>55%</td>
</tr>
</tbody>
</table>
Could you have a good interaction with your audience or with the presenter? 48% 16% 34%

Could you hear the presenters’ voice inflection clearly? 63% 0% 37%

Did you feel more anxious in performing the physical message? 41% 26% 34%

In contrast with the physical message, according to 60–88% of respondents, visual messages are found as clearly shown (88%) and become more powerful in the online presentation. This is the part of public speaking skills that is presented more clearly, compared to the other skills. In addition, the respondents could use the Zoom features at ease (76%) so that the visuals presented were clear.

### Table 2. Respondents’ perception of Visual Message

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
<th>Sometimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Could you see the presenters’ slides clearly?</td>
<td>88%</td>
<td>0%</td>
<td>12%</td>
</tr>
<tr>
<td>Could you use the zoom features to show your visuals?</td>
<td>76%</td>
<td>0%</td>
<td>24%</td>
</tr>
<tr>
<td>Did you think that your visuals became more powerful?</td>
<td>60%</td>
<td>13%</td>
<td>27%</td>
</tr>
</tbody>
</table>

Lastly, the story message or the content of the presentation was perceived as equally understood and clearly presented both online and offline. This means there is almost no difference on how the content of a presentation was structured online and offline.

### Table 3. Respondents’ perception of Story Message

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
<th>Sometimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you think that you could understand the messages delivered by the presenters?</td>
<td>65%</td>
<td>2%</td>
<td>33%</td>
</tr>
<tr>
<td>Did you think that the presenters had structured their presentation well enough?</td>
<td>53%</td>
<td>5%</td>
<td>41%</td>
</tr>
<tr>
<td>Did you think that the content of the body message and the evidence were clearly stated by the presenters?</td>
<td>56%</td>
<td>1%</td>
<td>42%</td>
</tr>
</tbody>
</table>
Did you think that delivering a message became more complicated?

Comparisons to the offline classes

Table 5 shows the points of differences on how physical messages are presented in synchronous and asynchronous settings. The first point that is different is shown as the ‘interaction’ theme, which codes are varied around the view of the screen, which is small compared to the offline setting, gestures that cannot be clearly seen and eye contact which seems indirect when it is conducted online.

However, in contrast to negative comments on the view, most respondents admitted that they were less anxious and felt more confidence during the online presentation because the audience were on camera. A similar study resulted in the same finding that in online classroom context the feelings of intimidation are reduced (Nicolini & Cole, 2020). Raja (2017) also found that a virtual environment could bring up confidence to face audiences. Offline presentations are more stressful as what the respondents stated ‘more pressure offline’ and in contrast with the online presentations as ‘no emotion’. Overall, the general comment is that physical messages are more effective when the presentation is offline.

Table 4. Physical Message Online Versus Offline

<table>
<thead>
<tr>
<th>Codes</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>hard to see on camera</td>
<td>unclear</td>
</tr>
<tr>
<td>limited gestures online</td>
<td></td>
</tr>
<tr>
<td>gestures are not on limited frame</td>
<td>Interaction</td>
</tr>
<tr>
<td>hard to see on zoom</td>
<td></td>
</tr>
<tr>
<td>half body view online</td>
<td></td>
</tr>
<tr>
<td>all gestures seen offline</td>
<td></td>
</tr>
<tr>
<td>gestures cut by the camera</td>
<td></td>
</tr>
<tr>
<td>offline gestures are clearer</td>
<td></td>
</tr>
<tr>
<td>full body offline</td>
<td></td>
</tr>
<tr>
<td>hard to engage online</td>
<td></td>
</tr>
<tr>
<td>real eye contact offline</td>
<td></td>
</tr>
<tr>
<td>physical message is clearer offline</td>
<td></td>
</tr>
<tr>
<td>captured better offline/offline gestures are effective</td>
<td></td>
</tr>
<tr>
<td>more effective offline</td>
<td></td>
</tr>
<tr>
<td>expose to pressure offline</td>
<td>less</td>
</tr>
<tr>
<td>more confident online</td>
<td>anxiety</td>
</tr>
<tr>
<td>no emotion online</td>
<td></td>
</tr>
<tr>
<td>more pressure offline</td>
<td></td>
</tr>
<tr>
<td>impossible to pay attention to the class</td>
<td></td>
</tr>
<tr>
<td>no emotion in online delivery</td>
<td></td>
</tr>
</tbody>
</table>
In contrast with physical messages, most respondents stated that they relied on visual messages during the online presentation. Mostly, they agreed that visuals have a prominent role in online presentations with most common comments on visuals as ‘crucial’, ‘important’, ‘more useful’, and ‘powerful’. Therefore, they admitted that preparation on creating visuals was done more seriously because of its importance in online presentations. On the screen, when having online presentations, even when there is a signal problem, the visuals could still be shown and seen clearly. In comparison to physical messages, visuals are less affected by signal problems.

<table>
<thead>
<tr>
<th>Codes</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>online visual is clearer</td>
<td>Clearer online visual</td>
</tr>
<tr>
<td>PPT is clear</td>
<td></td>
</tr>
<tr>
<td>presentations are bigger</td>
<td></td>
</tr>
<tr>
<td>online visual is easy to understand</td>
<td></td>
</tr>
<tr>
<td>online graphs can be seen clearly</td>
<td></td>
</tr>
<tr>
<td>online visual can be seen wholly</td>
<td></td>
</tr>
<tr>
<td>online PowerPoint is more useful</td>
<td>Importance of online visual</td>
</tr>
<tr>
<td>online visual is more powerful</td>
<td></td>
</tr>
<tr>
<td>online visual is important</td>
<td></td>
</tr>
<tr>
<td>online visual is crucial</td>
<td></td>
</tr>
<tr>
<td>efforts in creating slides</td>
<td></td>
</tr>
<tr>
<td>can be delivered similarly</td>
<td>no difference</td>
</tr>
<tr>
<td>shared screen to replace projector</td>
<td></td>
</tr>
<tr>
<td>both are important</td>
<td></td>
</tr>
<tr>
<td>exactly the same</td>
<td></td>
</tr>
<tr>
<td>both are clear</td>
<td></td>
</tr>
<tr>
<td>both can share slides</td>
<td></td>
</tr>
<tr>
<td>can be applied online and offline</td>
<td></td>
</tr>
</tbody>
</table>

When the respondents were asked about the distinguishing factors between online and offline structure of the content of presentation, most of them confirmed that there was no difference (table 6). In both contexts, the content needs to be structured effectively in order of ‘introduction’, ‘main content’, and ‘conclusion’ and the tools used to deliver the content are the same when online and offline. The same result was found by Bardovi-Harlig (2019) in that communication should cover the content of speech and the forms, just like public speaking classes.
<table>
<thead>
<tr>
<th>Codes</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>both use PowerPoint</td>
<td>no difference</td>
</tr>
<tr>
<td>no difference</td>
<td>no difference</td>
</tr>
<tr>
<td>story message must be applied in both</td>
<td>the story message understood</td>
</tr>
<tr>
<td>no different in content</td>
<td>the same</td>
</tr>
<tr>
<td>the story message understood</td>
<td>both can be spoken</td>
</tr>
<tr>
<td>the same</td>
<td>both are explained thoroughly</td>
</tr>
<tr>
<td>both depends on the presenter</td>
<td>both can be spoken</td>
</tr>
<tr>
<td>the same delivery</td>
<td>both are explained thoroughly</td>
</tr>
<tr>
<td>important for both</td>
<td>both depends on the presenter</td>
</tr>
<tr>
<td>the same slides</td>
<td>the same delivery</td>
</tr>
<tr>
<td>the same thing</td>
<td>important for both</td>
</tr>
<tr>
<td>stronger story message when online</td>
<td>online content is well delivered</td>
</tr>
<tr>
<td>online content is well delivered</td>
<td>Online story message</td>
</tr>
</tbody>
</table>

### 4 Conclusion

In this study, the experiences on what public speaking skills are applied and how the students perceived them are emphasized. The qualitative data shows that the lessons are found to be in three areas of physical, visual and content/story message. Those skills become the salient elements of the class activities. Furthermore, differences in all of the physical aspects are found, including gestures and eye contact that seem unreal. From the aspect of the content of the speech, the participants found no significant difference between online and offline courses. However, they assure that the use of visuals is where the primary concerns should be put in online presentations. Having highlighted this, it is paramount that online public speaking courses in the future, blended with technology advancement, should include technical training on how to present visual messages sufficiently and appropriately.

Nevertheless, based on the finding that the minority of respondents claimed to experience internet connection problems in their online classes, this study was not hindered by the issue. More respondents did not find internet connection as a problem. This result is a proponent of Castro & Tumibay (2019) that online education is expected to increase in the future, and this also means less internet problems are expected to be found.

This study, however, has some limitations. It would be beneficial to the findings if the respondents could have been more than 67. Furthermore, as these are of the same classes in the same institution, it would be needed to broaden the participants to the other classes of public speaking in other institutions. With the comparison to the application of the online public speaking courses elsewhere, there could be more findings to what areas of public speaking are practiced in these online learning contexts. Therefore, there could be more and not limited to the physical, visual and content/story message.
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Validation of Educational Comic Integrated Material of Hidrometeorological Disaster to Improve and Knowledge Environmental Care Attitude

Dina Syaflita1, Hesty Marwani Siregar2, Naila Fauza3, Muhammad Arif4
{dina@lecturer.unri.ac.id}

Faculty of Education, Universitas Riau-Indonesia

Abstract. One way to optimize disaster mitigation efforts in the field of education is to provide reading materials related to disasters that usually occur in areas where students live. Comics are fun reading materials for students. To be used as reading material for elementary school students, comic needs to be validated. The purpose of this research is to inform the validation results and what are the validator's suggestions regarding the development of disaster comics for elementary school-aged children. The research instrument used was a validation questionnaire. Validation is carried out on aspects of content, language, graphics, and functionality. The results show that the comics developed are valid. The main suggestions regarding the development of comics for elementary school-aged children are to try to make the characters' faces clear and good-looking, bright colors, and use simple language, create a separate dialogues or monologues to explain the special term.

Keywords: Validation, Comic, Hidrometeorology, Mitigation

1 Introduction

Natural disasters can happen anywhere and anytime. Humans need to have knowledge of the causes, when they occur, the impacts, and signs of an imminent natural disaster. Regarding natural disasters whose causes are mostly caused by human activities, this knowledge is the first form of good disaster mitigation. This knowledge will raise human awareness of the environment. This knowledge needs to be given to children as early as possible. Provision of disaster knowledge can be done through reading materials.

Reading material for children needs attention to several aspects. The way children learn and understand things and their interests is something that needs attention. Therefore, to be able to become a disaster reading material that contains disaster information as a form of mitigation for children, especially elementary school children, these reading materials need to be validated.

Disaster Mitigation Through Education

Natural disaster mitigation is an effort to reduce disaster risk both before, during, and after a disaster occurs. According to [1], disaster mitigation can be done through physical development as well as awareness and capacity building to deal with disasters. In addition, one of the actions in the national disaster management plan for 2020-2024 is to increase the awareness and capacity of the government, private sector and society towards the environment. One of the indicators in this action is the formation of formal education units and institutions or communities that care and are environmentally cultured [2].
According to [3], education is a form of non-physical disaster mitigation. Education as a form of mitigation aims to prepare people to get used to living together with natural disasters. [1] states that formal education such as school is considered an effective forum for developing patterns of thought and behavior. Therefore, schools are very suitable as a place for students to gain understanding related to disasters and develop an attitude of caring for the environment and an attitude of being responsive and resilient to disasters. Integration of natural disaster mitigation materials into learning is a step that can be taken to provide disaster knowledge from an early age so that it gives birth to a young generation who is aware and responsive to disasters [4]. Disasters that are integrated should be disasters that often occur in the area where students live, such as in the Riau area, disasters that often occur are hydrometeorological disasters.

**Comics As Reading Material For Disaster Education**

Natural disaster mitigation comics are comics that contain disaster information with the aim of providing knowledge and fostering an attitude of caring for the environment to readers. Educational comics containing natural disaster material can help students prepare for disasters [5]. The material in comics is packaged in an attractive and educational form so that it is easy for readers to understand. Reading materials in learning can be supplements (additional), complement (complementary), and substitution (substitute). Reading materials are supplemental if students have the freedom to use them or not, are complementary if the reading materials aim to complement the subject matter that has been taught in class and are substitutes for choosing the desired learning and increasing learning flexibility [6], [7]. Disaster education comics as reading material for learning can function as supplements, complements, or substitutions.

[8] suggests that comics are pictures that tell stories and convey messages verbally and non-verbally, verbally through text and non-verbally through pictures. The ability to harmonize messages and images is needed to create a good comic. The steps for making a comic consist of determining the topic, determining the storyline, developing the character, preparing the background story, making a comic storyline if needed, preparing a visual storyboard script, and starting to finish the comic. There are several types of comics, namely comic strips that only involve one focus of discussion, comic books where one book presents a complete story, and website comics. Because hydrometeorological disasters that usually occur in Riau province consist of several disasters, the most suitable type of comic is comic strip.

Educational comics can be used as good reading material if they meet several criteria, one of which is valid for use. The objectives of this study are 1) to describe the validation results of hydrometeorological disaster mitigation comics in the Riau province, and 2) to convey validator's suggestions in improving educational comics.

## 2 Research Methods

The type of this research is R&D. The procedures used are 1) preliminary studies needed to obtain useful data for developing comics; 2) Drafting comics and instruments; 3) Validation; 4) Implementation; and 5) final revision. In particular, this research describes the results of validation by experts. This research was conducted in July - September 2021. This research describes the results of expert validation and suggestions in improving comics as disaster mitigation reading material for elementary school students, and shows the results of revisions before and after repairs according to expert advice.
The instrument used is a validation questionnaire filled out by 4 validators. The comic validators are the lecturers as experts in the fields of geography, earth physics, environmental science, and elementary education. Aspects assessed in this validation are content, language, graphics, and disaster mitigation functions validation. The analysis technique used is qualitative and quantitative analysis. Qualitative analysis is for validator’s suggestions, while quantitative analysis is for data analysis of validation test results by experts. The level of validation is determined by the criteria for determining the validation that shown in Table 1.

3 Result and Discussion

The validated aspects include content validation, language, graphics, and disaster mitigation functions in comics. The validator of disaster material education comics consists of four experts, namely 1 expert in geography, 1 expert in earth physics, and 2 experts in basic education. The content or material validation aspect consists of six indicators. The average content validation score was 94.64 (very valid without revision). The graph of the content validation results can be seen in Figure 2.

![Content Validity](image)

**Fig.1. Content Validity**

The material aspects presented and their relation to the disaster were stated to be very valid. The most frequent disasters that occur in Riau province are floods and forest fires, but there are two other disasters that are also common in this province, namely hurricanes and landslides. The contents of the comic’s present disaster knowledge and moral messages related to environmental care. All disasters are given knowledge regarding the causes and mitigation of these disasters. Comics are presented in various storylines but still prioritize the truth of science for the reader.

Disaster mitigation using comics is a simulation effort with the aim of forming the concept of disaster in the minds of students so that they can live side by side with disasters, especially people in disaster-prone areas [3]. The contents of disaster materials summarized in the disaster mitigation pocketbook compiled by [2] generally consist of information on the causes of disasters, when disasters occur, the impact of disasters, and efforts to reduce the impact of disasters before, during, and after the disaster occurs. The hydrometeorological disaster material developed at least has this information in it, either delivered directly or in the actions of figures. An example of the integration of important information in the developed hydrometeorological disaster material is shown in Figure 2.
Fig. 2. Disaster Information on Comics with (a) flood, (b) hurricanes, and (c) landslides themes
Each comic storyline is inserted with information about disasters such as the causes, when the disaster occurs, the impact of the disaster and disaster mitigation efforts. The information conveyed can be in the form of dialogues or monologues. To clarify the delivery of disaster messages, disaster stories in comics are also assisted with disaster illustrations.

The language aspect carried out is related to the assessment of whether the language used is suitable for reading for elementary school students or not, whether the language is communicative, the consistency of the use of terms, the information is easy to digest and the storyline is easy to understand. The results of the validation of the language aspect are shown in Figure 3.

![Figure 3: Language Validity of Disaster Comic Developed](image)

**Fig.3. Language Validity of Disaster Comic Developed**

Linguistically, the comics developed are suitable for reading for elementary school students, the language used is communicative, the information conveyed is clear, the storyline is easy to understand and consistent in using terms so that students do not feel confused in understanding some terms that are not familiar to them. Based on the validation results, it was found that the hydrometeorological disaster education comics were linguistically valid with an average validation value of 85, which means they are valid with several revisions. The suggestion put forward by the validator is to explain that unfamiliar terms can be explained through dialogue or monologue in the comic.

Comics are basically a medium for conveying information using a combination of words and colors. Comics can break down complex information into simple and easily digestible information. In addition, comics can also rearrange the information to be more meaningful [10]. The language aspect affects the absorption of information by the reader because this aspect relates to the way the writer conveys it to the reader. A simple storyline but able to explain disaster well will make it easier for students to read and absorb information [11]. In essence, an interesting storyline is arranged in simple, clear, and straightforward language [12] but not too standard [13].

The next aspect that is assessed in the validation is the graphic aspect. This aspect assesses the aesthetics of the comic. The results of the graphic validation test of the developed hydrometeorological disaster education comic are shown in Figure 4.
Aesthetically, education comics of hydrometeorological disaster are declared valid. The illustrations, layout and color composition are attractive. In addition, the image size is also proportional. The average graphical validation of the hydrometeorological disaster education comics developed is 90, which means it is very valid without revision. The validator's suggestion regarding graphics is that the colors in comics are generally made bright because elementary school students tend to like bright colors.

Bright colors will give a warm and pleasant impression [13]. One of the layouts commonly used in comics is a geometric layout, which is a layout with line drawings or geometric shapes [14] and the disaster comics developed using a geometric layout. According to [14], layout serves to place panels and text balloons. Text balloons are well placed so they don't get in the way of important visual objects. Regarding the revision of the comic that was developed according to the validator's suggestions, transformation the education comic of hydrometeorological disaster in the Riau province before and after the revision are shown in Figure 5.
The next aspect that is assessed in the validation is the aspect of the comic's mitigation function. The results of the validation of the comic's functionality are shown in Figure 6.

![Fig.6. Functionality of Comic Developed](image)

The validation of the developed hydrometeorological disaster educational comics can be used as a source of reading disaster material, attracts reading interest, entertains and increases knowledge, and is suitable for disaster mitigation. The results of the functional validation of the developed comics show that the comics are very valid with an average score of 93.75. The results of research by [3] show that cartoon comics integrated into science learning can improve recognizing and dealing with disasters. The results of [15] show that comics as additional reading material can increase student's knowledge regarding natural and non-natural disasters and disaster management procedures.

The validation carried out gave the result that educational comics for hydrometeorological disaster material were suitable for disaster reading material and could function as one of the media for disaster mitigation. The contents of the comics developed are very in line with the contents of the disaster material and aspects of disasters in the Riau area. In terms of language and graphics, the comics developed have good graphics and clear language with easy-to-understand storylines. Related to local disasters that are raised in disaster comics, the results of research conducted by [16] show that local disaster integrated mitigation comics are appropriate to be used as supporting media in studying disaster.

4 Conclusion

The validation aims to ensure that the aspects contained in the hydrometeorological disaster comics are in accordance with what they should be. In general, hydrometeorological disaster education comics in Riau province are in very valid criteria for very valid aspects without revision for aspects of content/material, linguistic, graphic, and mitigation functions. The language aspect that needs to be added is that if there is a specific term, it should be explained through a separate dialogue or monologue.

The content or material contained in educational comics should at least contain the causes of disasters, when disasters occur, their impacts, and their mitigation. The language used in comics is recommended to use simple, clear and straightforward language but not rigid so that the storyline in the comics becomes fun and information can be absorbed properly. Coloring in comics should be chosen bright colors.
Acknowledgment

The author gives a very deep appreciation to the Directorate of Resources Director General of Higher Education, Rector and LPPM Undiksha for his trust has funded our research, hopefully, can provide a positive experience and knowledge related to our study of local wisdom Subak concept.

References

The Development of Extracurricular Activities Models based on Multiple Intelligence in Senior High School

Hendri Putra\textsuperscript{1}, Zainuddin\textsuperscript{2}, Darwin\textsuperscript{3}
\{hendriputra2378@gmail.com\}
\textsuperscript{123}Pascasarjana, Universitas Negeri Medan, Indonesia

Abstract. This study aims to produce a model of extracurricular activities based on multiple intelligences for high school students. The method used in this research is Research and Development with the following steps: preliminary research and collecting information, planning, initial product development, Phase I field testing. The research resulted in a model of extracurricular activities based on multiple intelligences as indicated by the assessment of Guidance and Counseling Teachers an average value of 3.9 (very suitable). Assessment of Senior Teachers an average score of 3.7 (very suitable). Assessment of Headmaster an average of 3.7 and Assessment of Supervisors an average of 3.8 (very suitable). So it can be concluded that the development of extracurricular activities models based on multiple intelligences is very feasible to be used in high school.

Keywords: Extracurricular, Based on Multiple Intelligences.

1 Introduction

Education is one of the efforts to develop human potential. Education also plays a role in forming intelligent and quality human beings. In order to educate the life of the nation, National Education functions to develop capabilities, shape the character and civilization of a dignified nation. The purpose of national education is to develop the potential of students to become individuals who believe, fear God, have noble character, are physically healthy, knowledgeable, capable, creative, independent, so that they can become democratic and responsible citizens \cite{1}.

The implementation of education in Indonesia should refer to the national education goals. Education that is developed should pay attention to the diversity of potentials possessed by individuals. The diversity of students' self-potential is based on multiple intelligences. The current reality, it is still found that the learning process is less able to explore the potential possessed by students.

This happens because of a lack of understanding of the concept of multiple intelligences. It takes a creative teacher to be able to implement it in learning. Outdoor learning accompanied by competent and creative teachers will motivate students to develop their respective potentials \cite{2}. Many extracurricular activities are also carried out in outdoor learning. The functions and meanings of extracurricular activities in supporting the achievement of educational goals are numerous. This will be realized when the management of extracurricular activities is carried out as well as possible, especially student arrangements, as well as increasing student discipline and all officers. Good management of extracurricular activities will improve the quality of schools \cite{3}.

Extracurricular activities carried out in schools are very beneficial for students, the community, and the school. Schools can become more famous and popular and can even be
used as a place of promotion to the public. Schools that prioritize extracurricular activities to raise achievement have a special attraction for the community [4].

This study aims to produce a model design for extracurricular activities based on multiple intelligences at Senior High School.

2 Research Method

This research method uses a research development model to produce a product model of extracurricular activities based on multiple intelligences. Development research is used to explain research activities related to method discovery, product discovery as an effort to meet needs [5]. The stages in research using the Research and Development method include: research and information gathering, planning, initial product form, preliminary field test, main product revision, main field test, operational product revision, operational field test, final product revision, dissemination and implementation. The aim is to get the results of this study to have high validity. Sources of data to validate the extracurricular Activity Model based on multiple Intelligence are: 5 instructor of guidance and counseling, 5 Senior Teachers, 3 headmasters, 3 Supervisors.

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3. Results and Discussion

The process of developing Extracurricular Activity based on Multiple Intelligence is carried out in stages, starting from Research & Information Collecting to product validation. The Extracurricular Activity Model based on Multiple Intelligence Design consists of ten components that form the basis for student interaction activities at school.

![Fig1. Extracurricular Activity Model based on multiple Intelligence](image)
The validity test of extracurricular activities was carried out by 5 guidance and counseling teachers, 5 senior teachers, 3 headmasters and 2 supervisors.

### Table 2. Assessment of guidance and counseling teacher

<table>
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Assessment of guidance and counseling teacher about extracurricular Activity Model based on multiple Intelligence as follows: the results of the assessment of 5 teachers of guidance and counseling instructors an average rating of 3.9 (90%), stated that the design of extracurricular activity model based on the multiple intelligence was very appropriate.

### Table 3. Assessment of Senior teacher

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</table>

Assessment of senior teacher about extracurricular Activity Model based on multiple Intelligence as follows: the results of the assessment of 5 senior teachers an average rating of 3.7 (90%), stated that the design of extracurricular activity model based on the multiple intelligence was very appropriate.

### Table 4. Assessment of Headmasters

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Assessment of headmasters about extracurricular Activity Model based on multiple Intelligence as follows: the results of the assessment of 3 Headmasters an average rating of 3.7 (90%), stated that the design of extracurricular activity model based on the multiple intelligence was very appropriate.

### Table 5. Assessment of Supervisor

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</tbody>
</table>
2 Organizing 4 4 4 12 4 very suitable
3 Actuating 4 3 4 11 3.6 very suitable
4 Controlling 3 4 4 11 3.6 very suitable

Total: 3.7
Percentage 90% very suitable

Assessment of Supervisor about extracurricular Activity Model based on multiple Intelligence as follows: the results of the assessment of 3 Supervisor an average rating of 3.8 (90%), stated that the design of extracurricular activity model based on the multiple intelligence was very appropriate.

4 Conclusion

In conclusion, this study designs the development of extracurricular activities based on multiple intelligences. The average teacher of guidance and counseling assessment is 3.9 (90%). The average senior teacher assessment is 3.7 (90%). The average Headmasters assessment is 3.7 (90%). The average supervisor assessment is 3.8 (90%). The results of all assessments on the design of extracurricular activity model based on multiple intelligences an average of 3.8 (90%). Through research, it is known that the design of the multiple intelligence-based extracurricular activity model is feasible for preliminary field test. Therefore, it is suggested that this model can be developed in high school.

Acknowledgement.
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References

The Role Of Educational Technology In Learning Innovation For Community Education Development

R. Mursid¹, Abdul Hasan Saragih², and Harun Sitompul³
{mursid.tp@gmail.com}

Educational Technology, Medan State University

Abstract. The development of educational technology is in line with the development of science and dynamic human civilization in line with human needs. Constructing knowledge through community education that is systematically arranged in innovation through the educational curriculum, thus requiring education actors to study more carefully, quickly, efficiently, and competitively. Educational Technology Products have not been used optimally in learning, training and technical guidance are needed and their use in the development of community education. The progress of the world of education cannot be separated from technological advances. Through technological advances that synergize with education can simplify and improve the quality of learning. The use of educational technology for the learning process can make a good contribution to improving the quality of learning through learning innovation. The utilization of ICT can expand access to education services and improve the quality of community education development. Educational technology demands that educators in general education can apply it and facilitate students to solve learning problems and improve their performance with various conditions and circumstances that we always feel quickly. The greatest increase in performance is in the field of education, especially teachers and lecturers, and must be able to make educational changes to improve the quality of public education.

Keywords: educational technology, learning innovation, public education.

1 Introduction

In Indonesia, developing community education is an endeavor to educate individuals outside of the school context to provide literacy skills and general information so that they may stay up with advances and the necessities of life. Since the 1950s, social education, which is akin to public education and non-formal education today, has grown in popularity in Indonesia, particularly among colleges that have been affected by the "Shakai Kyouiku" growth of social education in Japan. Community Education and Social Education in practice in Indonesia are influenced by the notion of community development with the main programs in the scope of public education, social education, or community development [1].

In 1982, Community Education and Social Education in Indonesia has renamed Education Outside School to encompass non-formal and informal education. Out-of-School Education has a similar concept to Community Education and Non-Formal Education, which emerged later. Any structured educational activity that takes place outside of the school system is what it is all about. Basic education, adult education, extended education, and continuing education, on the other hand, have the same purposes as adults: to provide basic information and life skills, as well as continued personal development in both classroom and out-of-school contexts. Non-formal education can be seen from the purpose of education. Regarding the formal education...
system, Sulfemi [2] states that non-formal education is implemented to provide values, knowledge, and skills at an affordable cost and provide an inexpensive alternative to providing the skills needed by the economic system. This educational goal is to be achieved because formal education is seen as failing to fulfill the intended purpose. Arafat [3] emphasizes that non-formal education provides an opportunity to learn productive skills and a way to participate effectively in community development.

In line with the above thought, Hiryanto [4] in the context of understanding adult education explains that the goals of non-formal education are directed at: (1) increasing individual cognitive abilities through providing meaningful knowledge; (2) self-quality development towards a happy and self-actualizing personal achievement (self-fulfillment); (3) enabling individual growth and maintaining a good democratic society; free individuals may be seen as supporters of a healthy democracy; (4) changing and/or maintaining the social order in which education becomes a means for carrying out social transformation; and (5) education is intended to achieve organizational effectiveness where education is seen as an effort to develop the attitudes and skills needed to help organizations become more effective in achieving their goals.

Non-formal education develops various qualities of life-related attitudes and skills to be able to develop and build self-competence and social competence in community life. This is what then builds a much better standard of welfare and quality of life for the whole community. Indonesia, which has differences in terms of social life and various other contexts of life, needs to develop a pattern of social development that is much better and stronger in empowering the community.

Because in principle, the quality of people's lives, in general, can be seen from how the community can sustainably develop itself so that it can manage the potential of existing life much more perfectly. The role of out-of-school education in the community empowerment process cannot be underestimated. Because, awareness and formation of a human character who can manage their lives is not a simple process, but requires continuity and consistency in the process itself. This is the role of education outside of school in today's modern life, completely and truly.

**The Role of Educational Technology in Learning**

Learning is an activity or an activity that makes someone learn. This is by what was stated by Degeng that learning is an effort to teach students. That's why good learning, of course, must be based on various considerations so that later learning activities can run smoothly and optimally. Given the many learning problems, of course, it is necessary to find ways or solutions to overcome these learning problems, with the hope that the learning problems found can be overcome and a solution can be found.

So that learning will take place well and as expected. Among the many factors that can overcome these learning problems is educational technology. Educational technology will be able to assist in the resolution of learning issues. In this aspect, educational technology aids in the improvement of learning quality. Educational technology serves a variety of purposes in the classroom.

Yusufhadi Miarso has stated the following: (1) increasing educational productivity by: (a) speeding up the stages of learning, (b) assisting teachers in making better use of their time, and (c) reducing the burden on teachers in presenting information, allowing teachers to focus more on fostering and developing students' learning activities; (2) allowing for more individualized education: (a) reducing rigid and traditional teacher control, (b) providing opportunities for students to develop according to their individual abilities; (3) providing a more scientific basis for learning by: (a) planning learning programs in a systematic manner, (b) developing research-based teaching materials; (4) improve learning ability by expanding the range of presentation,
and except that the presentation of messages can be more concrete; (5) allows for more intimate learning, because it can: a) reduce the difference between lessons inside and outside school, (b) provide first-hand experience; and (6) enabling equal distribution of quality education, especially by: (a) being used together with personnel or rare events, (b) bringing education to those who need it.

Educational technology plays a role in improving the quality of learning. The five areas of educational technology put forward, it will be more clearly understood that educational technology starts to play a role from the beginning, namely when designing or designing learning. This can be explained that how a teacher before carrying out learning designs learning as well as possible, because a good design will, of course, affect the quality of learning later. In the design, it began to be studied how to design a learning system, design messages, learning strategies, and characteristics of students. If all this is understood by the teacher, it is hoped that the learning carried out will be of high quality.

**Community Education**

Community education has a function in school education activities, about the world of work and life. About school education, the function of community education is as a substitute, complement, and supplement. About the world of work, public education has a function as an activity that bridges a person into the world of work. Meanwhile, about life, community education serves as a vehicle for the survival and development of one's life.

The characteristics of community education are: (1) different forms of out-of-school education are characterized to achieve various goals; (2) limitation is a competition between several public educations which are seen as formal education from public education as a complement to other forms of formal education; (3) the responsibility for administering educational institutions outside of schools is divided by general/community supervision, personal supervision or a combination of both; (4) several out-of-school educational institutions are strictly disciplined with respect to teaching time, modern technology, equipment and reading books; (5) teaching methods also vary from face-to-face or teacher and study groups to the use of audio television, mobile practice units, demonstrations, correspondence courses, visual aids; (6) emphasis on the relative spread of theoretical and practical programs rather than public education; (7) unlike formal education, the level of the public education system is limited to which credentials are given; (8) teachers may be specially trained for certain tasks or have only professional qualifications which do not include the identity of the teacher; (9) recording of entry of students, teachers and leadership credentials, success of training, resulting in increased economic production, increased welfare and income of participants; (10) strengthening the form of public education has an impact on economic production and social change in a shorter time than in the case of formal school education; (11) most community education programs are implemented by youth and adults on a limited basis in life and work; (12) because it is used, public education makes national development complete. roles include knowledge, skills, and influence on program values; (13) held in a non-tiered, not sustainable, and implemented in a short time; and because of its nature so that the objectives, learning methods, and materials delivered are always different in each community education provider.

Public education is not a new thing in the repertoire of human culture and civilization. Community education has lived and been integrated into the life of every society long before the emergence and socialization of the school system. Public education has a different form and implementation from the existing system in school education. Community education arises from the concept of lifelong education where the need for education is not only in school education / formal education. implementation of community education is more emphasized on the provision of expertise and skills in a particular field.
The similarities between public education and school education can be seen from two points of view, namely the community's point of view and the individual's point of view. From the perspective of society, education means the inheritance or transfer of intellectual, artistic, political, economic, religious values, and so on; Meanwhile, from an individual point of view, education means the development of human potentials. Another similarity is that the function of education is to develop science, technology, and skills that prepare a generation to have and play a certain role in society. The educational process always involves the community and all cultural devices by the values and philosophies it adheres to.

Learning Innovation in Community Education

The demands of the competence of human resources in the 21st century. Non-formal education innovation is also driven by the development of opinions about the competence of 21st-century human resources in the last two decades which demands to be realized through various educational efforts, including non-formal education in the perspective of lifelong learning and sustainable development to produce a knowledge-based society.

In preparing oneself to have a competitive ability to enter the free market through lifelong learning strategies, formulate key competencies for human resources in terms of workforce demand which includes: literacy and numeracy skills, ability to master science, technology, and language, as well as skill competencies (new general skills in the form of abilities: problem-solving, communication, teamwork, creativity, learning to learn; and have new functional and occupational skills as required).

Astu [6] outlined the following 21st-century HR competencies: (1) the ability to think critically, laterally, and systematically, particularly in the context of problem-solving; (2) the ability to effectively communicate and collaborate with various parties; (3) the ability to develop their creativity to produce various innovative breakthroughs; (4) the ability to use ICT to improve performance and daily activities; (5) the ability to engage in contextual autonomous learning activities as part of personal development; (6) the ability to comprehend and use a variety of communication media to transmit varied ideas and engage in collaborative activities and interactions with a variety of people.

In addition, in the context of individual humans, they are expected to have 21st-century human character and behavior which include: (1) a responsible attitude toward all actions taken as an independent individual; (3) ethics, namely respecting and upholding the implementation of ethics in carrying out social life together; (4) human skills, namely having several basic skills needed to carry out functions as individuals and social beings; (6) have clear directions and principles in their efforts to achieve their individual goals; (7) a situation in which an individual has a clear reason and basis for every step and action taken; (8) has responsibility for the environment and the surrounding community; and (9) can improve humanity's quality of life through various activities and work carried out daily.

Individual abilities are also needed to deal with social problems faced in the twenty-first century, such as global awareness, namely the ability to see trends and signs of the times, particularly regarding globalization; financial, economic, business, and entrepreneurial literacy, namely expertise in managing various resources to increase business independence; citizenship literacy, namely the ability to carry out roles as citizens in vain; and financial, economic, business, and entrepreneurial literacy, namely expertise in managing various resources to increase business independence.

Learning Innovation

In implementing learning innovations, it presents its challenges for education actors, such as educators, students, institutions, and even provides challenges for the wider community such as parents. In practice, educators must find ways to continue to deliver learning material and be
easily accepted by students. Likewise, students are required to be able to adapt to situations and conditions like today, one of which is mental readiness.

Learning innovation cannot be divorced from the role of technology in its implementation. All learning demands can be met with the help of technology. This is consistent with Lestari's opinion [8], according to which digital technology in educational institutions is a way of assisting learning, both in terms of accessing the information on learning resources and in terms of supporting learning activities and connected to assignments. With the advancement of technology, several platforms, such as e-learning, Google Classroom, Edmodo, Moodle, Learning homes, and even video conferencing platforms, such as Google Meet, Zoom, and Visco Webex, are now available to assist in the application of online learning.

Previously, studies on the importance of educational technology such as this have been conducted, one of which was conducted by Haniffah Salsabila [9], who stated that technology has a critical role in increasing educational quality. Furthermore, technology can improve the efficacy and efficiency of the teaching and learning process, making it easier to meet educational objectives. Furthermore, the subjects that deal with this technology are diverse, thus there are new findings that validate past research.

2 Research Methods

This study uses descriptive qualitative research methods aimed at describing the role of educational technology in learning innovation in public education. Data collection in this study is using literature study techniques and previous research studies. This research employs a library method or strategy. The term “literature” or “literary study” refers to a set of tasks that include gathering library data, reading and taking notes, and analyzing research materials [10]. This research employs a literature review method. A literary study is a research project that uses library items such as documents, books, and magazines to gather information and data. Literature studies can also look at other reference books and similar earlier research findings to get a theoretical foundation for the subject at hand [11].

Books, journals, and websites about the chosen topic were employed as data sources for this study. In research, data is gathered by reading and/or exploring a variety of journals, books, and papers (both printed and electronic), as well as other data and information sources deemed relevant to the research or study. The content analysis method was employed to analyze the data in this study. This analysis is used to make reasonable inferences and can be re-examined in light of new information [12].

3 Results and Discussion

The importance of public education, which is the spearhead for the development of science and the formation of community culture, still has various problems in Indonesia. One of them is in public education which is one part of the world of education in Indonesia. Community education itself provides space for the community to learn outside of school time or the school environment. Usually, community education is provided in the form of extracurriculars, training institutions, or community learning activity centers. Public education has many important functions, in addition to being a supporter of formal education, public education also functions as a substitute program for school education. This program is usually given to people who do not have the opportunity to attend formal school education.

Through public education, its application in educational technology has two consequences that must be faced, namely: (1) personally must be able to adapt to these changes to exist and
make a positive contribution to various changes, especially in the field of educational technology and the educational needs of the community. (2) as professionals, they must continue to develop their professionalism to create various effective learning and learning innovations as solutions to learning problems that will be faced by students in community education with various programs and types of community education being developed. To face these challenges, several competencies must be continuously mastered and developed.

Educational Technology is the study and ethical practice of facilitating learning and improving performance through the creation, use, and management of technological processes and resources. This definition underwent renewal or consolidation in 2008. The following describes the concept of the terms used in the definition of AECT Educational Technology 2008 [13], namely:

Study.

As a collection of information and analysis through traditional conceptions of research.

a. The study is also interpreted as a theoretical understanding of the practice of educational technology needed for the development and improvement of science through research and reflection.

b. Ethical Practice. Refers to practical ethical standards that must be carried out by Education Technology practitioners. Practice ethics is something important to achieve success because without it success is impossible to achieve.

c. Facilitating. Designing learning environments, organizing learning resources, and providing media tools for learning. Learning activities can take place face to face or take place in a virtual environment or what is known as distance learning.

d. Learning. About memory, it is also concerned with understanding. Where the purpose of learning/education is understanding as knowledge retention.

e. Improving. Regarding product quality improvements that lead to more effective learning, changes in capabilities have an impact on real-world applications. Improving abilities requires meeting the demands of effectiveness such as product quality as a result of the learning process, effective learning products, and learner abilities that can be applied in the real world.

f. Performance. Regarding the ability of students to use and apply the newly acquired abilities, they can then organize and achieve learning objectives effectively.

g. Making, Using, and Managing In a variety of formal and informal settings, creating refers to research, theory, and practice in the creation of learning materials, learning environments, and learning systems. The term "using" refers to the philosophy and practice of connecting students to learning environments and resources. Individual management and information management, which refers to the problem of organizing people and planning, regulating, storing, and processing information, are both covered under managing.

h. Appropriate. Used to describe the word technology that is appropriate to the process and resources, which signifies the suitability and suitability of the educational goals to be achieved.

i. Technological. Contain the meaning of systematic application of organized knowledge or knowledge for practical tasks. The technology in question can be in the form of software or hardware needed in the learning process.

j. Processes. A series of activities directed at a specific outcome. Educational technology often identifies the process as the activity of designing, developing, and producing learning resources, which are classified as processes in the broad sense of educational technology.
Resources. Resources have been expanded with technological innovation and with the development of new understandings of how technological tools can help learners learn. Learning resources can be in the form of people, media/tools, technology, and materials designed to help students. (AECT, 2004).

Associated with various changes and developments in various disciplines of science and technology, Robert Reiser in Mursid [14] professor in the field of instructional systems and learning technologies, shows that 10 trends will affect the field of educational technology and at the same time become a challenge for educational technologists in their application to public education, namely:

a. Demands for continuous performance improvement in the world of work. One very reasonable thing, that every agency demands continuous performance improvement in its work environment. There are many ways to improve the competence of the workforce, including using non-instructional methods to complement the instructional method, namely by utilizing: motivational techniques, feedback systems, personal selection, workplace and job redesign, training and mentoring, performance support, knowledge management, and Informal learning.

b. The development of constructivist psychology in the world of education. Learning designers, namely how they can select effective learning strategies; have adequate prerequisite skills to be able to carry out the learning and learning process that will be implemented; provide adequate scaffolding to provide tutoring, and must also be able to consider the efficiency of learning.

c. The concept of knowledge management can be defined as the process of collecting, storing, and sharing valuable information, expertise, and insights, both within and across communities of people and organizations who share the same interests and needs. Rosenberg, in Reiser & Dempsey in Budiharto [15].

d. Developments in the ICT sector have also provided facilities and various conveniences for workers in accessing information. The development of a system that provides workers with various access to information and tools that support performance when needed. Nguyen, in Reiser & Dempsey, in Surani [16]. This condition also illustrates that they have broad learning opportunities to increase their capacity and capability in doing their jobs. This development is at the same time a challenge for educational technologists, how to take advantage of these various supporting facilities to be able to facilitate workers still being able to learn efficiently and effectively in public education.

e. Learning that utilizes the advantages of internet-based learning models, or better known as online learning. The development of internet-based learning models. ASTD State of the Industry [17]. Technology-Based, such as online, CBI, video, etc. The above conditions are certainly a challenge as well as a separate opportunity for educational technologists, because the more institutions that organize online learning, the more opportunities for learning designers to take part in the development and implementation of internet-based learning.

f. This informal learning process allows the learning process to be unlimited in time and place. The development of the concept of "informal learning". Challenges for learning designers, especially in: (1) Identifying the latest informal learning activities in the environment where they carry out their activities, (2) Identifying informal learning activities that are expected to exist in the environment (organization), (3) Arranging the
environmental conditions in which they work. Work that will maintain the expected informal learning activities.

g. The development of web-based tools is utilized to facilitate individuals in creating content, sharing knowledge, and collaborating with other parties through the web. The development of various types of social media. Social media that can be used to facilitate student learning include Wikis, Blogs, Podcasts, social networking sites (such as Facebook), and media sharing sites (such as YouTube). Among the challenges that must be answered by learning designers are: (1) How to choose effective social media tools to help facilitate the learning process from various types of learning tasks; (2) How to plan a structure/scaffold that is sufficient to support students in achieving learning objectives; and (3) How to identify suitable roles for instructors when social media is used, especially in: presenting content and providing feedback.

h. Development and utilization of various kinds of ICT-based games for learning innovation. Develop a variety of learning games. The development of variety and format of educational game software (Educational Games). The challenge that arises is how to develop learning games that can facilitate students' learning effectively. For this reason, Reiser, by adapting from Shute AERA's opinion), stated that a good game is designed to provide: (1) adaptive problem-solving challenges; (2) clear goals and roles; (3) High level of student control; (4) Motivating sensory stimulation; (5) Unreasonable feelings; (6) Providing continuous feedback; (7) Taking into account the criteria of a good game.

i. Design and implement effective science learning innovations. Learning science has become a trend that has received serious attention from various groups, including the field of learning technology, namely: (1) focusing on mastering in-depth understanding of concepts; (2) creating a student-centered learning environment; (3) using technology to create learning environments, provide students with new tools, and improve their understanding; (4) design for transfer of learning; (5) conduct study studies in real-world settings, not in the lab; (6) evaluate learning outcomes from various perspectives; and (7) research the design process.

j. Information and communication technology devices that are increasingly sophisticated, such as smartphones, tablet computers, iPods, etc., can now be used to support the learning process in community education which is carried out on a “moving” or mobile basis. The development of concepts and technology allows learning innovation to be carried out on a mobile basis. This learning model has been developed a lot. This is because this learning model has many advantages including relatively cheap technology costs, reducing the digital divide, easy use of physical classes, portable facilities "learning anywhere and anytime", the closeness between students and teachers.

4 Conclusion

In essence, although the school system is still considered important, the rationale for thinking has begun to be realistic, namely not solely relying on the school system to serve various educational needs that are increasingly booming and diverse. Guidance and development of community education are seen as relevant to be able to complement or support each other with the school system so that every human being can adjust his life by the times. Community education has a different form and implementation from the school education system. Community education arises from the concept of lifelong education where the need for
education is not only in school education / formal education. The implementation of community education is more emphasized on providing expertise and skills in a particular field. Guidance and development of community education are seen as relevant to be able to complement or support each other with the school system. So that every graduate can live with the times and is always needed by the community along with the development of increasingly advanced science and technology.

The rapid development of science and technology has had a major impact on human life. Life becomes easier and cheaper. However, the digitization of the program also has a negative impact. The role of humans is gradually being taken over by automatic machines. This of course will add to the burden of local and national problems. Challenges will inevitably be faced in every innovation and technology transition. We must be brave and ready otherwise we will be drowned by this era of disruption. The target of the greatest performance improvement in education is the teacher because students only follow the applied education system.

Educational Technology will continue to follow and adopt various changes and developments in science and technology, including the field of information and communication technology. This condition at the same time requires educational technologists to continue to study these changes and apply them to facilitate students in solving learning problems and improving their performance through learning innovations in community education, there are programs and types of services for lifelong learning.

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References


The Realization of Traditional Children's Game-Based Education in Facing Educational Challenges in Era 5.0

RR Siti Murtiningsih¹, Dela Khorul Ainia²
{stmurti@ugm.ac.id}
Faculty of Philosophy, Universitas Gadjah Mada²

Abstract. The development of technology and science has brought influences to various orders of life, giving rise to new values that can shift local values. One of them is through traditional games which teach various educational values. Currently, there are various modern games that have an influence on children's development. In line with this, the development of revolution 5.0 also affects the field of education, one of which is changing the way of thinking about education. This study aims to explain the role of traditional children's game-based education as an effort to deal with changes in the field of education in the 5.0 era. This research is a literature review with the object of books or scientific articles as well as journals and others. The analysis was carried out by interpretation, holistic coherence, description and synthesis analysis. The results of the study indicate that traditional children's game-based education plays a role in children's mindsets and perspectives on the phenomenon of technological and scientific development because they can be the basis for behavior.

Keywords: Traditional Games, Society 5.0 Era, Character education

1 Introduction

Introduction. Technological developments have brought about changes in various fields of life, giving rise to foreign cultures that influence local culture. One obvious example of the result of technological developments is the emergence of children's games such as game boy, playstation, mobile legend and the like. The presence of modern children's games has resulted in the shift of traditional children's games, so that traditional children's games are considered old-fashioned not in accordance with current conditions. Modern children's games not only have a positive impact, but also have a negative impact on children's growth and development, such as; children become addicted, aggressive and even become asocial. Traditional children's games are part of local culture which of course contains educational values that can be explored, so on the other hand as entertainment but can be used as guidance and teach noble values which are not found in modern games.

As a result of uncontrolled technological developments, it has also shifted the current traditional society, which can be found, for example, the narrowing of public spaces, playing rooms as media for the education of the nation's generation. Education is a human effort that consciously and continuously fosters his personality in accordance with the values prevailing in society and culture. Humans are creatures who face themselves in their world. He cultivates himself, elevates and lowers himself, unites and distances himself from himself. Humans are creatures who exist and face nature, so that humans are one with nature and at the same time
distant from nature. Humans always live and change themselves in concrete situations, but in that change humans are still themselves.

Education in Indonesia has now entered the 4.0 era, namely trends and teaching methods using online learning that uses the internet as a liaison between educators and students, but the presence of online learning developments has not been fully felt because not all school institutions have supporting facilities. The use of online learning methods is an innovation in the field of education. The most important thing in an effort to face the industrial revolution 4.0 is in the form of problem solving skills, creative, innovative, adaptive, critical thinking and able to negotiate with other people.

These abilities have relevance in an effort to face the era of society 5.0, the most important thing in dealing with the development of the era of society is to prepare human resources who are ready to be competitive and supported by good quality education. Thought and physical power are balanced, but this must also be balanced with emotional intelligence. Quality human resources are formed through processes, one of which is through education and training in preparing and developing quality human resources in accordance with social transformation. Education has now entered the era of society 5.0 where this era offers a society centered on balance. The existence of the internet is not only a medium of information but also to carry out life in an era where technology is part of human life itself and technological developments can minimize gaps in humans and economic problems in the future.

The emergence of society 5.0 is a society where various needs are differentiated and met by providing the necessary products and services in adequate quantities to the people who need them when they need them and where everyone can receive high quality services and live a comfortable and full of life with enthusiasm. [2]. The progress of education that is happening today, especially in the Indonesian nation, is a key in preparing for future competition. Education is an effort that aims to create innovation and creativity in equipping the skills needed in the future [3]. Through educative values teaching about noble character and maturity based on a noble culture as reflected through traditional children's games, presumably in the current era of globalization this is something that is rarely found.

The presence of the development of technology and information has shifted the relationship of traditional society, because some public spaces are currently limited. This is due to the presence of various modern children's games, so that children tend to play in front of the cellphone screen or in modern games. According to Dharmamulya [4], traditional games are games that are closely related to certain cultures, so that traditional games are assets that must be maintained in the midst of the current condition of society. Traditional children's games are also a tool to maintain relationships and social comfort in addition to entertaining themselves.

So traditional children's games are children's games that have existed for a long time that contain cultural values so that they can be used as a basis for strengthening character through local culture. The values contained in traditional children's games, for example in the engklek game, teach about sportsmanship, togetherness, hard work, and fun. The traditional congklak game can be used as a learning medium because there are nine character values in the congklak game, namely the value of honesty, hard work discipline, communicativeness, responsibility, curiosity, independence, creativity, and respect for achievement [5].

The games of sudamanda, bentengan, and gobag sodor contain values that reflect love for the homeland. So that traditional children's games have a role in instilling characters that reflect love for the homeland. Various kinds of traditional children's games in the past are actually loaded with pedagogical values. The educational values contained in traditional games now seem to be disappearing, traditional children's games which are part of local culture can be a medium for building personal character that is instilled from an early age and the most effective
media is through education. The educational values of traditional children's games teach about
noble character and maturity based on a noble culture as reflected in traditional children's games,
which nowadays in modern games rarely find noble character values. Various traditional
children's games can be a fun learning method, so traditional children's games need to be raised
for the education of the nation's next generation of children.

Children's character will be formed through three influences, namely the influence of family,
environment and school. So that collaboration and cooperation are needed between the three
environments to support the formation of characters that are in accordance with the teachings
of the noble values of the Indonesian nation. In line with this, it is necessary to conduct more
in-depth research regarding the character values contained in traditional children's games, as a
basis for addressing the challenges of education in the 5.0 era.

2 Research Method

This research uses sources from literature studies, so this research is a literature study. In
this study, the data used are divided into two types, namely primary data and secondary data.
Primary data is the main library source used in research, while secondary data is supporting
literature used to support research activities. Sources of data come from journals, research
reports, scientific magazines, relevant books, seminar results, scientific articles and so on. The
data analysis of this study used qualitative methods in the field of philosophy [6]. The data
obtained were then analyzed using the method of philosophical tools as follows:

a. Interpretation, the data obtained is understood and interpreted to reveal the meaning and
   concept in question, namely the pedagogical value in traditional children's games.

b. Induction and deduction, the theoretical data that has been collected is studied by analyzing
   all the main concepts one by one in relation (induction) in order to build a synthesis.

c. Heuristics, the data obtained is analyzed so as to get a new understanding.

d. Description, used to describe and explain systematically.

3 Result and Discussion

Educational Values in Traditional Children's Games

The development of technology and information has had a significant impact on today's life,
one of which has an influence on children's games. The existence of information technology is
slowly shifting traditional children's games which are full of educational value. Today's
children's games provide sophisticated and easy-to-play facilities, so children tend to interact
less with other people. The existence of advances in technology and information is currently
suspected to have a negative impact on the availability of information media that is difficult to
avoid, for example pornographic videos, violence, consumerism, bullying and others. The
Indonesian nation has a variety of cultural backgrounds, ethnicities, languages and different
social traditions [7] so that it can be a provision in exploring character values that come from
diversity.

One of them is that traditional children's games can be a learning method with a variety of
creativity because traditional games do not cost money. Traditional children's games tend to
take advantage of things that are in the environment and require several people to play them.
Traditional children's games can foster character values in children such as religious values,
nationalism, independence, mutual cooperation, integrity. On the other hand, traditional
children's games are part of the Indonesian culture which has been proven to have a positive impact on children's development [8].

One of the traditional children's games that have educational value is the congklak children's game. The game is a traditional children's game owned by various regions in Indonesia. The game is usually done using congklak seeds in the form of seeds obtained from the surrounding environment. Each region has its own mention of the game congklak. For example, in Sumatra, it is usually known as congkak, in contrast to the Javanese people who know it by playing dhakon, congklak, dhakonan. The congklak game is played by two people. It takes a board to complete the game, namely on the congklak board there are 16 holes consisting of 14 small holes facing each other and 2 large holes on both sides. Each player has 7 small holes and 1 large hole.

When playing the game of congklak, two players face each other, one of which starts can choose the hole to be taken and puts one hole to the right and so on. If the stuffed seeds run out in the small hole that contains them and other seeds then he can take those seeds and continue to fill them and if they run out in his big hole then he can continue by selecting the small hole on the side. But if the game stops in the empty holes on the opponent's side then he stops and gets nothing. The game of congklak can be said to be finished when there are no more seeds that can be taken.

Congklak game is one example of a variety of traditional children's games spread across Indonesia. These traditional games contain hidden educational values. If explored more deeply, traditional children's games have educational value a) train intelligence b) train social sensitivity and foster creativity c) train children's ability to recognize the value of honesty, sportsmanship and be able to judge good and bad things [9]. Traditional children's games have very important values so that they can support children's skills including 1) improving problem solving abilities in children 2) stimulating language development and verbal abilities in children 3) becoming a medium for developing social skills 4) being a medium for express emotions.

The importance of strengthening the value of education for the next generation of the nation which is extracted from traditional children's games can be an innovation in an effort to maintain the values derived from the local wisdom of the Indonesian nation. Character education explored through traditional children's games has the same essence and meaning as moral education and moral education. The purpose of character education is to form a good person. Through character values extracted from the local wisdom of the Indonesian nation, it can be supported by various strategies and innovations so that they are easily accepted and can adapt to the times.

Indonesian Education in Era 5.0

Education is a step in achieving a better life, through education is expected to have a positive impact on oneself or the surrounding environment. The presence of the development of technology and information provides various conveniences in supporting the needs of life. One of them is developments in the field of information technology. Education is currently trying to adapt to using internet media, so that the learning process can be carried out more easily without any limitations.

Currently, the presence of the internet has various impacts on sustainability in the field of education. The Indonesian nation has entered the era of the industrial revolution 4.0 which is information technology that develops rapidly and colors every human life. In the industrial revolution phase 4.0, there are fewer physically related activities, because they tend to carry out activities digitally [10]. However, technology and information continue to develop so as to encourage the creation of various innovations. One of them is era 5.0 or Society 5.0 which can be interpreted as a concept that was initiated by the Japanese government.
The presence of various innovations in the field of technology gave birth to various digital literacy movements, making searches in various areas of life easier and unlimited. In the era of society 5.0, people are faced with technology that makes it possible to access them in virtual space but feels like physical space. The presence of technology society based on big data and robots to do work that is usually done by humans. In the era of society 5.0, students in the learning process are directly faced with special roots that are prepared to replace educators or in this case the educator only acts as a facilitator. In order to support the preparation of skills in the future, skills such as leadership, digital literacy, communication, emotional intelligence, entrepreneurship, global citizenship, problem solving, teamwork [10]. This ability must be possessed by every individual so that they are ready to face future competition.

The presence of technological developments in the era of society 5.0 must be balanced with various supports, for example the readiness of human resources who have skills in the digital field and think, so that in this case educators are required to be more innovative, creative, and have the ability to adapt to the development of life. In addition, support in terms of infrastructure is also important, namely that not all educational institutions have supporting facilities in the form of adequate internet.

So it is necessary to evenly distribute the development of the internet network to all regions in Indonesia [11]. Internet-based education and learning does not have to be done in the classroom to be a possibility that will happen in the future. Students are not required to be physically present, but simply follow the online learning. It is necessary to be prepared to face technological developments while maintaining a balance between the values of local wisdom and the values of modernity, so that the noble values of the Indonesian nation cannot be replaced. The presence of the development of information technology can be an opportunity in creating innovations in various fields of life, especially in the field of education based on the values of the Indonesian nation.

**Educational Strategy Based on Traditional Children's Games in the face of 5.0 era education**

The Indonesian nation is currently faced with various problems so that a strategy is needed to unravel these problems. One of them is the formation of character attitudes, in this case parents have a role in educating children. The need to be equipped with values that are sourced from the local wisdom of the Indonesian people so that they are not influenced by values from other nations that are not in accordance with the order of the Indonesian nation's values [12]

Advances in technology and information are slowly having an influence on the lifestyle of the Indonesian people, one of which is changes in children's games. Nowadays children tend to choose modern games such as gameboy, mobile legend, other online games compared to traditional games such as gobak sodor, congklak, sudamanda and other traditional games. This happens due to various influencing factors.

For example, parents who are busy so they don't have time with their children, and provide gadgets as communication media that are equipped with various applications so that children don't go out to play. As a result, children become addicted and even difficult to get rid of, so that it affects the mindset and habits. If you don't pay attention, the child will slowly interfere with the child's activities and tend to be lazy to learn. Today's modern games have influenced children's mindsets, so children tend to be lazy to do activities even to socialize directly. In contrast to traditional children's games which are mostly done outside the home, besides that, they are also done together and tend to be done with motion.

Traditional children's games have various educational values, so that they will encourage children to have a sense of togetherness, mutual cooperation, creativity, innovation and agility. The presence of developments in technology and information is slowly shifting local values that
develop in people's lives. The use of increasingly sophisticated technology encourages someone to think critically and have creativity. The presence of the era of society 5.0 brings challenges in the world of education.

One of the important goals in national education is to form intelligent and characterful people. The next generation of the nation is not only theoretically intelligent but also has useful skills in people's social life. The era of society 5.0 is a development that does not come from the Indonesian nation, but needs to be addressed wisely, namely by continuing to implement the values of local wisdom originating from the cultural customs of the Indonesian nation.

The current actualization of traditional children's games is very much needed as an effort to balance the development of technology and information. Education in Indonesia is currently trying to apply the concept of education based on national character. The education is designed to shape aspects of culture, psychology, morals, taste and spiritual intelligence (Rizqy). The presence of the current development of information technology can be used as an opportunity in an effort to maintain the values derived from the culture of the Indonesian nation, one of which is through traditional games.

The era of society 5.0 is an opportunity that can help students and educators understand a theory that requires simulation according to actual conditions. Traditional children's games are full of educational values, one of which is the value of critical thinking, this is relevant to efforts to prepare education based on the era of society 5.0. Traditional children's games can be integrated in various technologies, so they cannot be separated from the substantial aspects. In addition, traditional children's games can also be integrated into educational curricula that are packaged more innovatively and creatively, so that they can be accepted by future generations.

In this case parents, teachers and the community have a role in character building in a person, so that parents, teachers and the community provide examples related to the implementation of character building. The example exemplified by parents and teachers is an important factor in the implementation of character education practices [13]. Traditional children's games are one of the strategies in transferring educational values which are carried out in a fun and full of educational values.

4 Conclusion

The phenomenon of increasingly rapid technological developments has brought various changes in the field of life. One of them is in the field of children's games, before the existence of modern children's games there were traditional children's games that were full of various educational values. This encourages children to think more critically, innovatively and have a sense of togetherness. In contrast to modern games which tend to have a negative impact on children, because children tend to be lazy to move and socialize, modern games are done online and without having to leave the house. So that children tend to be individualistic and lack social sensitivity.

The impact of technological developments, namely the presence of the era of society 5.0 provides opportunities for innovation in the field of information technology. So that if it is not understood and prepared in depth, it will have an impact on the gap in utilizing information technology. The presence of technology presents challenges in the field of education, because students and teachers must have skills in operating the internet. Through traditional children's games that are full of educational value, it can be packaged through innovation and creativity so that it is easily understood by future generations, traditional children's game-based education
can also be integrated into the learning curriculum, so that it becomes a foundation in an effort to maintain the existence of local values of the nation's culture.

References


The Effect of Emotion Regulation on Learning Saturation of Students in The Era of Covid 19

Miswanto¹, Nindya Ayu Pristanti², Nur’aini³
{miswanto@unimed.ac.id}
Universitas Negeri Medan¹²³

Abstract. This study aimed to investigated the effect of emotional regulation on learning saturation of students in the era of the covid 19 pandemic. This study was quantitative research. The population in this study were 608 students. The sample of this study were 241 students. The instrument given was an emotion regulation and a learning saturation questionnaire. The data were analyzed using a simple linear regression technique. The results showed that the significance value (0.00<0.05) and the tcount value is 4.261 > ttable 1.046, It could be concluded that there is an effect of Emotion Regulation on the Learning Saturation of students in the Guidance and Counseling Study Program, Faculty of Education, State University of Medan.

Keywords: Emotion Regulation, Learning Saturation, Covid 19

1 Introduction

Online learning during the COVID-19 pandemic has its own challenges, it requires the capacity to manage emotions so that learning becomes something fun and avoids boredom from spending more time studying at home. According to Cole [4] Emotion regulation puts emphasis on why and how emotions can regulate and facilitate psychological processes, namely focusing attention, problem solving, social support and why emotion regulation has a detrimental effect, such as disrupting the process of focusing attention, interfering with the problem solving process and disrupting social relations between individuals.

According to Gross [6] emotion regulation is an individual's way of influencing the emotions they have, when individuals can feel them and how individuals can experience or express these emotions. Gross [7] said that there are 2 strategies in emotion regulation, namely: (1) Cognitive Reappraisal, which is a form of cognitive change that involves a potential emotional core situation so that it can change the influence of the emotional. (2) Conscious Suppression of Expression of Emotions (Expressive Suppression) is a disclosure of responses that slow down behavior in expressing the emotions that are being experienced.

Strongman [15] argued that aspects of emotion regulation consist of changing situations, choosing situations, spreading attention, changing responses and changing cognitive. According to Goleman [9] emotion regulation is part of emotional intelligence. According to Balter [2] Emotion regulation is a form of effort in managing or regulating emotions and how individuals can experience and express emotions that can influence others to achieve a goal. Kring [10] said that Emotional regulation has a goal in minimizing negative consequences in a problem that is faced with how to evaluate and monitor one's emotional experience. Emotion regulation can help individuals to control themselves.
Then, when facing difficulties, they will not be influenced by negative emotions and are able to guide individual behavior in a positive direction. Faridh [5] argued that this allows individuals to minimize learning saturation. Learning saturation can be defined as a state of very low arousal according to Van Tilburg & Igou [20]. Boredom is conceptualized in an academic context, so it is referred to as academic boredom according to Pekrun [13]. An emotional state that can occur in all academic boredom such as when attending lectures or attending classes, while taking exams, and when preparing for homework.

From this perspective, learning saturation is seen as a form of emotion, Pekrun [13]. Then boredom is conceptualized in terms of factors that explain emotions in activities that are shaped by how the task is faced and felt. Previous studies have shown that academic boredom is associated with positive and negative levels of emotion, Goetz et al [8]. Learning saturation arises especially in situations where students experience low stimulation and lack of intrinsic motivation simultaneously.

In Pekrun (2011) Control Value Model, boredom results from activities that are less exciting and are considered low in personal value. Westgate and Wilson (2018) describe the Meaning Model and Attention Components, in which boredom occurs due to, (a) a mismatch between the cognitive and mental demands of available resources and (b) meaning or value related to the expected outcome. For some students, this aspect of schooling may be insufficiently stimulating and a lack of autonomy and undermining intrinsic motivation. Experiences of feeling trapped or constrained by unchanging school routines may reduce motivation and lead to poor outcomes (Goetz et al., 2014).

Learning saturation is an emotional situation that describes individuals experiencing mental or physical boredom as a result of the demands of work related to increased learning activities. According to Edi Sutarjo [16] based on the strength of the relationship with previous studies, it points to the fact that boredom does not overlap with other negative emotions nor does it represent only the absence of positive emotions. Suwarjo & Diana [17] said that learning saturation is defined as a condition of physical, mental and emotional exhaustion that has physical depletion characteristics, namely feelings of hopelessness and helplessness, feelings of emptiness, negative self-concept and negative attitudes accompanied by feelings of failure in achieving ideal self goals.

According to Edi Sutarjo, Dewi Arum WMP, Ni.Kt. Suarni [16] learning saturation, namely the existence of an emotional condition that occurs about someone who has experienced mental and physical saturation which becomes the demands of a job related to increased learning. Aspects of learning saturation according to Widari Ni et al [16] are firstly fatigue in the mind that comes from excessive tension, individuals with this symptom cannot concentrate, are not willing to do assignments, lose memory in a lesson. Second, emotional exhaustion where individuals feel they will feel excessively tired both physically and emotionally, individuals feel drained of energy and also feel empty and lose energy to face lessons and face other people. Third, it does not bring results, individuals cannot get maximum learning outcomes, learning outcomes do not get progress and even learning achievement will decrease.

Tam et al [18] provide evidence of this saturation dynamic. In their study, over two weeks, high school teachers self-reported their burnout. Students in each of their own classes reported their saturation at the end of the class session. Studies show that burnout is a commonly reported emotional state among high school students. The hypothesis in this study is that there is a positive relationship between emotional regulation and learning saturation in guidance and counseling students at the State University of Medan.
2 Methods

The research was conducted at the Guidance and Counseling Study Program, Faculty of Education, State University of Medan. This study uses a quantitative approach to survey methods that aim to test hypotheses. The data collection technique used an emotion regulation questionnaire and a learning saturation questionnaire. The population in this study were active students of the guidance and counseling study program for the 2021/2022 academic year with a total of 608 students. The sample was taken by calculating the slovin formula from the total number, namely 241 students. The data analysis technique used descriptive, regression and comparative statistics.

3 Result and Discussion

3.1 Result

Steps to identify students who experience emotional regulation, using the Mean and Standard Deviation. Based on the answers given by the respondents, the data can be distributed in several categories. Based on calculations using the formula of the Emotion Regulation variable, it is known:

\[
X_{min} = 43 \\
X_{max} = 75 \\
Range = X_{max} - X_{min} = 75 - 43 = 32 \\
Mean = (X_{max} + X_{min}) / 2 = (75 + 43) / 2 = 59 \\
SD = Range / 6 = 32/6 = 5.3
\]

Based on the above calculations, students who experience emotional regulation can be categorized in the form of table 1.

<table>
<thead>
<tr>
<th>Category</th>
<th>Range</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high</td>
<td>≥64</td>
<td>5</td>
<td>2.1%</td>
</tr>
<tr>
<td>High</td>
<td>52-63</td>
<td>122</td>
<td>50.6%</td>
</tr>
<tr>
<td>Medium</td>
<td>40-51</td>
<td>114</td>
<td>47.3%</td>
</tr>
<tr>
<td>Low</td>
<td>28-39</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Very low</td>
<td>≤27</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Based on the results of table 1, it can be seen that as many as 114 students (47.3%) were in the medium group, as many as 122 students (50.6%) were classified as high, 5 students (21.1%) were in the very high group. The histogram table below can clarify the level of emotion regulation.
In the emotion regulation variable, there are five indicators that can conclude that emotional regulation has an influence on student learning saturation during the covid 19 pandemic. The indicators in emotional regulation are: Situation Selection, Situation Change, Attention Dissemination, Cognitive Change, and Response Change.

**Table 2. Description of all Emotion Regulation Indicators**

<table>
<thead>
<tr>
<th>Category</th>
<th>Situation Selection (I)</th>
<th>Situation Change (II)</th>
<th>Attention Dissemination (III)</th>
<th>Cognitive Change (IV)</th>
<th>Response Change (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
<td>F</td>
</tr>
<tr>
<td>Very High</td>
<td>14</td>
<td>5.8</td>
<td>27</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>High</td>
<td>50</td>
<td>20.74</td>
<td>136</td>
<td>56.43</td>
<td>60</td>
</tr>
<tr>
<td>Medium</td>
<td>117</td>
<td>48.5</td>
<td>77</td>
<td>31.95</td>
<td>150</td>
</tr>
<tr>
<td>Low</td>
<td>59</td>
<td>24.48</td>
<td>1</td>
<td>0.41</td>
<td>26</td>
</tr>
<tr>
<td>Very Low</td>
<td>1</td>
<td>0.41</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Based on the results of the calculations in table 2, it can be seen that there is a Very Low category for one student in indicators (I) and (IV). In the low category, there are 59 students in the indicator (I), 1 student in the indicator (II), 26 students in the indicator (III), 11 students in the indicator (IV), and as many as 20 students in the indicator (V). The high score in table 2 is found in the situation change indicator (II) as many as 136 students (56.43%). This aims to show that most of the regulation of emotions occurs when situations change. For more details, see the histogram below.
Steps to identify the effect of emotion regulation on learning saturation, then use the Average and Standard Deviation. Based on the calculation, the data is distributed into several categories. Based on data from the learning saturation variable, it is known that the highest value \( X_{\text{max}} \) is known to be 63 while the minimum value \( X_{\text{min}} \) is 26. Then \( M \) and \( SD \) can be calculated as follows. Therefore, the level of student learning saturation can be categorized in table 3.

\[
X_{\text{min}} = 26 \\
X_{\text{max}} = 63 \\
\text{Range} = X_{\text{max}} - X_{\text{min}} = 63 - 26 = 37 \\
\text{Mean} = \frac{X_{\text{max}} + X_{\text{min}}}{2} = \frac{63+26}{2} = 44.5 \\
\text{SD} = \frac{\text{Range}}{6} = \frac{37}{6} = 6.1
\]

<table>
<thead>
<tr>
<th>Category</th>
<th>Range</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>≥64</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>High</td>
<td>52-63</td>
<td>39</td>
<td>16.2%</td>
</tr>
<tr>
<td>Medium</td>
<td>40-51</td>
<td>148</td>
<td>61.4%</td>
</tr>
<tr>
<td>Low</td>
<td>28-39</td>
<td>52</td>
<td>21.57%</td>
</tr>
<tr>
<td>Very Low</td>
<td>≤27</td>
<td>2</td>
<td>0.82%</td>
</tr>
</tbody>
</table>

From the table above, we can see that there were 2 students who belonged to the very low category (0.82%), 52 students were in the low category (21.57%). There are 148 students in the medium category (61.4%) and 39 students in the high category (16.2%). The histogram image below can clarify the data obtained.

![Fig.3. Frequency of Learning Saturation](image)

The learning saturation variable has three indicators of achievement, namely thinking fatigue there are 3 statements, emotional fatigue there are 9 statements and there are 3 statements that no produce results. The five categories are described in table 3. The following is a description of each indicator of learning saturation which can be seen in table 4.
Table 4. Description of all Learning Saturation Indicators

<table>
<thead>
<tr>
<th>Category</th>
<th>Thinking Fatigue (I)</th>
<th>Emotional Fatigue (II)</th>
<th>No produce result (III)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
</tr>
<tr>
<td>Very High</td>
<td>2</td>
<td>0.82</td>
<td>3</td>
</tr>
<tr>
<td>High</td>
<td>15</td>
<td>6.22</td>
<td>51</td>
</tr>
<tr>
<td>Medium</td>
<td>53</td>
<td>21.99</td>
<td>147</td>
</tr>
<tr>
<td>Low</td>
<td>87</td>
<td>36.09</td>
<td>40</td>
</tr>
<tr>
<td>Very Low</td>
<td>84</td>
<td>34.85</td>
<td>0</td>
</tr>
</tbody>
</table>

Based on the data in Table 4, it can be seen that there are students in the Very High category as many as 2 students in the indicator (II), 3 students in the indicator (II), and 1 person in the category not bringing results (III). Meanwhile, in the Medium category, there were 147 students in category (II), and from the indicator table, there were no results in category (III) seen as many as 108 students chose no produce results. Based on the data found, it can be seen in the histogram image below.

Fig. 4. Histogram of Learning Saturation Indicators

3.2 Discussion

The study was conducted to determine the extent of the influence of emotional regulation on student learning saturation at the State University of Medan. The data collection was carried out using a scale in the form of a google form which was distributed online. Data analysis was carried out by describing the results of each variable and each indicator. Through emotion regulation variables, it is known that as many as 122 (50.6%) students are in the high category level. The data above shows that students' assessment of their ability to manage emotions is in the high category.

Because the higher the category of emotional regulation that students have, the higher their ability to express their emotions. The above is supported by various research results which also say that emotion regulation develops throughout the human life span Cole [3] So, if you face a problem someone has assertiveness. Silaen [14] & Muna [12] argued in another study also shows that self-regulation training can reduce learning saturation.
Based on the results of data analysis per emotion regulation indicator, it can be seen that 136 students (50.6%) had the highest score obtained through the Situation Change indicator with a high category. Through the results of the analysis, it can be seen that students have high emotional regulation abilities, especially in changing situations. This is in line with research according to Ayuningtyas [1] which shows that emotion regulation in changing learning from face-to-face to online (online) is an important aspect that must be possessed by all students.

This was reinforced by a brief interview with a student of the Unimed Guidance and Counseling study program with the initials A, he felt the boredom of learning he felt due to his inability to manage emotions by changing the situation from face-to-face learning to online learning during this covid 19 pandemic. So, it cannot be ignored that emotion regulation has an important aspect in managing learning saturation.

In the analysis of the data variables shown in learning saturation, the highest score was 148 students in the medium category (61.4%) which means that student learning saturation is in the medium category. Through the results of data analysis per indicator of learning saturation, it can be seen that the highest score of 147 students (61%) was obtained on the indicator of emotional fatigue in the medium category.

Through the results of the data analysis, it can be seen that the emotional fatigue of students in learning saturation is in the moderate category. This is reinforced by interviews with student B who said that when studying online they experienced emotional exhaustion, so they often became angry and annoyed when the signal disappeared and there were too many lectures. Through the results of linear regression analysis with ANOVA, it can be seen that 18.1% of the learning saturation level is determined by emotional regulation factors.

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>938.097</td>
<td>1</td>
<td>938.097</td>
<td>18.160</td>
<td>.000</td>
</tr>
<tr>
<td>1 Residual</td>
<td>12346.152</td>
<td>239</td>
<td>51.658</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13284.249</td>
<td>240</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on the explanation above, it is known that there is an influence of emotional regulation on student learning saturation of the guidance and counseling study program, Faculty of Science, State University of Medan. The validity of the regression equation in the data above can be found through the t-test. With the test rule that if tcount > ttable then the hypothesis can be accepted.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>23.801</td>
<td>4.879</td>
<td>4.878</td>
<td>.000</td>
</tr>
<tr>
<td>1</td>
<td>Emotion Regulation</td>
<td>.396</td>
<td>.093</td>
<td>.266</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.261</td>
<td>.000</td>
</tr>
</tbody>
</table>

Through the results of the significance value of the coefficients table, a significance value of 0.00 < 0.05 can be obtained, so it can be concluded that there is an influence between the Emotional Regulation variable (x) on the learning saturation variable (y). Then, after looking for ttable at a significant level of 0.05 with n-2 = 239, a value of 1.046 was obtained. It turns out that tcount > ttable or 4.261 > 1.046, therefore the hypothesis is accepted. Then it can be
proven that the equation in the regression is valid or if in a simple way it can be proven that emotional regulation significantly affects the learning saturation of students in the guidance and counseling study program, Faculty of Education, State University of Medan.

In this study, it can be found that emotional regulation has a contribution of 18.1% in reducing the level of student learning saturation, of that amount, there are still 81.9% which is another determining factor that can affect student learning saturation and is not discussed in the study. Through the studies conducted, it is proven that emotional regulation is not too much or can be said to be only a little in influencing the decrease in the level of student saturation.

However, emotional regulation takes part in reducing student learning saturation levels and therefore cannot be ignored. If students are able to regulate emotions appropriately, then student skills in learning will increase so that in this era of the covid 19 pandemic, where learning is carried out online (on a network), students are able to manage learning saturation and students can be independent in learning.

4 Conclusion

The emotional regulation of students in the guidance and counseling study program is in the high category, as many as 122 (50.6%) which means that students' assessment of their ability to manage emotions is high because the higher the category level of emotion regulation that students have, the higher their abilities in expressing their emotions. The indicator on the emotion regulation variable that gets the highest value is found in the situation change indicator. The level of learning saturation of the UNIMED guidance and counseling study program students is in the moderate category (61.4%), the indicator on the learning saturation variable that has the highest score is emotional fatigue.

The results of the linear regression analysis with ANOVA showed that 18.1% of the learning saturation level was determined by emotion regulation factors. Judging from the significance value of the coefficients table, a significance value of 0.00 <0.05 is obtained, therefore, it can be concluded that there is an influence between the emotional regulation variable (x) on the learning saturation variable (y).

Then, after looking for ttable at a significant level of 0.05 with n-2 = 239, a value of 1.046 was obtained. It turns out that tcount > ttable or 4.261 > 1.046, therefore the hypothesis is accepted. Based on this, it is simply proven that emotional regulation has a significant effect or it is proven that the regression equation above is already valid on the learning saturation of students in the guidance and counseling study program, Faculty of Education, State University of Medan, for the 2021/2022 academic year.

References


An Analysis of The Application of Responsive Relationship Approaches in The Assistance of Children learning at Home during the Covid 19 Pandemic

Aman Simaremare¹, Yasaratodo Wau², Trisnawati Hutagalung³, Husna Parluhutan⁴, Sri Ngayomi Yudha Astuti⁵
{tuansimare@unimed.ac.id¹}

Faculty of Education, Universitas Negeri Medan-Indonesia¹, Faculty of Language Arts⁴, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Muhamadiyah Sumatera Utara⁵

Abstract. This study aims to find out the application of responsive relationship approaches carried out by parents in mentoring children learning from home during the covid-19 pandemic. This study was conducted at the Salsa School of Percut Sei Tuan District of Deliserdang Regency with research subjects as many as 30 parent-children who are members of the Salsa School Committee. The object of this study was a responsive relationship approach applied by parents in accompanying children to learn from home during the covid-19 pandemic. Techniques and instruments of research data collection were carried out through questionnaires, then research data is analyzed using descriptive statistics. The results showed that the average score in parental care applied a responsive relationship approach in mentoring early childhood from home 2.55 included the rare category. Meaning that the responsive relationship approach has not been done by parents with.

Keywords: Responsive relationships, child assistance, home study, covid 19

1 Introduction

The emergence of coronavirus disease (Covid-19) which first occurred in Wuhan China with its rapid spread to various countries in the world, resulting in many positively confirmed cases of covid-19 and increasing cases of death made WHO on March 12, 2020 issued an announcement that covid-19 as a pandemic. On April 13, 2020 the President of the Republic of Indonesia determined that Covid-19 as a national disaster due to the high number of confirmed cases of Covid-19 in Indonesia, namely as many as 8,607 people, 720 deaths and 1,042 people recovered. [1].

The increase in the number of confirmed cases of Covid-19 in Indonesia led the government of the Republic of Indonesia to issue a policy to always maintain personal hygiene, social distancing, physical distancing, quarantine of the region, work at home for employees, to restrictions on human mobility from region to region. [2]. Furthermore, the Minister of Education and Culture of the Republic of Indonesia. Issuing circular No. 4 of 2020 concerning 'Implementation of Education Policy in Emergency Period of Corona Virus Disease (Covid 19) one of which is the implementation of the learning process for learners from kindergarten to college takes place from home.
The policy of learning from home forces parents to carry out their main functions and roles to return to be educators and teachers for children at home, especially for early childhood who have not been able to learn independently but need parental assistance. Slameto[3] states that the family as the first and foremost educational institution for children plays an important role in the achievement of children's academic success. Fostering a spirit of learning for children to learn from home during covid-19, especially for early childhood and elementary school children in low grade is not easy. There are several factors outside of children that can support children learning from home, including available learning facilities, internet connection, and parental attitudes while accompanying children at home.

During the pandemic, children have to study at home. The role of parents while accompanying children to learn at home becomes very important to foster the spirit of learning children from home. But the results of research conducted on kindergarten children in Ngawi Regency showed that in general, children's emotional social behavior during online learning was less cooperative, less tolerance, less socializing with friends, children's emotions that sometimes felt bored and sad, children felt longing for friends and teachers and children were also recorded experiencing verbal violence. [4].

Based on the results of the study, parents are required to be able to create a comfortable atmosphere and learning conditions at home so that children can follow the learning process at home well and can meet the child's psychosocial needs. When analyzed why the condition can occur, allegedly one of the causes is related to the approach taken by parents less apply responsive relationship approach during child learning at home. Because if parents apply a responsive relationship approach in the family, it will develop trust in their parents and can also bring a feeling of security in the child can even foster high motivation for children to learn from home.

In connection with these issues, want to know how parents in applying a responsive relationship approach while accompanying children to learn from home in early childhood who are members of the Salsa Percit school committee.

The Concept of Parental Assistance – Children in the Family

Parental assistance to children can be interpreted as parental guidance and parenting activities to children in all activities of children's lives at home including children's learning activities at home. Various patterns of parental assistance that can be done to children in home learning activities, among others: providing learning facilities, supervising children's learning activities at home, supervising the use of children's learning time at home, supervising the difficulties faced by children in learning, and helping children in overcoming learning difficulties at home. The success of child assistance depends on parenting patterns applied by parents in the family or at home. The parenting that is expected to occur in the family is a warm and responsive parenting.

According to Barber [5] Parents who tend to apply responsive parenting will try to provide warmth and emotional support to the child. Then Baumrind [6] responsive parenting is characterized by affection, engagement, and support that parent give to children. Furthermore Filus et al. [7] also stated that in responsive parenting children feel comfortable interacting with parents. Likewise, Bogenschneider[8] states that in responsive relationships there is a good emotional connection between parent-children.
To realize this success, as long as parents do mentor done by parents must be based on a
reflexional and responsive relationship to the child. Respectful relationships are indicated by
respectful, polite and caring relationships, while responsive relationships show quick and
positive reactions to a child's needs. According to Lally & Mangione[9] responsive involvement
in a family built on a platform of mutual respect and trust between parent and child can build
confidence in the child. In addition, parents are sensitive to the uniqueness of children, support
social emotional and cognitive development and support the child's desire to learn.

Based on the above description, it can be tested that assistance with a responsive
relationship approach indicates the responsiveness of caregivers, parents or adults in
understanding, responding, and providing quick, positive and appropriate action to cue the
child's needs in a warm and loving way. What mentoring patterns that show responsive
relationships in parenting practices can be seen by comparing parenting patterns that are
common to parents to children.

Theoretically there are various patterns of parenting, one of which is the parenting pattern
proposed by Baumrind which is known as the classic parenting pattern. This parenting pattern
consists of authoritarian, authoritative, permissive, and neglectful styles. The four parenting
styles are grouped into two orthogonal dimensions: responsiveness dimensions and
demandingness dimensions[10], as presented in Figure 01 below.

These four parenting styles show a combination of acceptance and responsiveness on the
one hand and demands and control on the other [10]; [11]; [12]. The following will explain these
parenting styles one by one, among others:

a. Authoritative parents

This style shows that parents have a high responsive attitude, encourage children to be
independent, be warm and compassionate towards children, show friendly relationships, show
happy and supportive attitudes towards the child's constructive behavior, expect adult and
independent child behavior according to their age, but parents apply limits to their actions
clearly, firmly and sensibly according to the child's abilities. Willing to discuss the expectations
of old and children full of warmth and affection, responsive to the needs of children, embrace
children with friendly, oriented to children's achievements and still control the child's behavior.

The impact of applying this authoritative style makes children cheerful, self-controlled and
independent, and achievement-oriented. They tend to maintain friendly relationships with peers,
cope well with stress, take an interest in new things, and be cooperative with others.
b. Authoritarian parents.

This style shows that parents demand compliance from children with high standards and strict rules without regard to the child's needs, inflexible, likes to suppress or discourage the child, is not responsive when interacting, a somewhat distant and cold relationship with the child. Parents with this style of breastfeeding force the child to follow the rules that have been set, punish if the child violates, apply boundaries and controls strictly and rigidly to the child, avoid verbal arguments with the child.

The impact of this parenting style makes the child often unhappy, not confident to try something new, withdrawn, there is no initiative to start the activity, communication skills are weak, even the child is likely to be shy and behave aggressively.

c. Permissive parents

This parenting style is often called a style that follows a child's will or desire. Parents show high responsiveness, warm relationships, always receive children's encouragement and adjust to children's needs, but very little or almost no direction and guidance is given to the child, often not even expecting compliance with the rules or standards that the child must believe. Parents who run this style are very involved with the child even though they do not supervise them too much but let the child do what he wants. The impact of this parenting style makes it difficult for children to learn to control their own behavior, always hoping to get their wishes, children rarely learn to respect and respect others, may dominate, egocentric, disobey rules, difficulties in social relationships with peers, children are impulsive, aggressive, obedient, spoiled, less independent, and less socially mature.

d. Neglectful parents

This parenting style is to ignore or let the child act as he pleases. Parents with this style are sometimes referred to as neglectful parents, very rarely involved in the child's life, no guidance from parents for expected behavior, little communication, no concern for the needs of children, often hands off from their children's lives, no supervision of the child's behavior, affection and support for the child is sorely lacking. The impact of this parenting style makes children feel that other aspects of a parent's life are more important than themselves, children are less likely to have social abilities, poor self-control, are independent, often have low self-esteem, are immature, and may feel alienated from family, and insecure.

Based on an analysis of the four parenting styles or patterns above experts draw the conclusion that an effective parenting style to show and build responsive relationships when parents accompany children in the family is authoritative parenting on the grounds, there is a balance between parental control and child autonomy so that independence in the child is formed, tends to include children in activities of various activities, giving children the opportunity to express opinions or views when there is discussion in the family so as to help children understand social relationships and build good social competence, and the warmth and involvement provided by parents makes children more able to accept the influence of parents.

Application of Responsive Relationships in the Child Assistance Process

As explained above, warm parenting from parents can be realized through responsive parenting characterized by the affection, involvement, and support that parent provide to children. Related to that, Pettersen and Wittmer [14] stated that responsive parenting is characterized by a quick and appropriate response given by parents to the needs of the child so that it will develop trust in their parents and can also bring a feeling of security in the child. Wittmer &Petersen further states that responsive parenting is a responsive attitude that refers to how sensitive and accurate an adult is in understanding and responding to cues displayed by an infant or child.
A responsive adult is a person who is sensitive and attentive in responding to the child. Safe relationships in parental assistance to children are needed by children in learning from home. The role of parents in a child's learning provides the emotional load and security that the child needs and is also sensitive to providing an engaging and responsive environment without being too stimulating. Parents support learning by making good decisions when considering what to do and how the child is doing his or her job. Adults should be able to see and appreciate the strategies used in home learning.

Children in home learning need a continuous, responsive, secure and warm relationship, so that the relationship becomes meaningful. Every child will feel safe and focused in learning, if the child experiences affection from parents such as hugging the child, inviting the child in conversation, interactive play with children, a child will feel safe when their caregiver is sensitive (warm and caring), and conversely the child will feel unsafe if the caregiver is rude (nagging, threatening children, and punishing), and busy alone (Howes & Hamilton [16].

Furthermore, Hinde defines responsive relationships based on dimensions: interaction content, diversity of interaction, interaction quality, interaction meanings, interaction expediency, intimacy, interpersonal perception, and commitment [17].

a. Interaction content

Interaction content describes the content of what is done in the process of interaction between parents and children in the family, such as determining routine activities for children, showing affection, sharing experiences and interests for children, and showing a pleasant emotional content to the child.

b. Diversity of interactions

The diversity of interaction that occurs in the relationship of parents and children promotes a variety of interactions between parents and children in the family, such as inviting children to have conversations, taking children for a walk, singing with children's songs, telling stories and other routine activities with the intention of achieving moments of closeness of parents.

c. Quality of interaction

The quality of these interactions indicates a parent's sensitivity to the child's behavior, can interpret exactly what the child needs without having to express it verbally, and can respond quickly and positively to the child's wishes. The quality of parental-child interaction is characterized by warmth, security, trust, positive affection, and a parent's responsiveness to the child's needs.

d. Meanings of interaction

The meaning of interaction in responsive relationships is characterized by parents who can understand the child's desire of the behavior he displays even though it is not expressed through words but rather from the movements of his body.

e. The usefulness of interaction

The usefulness of interaction is the impact felt by parents and children in the interaction process. The pattern of interaction that is well established in the family will create a beautiful atmosphere and have a positive impact both on parents and on children, such as only motivation and enthusiasm in doing their activities, not easy to complain if facing difficulties, and can coordinate with children to achieve common goals, for example when feeding children, when children learn, And so on.

f. Intimacy of interaction

Intimacy interaction is the result of openness, trust in one another, and a shared commitment to maintaining close relationships. Intimacy of interaction between parent and child can be realized by maintaining and maintaining a warm emotional charge, desire for closeness, feelings of security in the child, and the willingness of parents to support the child's well-being.
g. Interpersonal perception
   Interpersonal perception can be realized by the way parents are willing to listen actively
   and well to each child's speech, understand, respond, and ask about the child's feelings well and
   appropriately.

h. Commitment to interaction
   The commitment of interaction is expressed in a decision to give birth to the loyalty and
   responsibility

2 Research Methods

This research was conducted at the Salsa School, Percut Sei Tuan District, Deli Serdang
Regency in July - September 2021. The subjects of this study were parents of early childhood
children as many as 30 parents in pairs with children who were members of the Salsa school
committee. The object of this research relates to the responsive relationship approach in
assisting children while accompanying children to learn from home during the pandemic.
Instruments and data collection techniques were carried out using a questionnaire, then the
research data were analyzed descriptively by statistical means.

3 Result and Discussion

The application of a responsive relationship approach in assisting children to study at
home

Research data on the application of a responsive relationship approach in assisting children
studying at home during the COVID-19 pandemic consists of eight indicators which include 1)
interaction content, 2) interaction diversity, 3) interaction quality, 4) interaction meanings, 5)
benefits, interaction, 6) intimacy of interaction, 7) interpersonal perception, and 8) commitment.
Based on research data, it is known that the lowest score is 52, the highest score is 81, the
average score is 63.73, the range of scores is 29, the standard deviation is 5.24. Based on these
data, the distribution of this variable data score is presented using the Sturgess rule in the form
of a group distribution table consisting of 6 class intervals with an interval length of 5, as the
data in Table 01 below:

<table>
<thead>
<tr>
<th>Class Interval</th>
<th>F.Absolute</th>
<th>F.Relative (%)</th>
<th>F.Cumulative</th>
<th>F.Relative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>52 – 56</td>
<td>2</td>
<td>6,67</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>57 – 61</td>
<td>7</td>
<td>23,33</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>62 – 66</td>
<td>14</td>
<td>46,67</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>67 – 71</td>
<td>5</td>
<td>16,67</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>72 – 76</td>
<td>1</td>
<td>3,33</td>
<td>29</td>
</tr>
<tr>
<td>6</td>
<td>77 – 81</td>
<td>1</td>
<td>3,33</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 1. Distribution of the frequency of applying the responsive relationship approach in
assisting children studying at home during the COVID-19 pandemic.
Based on Table 0.1. above, it is known that the average parent applying a responsive relationship approach to assisting children learning from home (63.73) is in the third interval class (62 - 66), meaning that there are 14 people (46.67%) respondents are in the average class average, 9 people (30%) of respondents were below the class average, and 7 people (23.33%) were above the class average. Furthermore, based on the frequency distribution of the scores above, it can be seen in Figure 0.1. following.

![Fig.2. Data diagram of the responsive relationship approach](image)

Furthermore, to identify the level of tendency of parents to apply a responsive relationship approach in assisting children to study at home during the COVID-19 pandemic, it was carried out by comparing the mean and standard deviation of empirical data with the mean and ideal standard deviation of the research score. The ideal mean of research scores on this variable is calculated through calculations based on the normal curve as follows: the minimum score for theoretical data is 25 and the maximum score is 100. So the ideal mean value = 62.5 and the ideal standard deviation (SDi) = 12.5.

Then categorization of levels (ordinal) is carried out to place individuals in groups whose positions are tiered according to a continuum based on the measured attributes. By referring to the prices above, it can be identified the level of tendency for parents to apply a responsive relationship approach in assisting children to study at home during the COVID-19 pandemic as shown in Table 0.2. following:

<table>
<thead>
<tr>
<th>Score interval</th>
<th>F</th>
<th>%</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 44</td>
<td>0</td>
<td>00,00</td>
<td>Low</td>
</tr>
<tr>
<td>45 - 63</td>
<td>17</td>
<td>56,67</td>
<td>Less</td>
</tr>
<tr>
<td>64 - 81</td>
<td>13</td>
<td>43,33</td>
<td>Enough</td>
</tr>
<tr>
<td>&gt; 81</td>
<td>0</td>
<td>00,00</td>
<td>High</td>
</tr>
</tbody>
</table>

N = 30

Based on Table 0.2. above, it is known that the level of tendency for parents to apply a responsive relationship approach in assisting children studying at home during the COVID-19 pandemic tends to be less. In more detail, it was stated that the poor category reached 17 people (56.67%), followed by the sufficient category as many as 13 people (43.33%), while the high
and low categories respectively (0.00%). The data in table 02 above can be presented in the statistical diagram in the following figure 02.

![Diagram of the tendency of parents to adopt a responsive relationship approach](image)

**Fig.3.** Diagram of the tendency of parents to adopt a responsive relationship approach

Thus, it can be stated that parents who apply a responsive relationship approach in assisting children to study at home during the COVID-19 pandemic tend to be less. Furthermore, to find out in more detail the application of dimensions and indicators of responsive relationships by parents in assisting children during learning from home can be explained based on the following dimensions.

a. **Interaction content.**

In this dimension, it can be seen that parents rarely set routine activities for children to study at home (an average of 1.8) and provide guidance for children to carry out learning activities at home (an average of 2.3). What people have often done is to help children learn to do assignments given by the teacher at home (an average of 2.7), and to try to grow children's interest in learning at home (an average of 2.63).

b. **Diversity of interactions**

In this dimension, indicators that are rarely used by parents in responsive relationships, such as: taking children for a walk when the child feels bored (average 2.37), but what parents often do is invite their child to have a conversation while studying at the school. home (average 2.6) and invites children to sing when children show less enthusiasm for learning (average 2.57).

c. **Quality of interaction**

In this dimension, it can be seen that parents often show a responsive attitude to every behavior displayed by their children while studying (an average of 2.77) and respond quickly to children's conversations (an average of 2.63), but parents rarely joke with their children. when studying at home (average 2.47) and showing appropriate responses to children when interacting (mean 2.5).

d. **Interaction meanings**

In this dimension, it can be explained that parents often understand the child's wishes when interacting at home (an average of 2.77) and are often able to understand the child's circumstances and feelings when interacting at home (an average of 2.63).

e. **Interaction benefits**

In this dimension, it can be seen that parents often entertain children who have learning difficulties at home (an average of 2.6), but they rarely work together with children to achieve common goals (an average of 2.5).
f. Intimacy
   In this dimension, it is known that parents rarely act in support of the child's well-being (mean 2.53) but often maintain a warm emotional charge with the child (mean 2.63) and listen attentively to the child's conversation when he or she reveals something (an average of 2.67).

g. Interpersonal perception
   In this dimension, it can be seen that parents rarely create feelings of security in their children when interacting at home (average 2.5), rarely understand the needs of children at home (average 2.43), but parents often support every behavior children who are fun (mean 2.6) and also often open to hear and accept the opinions of children at home (mean 2.57).

h. Commitment
   This dimension shows that parents often act supportively and try to maintain children's welfare (average 2.7), often reprimand children when they make a mistake (average 2.67) and also often praise children when showing bad behavior. well at home (mean 2.6).

Taking into account the results of the data analysis above, it can be concluded that the application of the responsive relationship approach by parents in assisting children while studying from home during the COVID-19 pandemic has not been carried out properly. Ideally, so that children can carry out their learning activities happily, comfortably, and enthusiastically, parents need to apply a responsive relationship approach properly, this is in line with the statement of Pettersen and Wittmer [15] if responsive parenting is carried out properly it will be able to create feelings of security in the child.

Furthermore, Baumrid [16] also stated that parents who have a high responsive attitude will encourage children to be independent, warm, make children cheerful, able to cope with stress and achievement oriented.

4 Conclusion

   Based on the results of the research and discussion above, it can be concluded that the responsive relationship approach in assisting children during learning from home has not been fully implemented properly, especially in the dimensions of interaction content, diversity of interactions, quality of interactions, usefulness of interactions, and interpersonal perceptions. Meanwhile, the dimensions that have been implemented well by parents while accompanying children to learn from home are only those related to the meaning of interaction, interaction intimacy, and commitment. In order for this responsive relationship approach to be better implemented by parents in child assistance, parents' insight into the responsive relationship approach needs to be improved through parent-child mentoring programs.

Acknowledgement

   On this occasion, thanks were conveyed to the Rector of Medan State University who provided financial support for the implementation of this research. Thanks were also conveyed to the dean of the Faculty of Education, Universitas Negeri Medan for his support for the implementation of this research. Researchers also dreamed of thanking the mother of the manager of the Salsa School along with parents who are members of the committee of the Sei Tuan Tuan Salsa School of Deliserdang Regency for their support for the implementation of this study.
References


Development of Teaching Materials for Practicum Accounting for Service Companies Based on Lectora Inspire to Improve Student Learning Outcomes

Dwi Rayana Siregar¹, Thamrin², Eko Wahyu Nugrahadi³
{dwirayanasiregar@gmail.com}
Postgraduate, Economics Education Universitas Negeri Medan¹²³

Abstract. The purpose of this study was to produce appropriate and effective service company accounting practicum teaching materials to improve student learning outcomes. This study is a developmental study using an ADDIE model adapted to research needs. The results show that the results verified by material experts are 88.25% of the very effective categories, the results verified by media experts are 83.25% of the very effective categories, and the results of textbook design verification are 93% of the effective categories are very effective categories. On the other hand, the teacher's response to the teaching material was 94% in the very good category, the individual experiment was 91.75% in the very good category, the group experiment was 91.29% in the very good category and the large group experiment was 91.05% Very nice category. Lectora Inspire based accounting practicum teaching material is used 'effectively' in accounting learning to improve student learning outcomes in accounting practicum subject at SMK S Al Ikhlas Pangkalan Susu XI AKL Services Company.

Keywords: Development of Teaching Materials, Service Company Accounting Practicum, Lectora Inspire

1 Introduction

The development of quality human resources is a central point in the world of education to prepare for the challenges of the development of information technology. To face these challenges, every teacher should choose the right learning strategy by using learning resources that make it easier for students to learn. Learning is directed at empowering students to meet increasingly complex demands. Learning is a process that requires interaction between educators and students in an educational interaction. According to Faturrohman (2017: 42) learning is a conscious effort from educators to make students learn, namely the occurrence of changes in behavior in students who are learning, where the change is with the acquisition of new abilities that apply in a relatively long time and because there is effort. As educators, we must have good learning qualities in order to become professionals. Teaching materials are one of the important tools during the learning process because teaching materials can stimulate the thoughts, feelings, interests and attention of students which can be used to get interaction between teachers and students. According to Kirana (2020:82) teaching materials are learning resources that are needed by students and teachers as learning tools. Munawar (2020:311) states “The use of teaching materials serves to assist educators in carrying out the learning process in the classroom.”

Teaching materials play a very important role in helping students understand the concepts and learning materials that are delivered optimally. Because the role of these teaching materials is very large, it is necessary to innovate the teaching materials used so that the teaching materials become more interesting for students to use. According to Rahmatun (2021:40) in the current era of education, most of them still use printed teaching materials, such as textbooks which at times cannot be used by students or can be said to be less practical, so in this case the use of technology in learning is still very important. not enough. Technology-based teaching materials are now quite diverse by bringing up visuals, images and animations that are intended to convey learning messages to students. In this case, interactive digital teaching materials will be packaged with the help of the program Lectora Inspire-based. Lectora Inspire is a program open platform which
means it can be used on any computer device. Teaching materials with the program Lectora Inspire can be an alternative in delivering learning.

Based on the results of interviews with the service company Accounting Practicum subject and class XI AKL students at SMK S Al Ikhlas Pangkalan Susu, the teacher revealed that the teaching materials used were still in printed form, namely textbooks, which were very limited in number. Package books are only given when the hours of the lessons take place that students cannot take home. This causes students to have difficulty studying at home which causes low learning outcomes. In addition, the teacher stated that in delivering the material had not been supported by interactive teaching materials so that it had an impact on the lack of understanding in students. Furthermore, students stated that the teaching materials used tended to make students feel bored so that there was no desire for students to learn which resulted in low learning outcomes. According to Rahmawati (2020:108) one of the teaching materials that can arouse the desires of students in the current technological era is interactive teaching materials. Therefore, researchers are interested in developing-based teaching materials Lectora Inspire to support service company accounting practicum learning activities that are more effective and efficient in improving student learning outcomes. Lectora inspire-based teaching materials that are developed will use visuals, images and animations that aim to convey learning messages to students.

Teaching Materials with Lectora Inspire

Utilization of information technology in the manufacture of teaching materials is needed. Learning with information technology is made so that students can learn according to their abilities. Lectora Inspire is an application program that can be used to create presentations and learning media. According to Mas'ud (2014:1) Lectora Inspire is software that can be used to combine flash, record video, combine images, and capture screens. The most important reason for choosing-based teaching materials Lectora Inspire is the influence of advances in technology and information in the realm of education. Students are encouraged to have an open mind so as not to be left behind by the times (Rahmawati, 2020: 109). Teaching materials Lectora Inspire are equipped with various interactive features, observation videos, materials, and practice questions. This teaching material has been adapted to the basic competencies that have been determined.

Practicum of Accounting for Service Companies.

Practicum of Accounting for Service Companies is one of the productive subjects for Accounting and Institutional Finance programs in Vocational High Schools. This subject is related to the accounting cycle in service companies. A service company is a company that is engaged in providing services that provide convenience, comfort, or enjoyment to people who need it. Although in providing services, physical tangible goods or physical facilities are needed, facility users do not pay for these physical goods but for services that accompany these physical goods (Suwardjono, 2003: 56). However, in this study, the development of teaching materials was only at the stage of recording in the journal, transferring books to the general ledger and making a trial balance. This is because the development of teaching materials is focused on the direct practice of analyzing transaction documents in journaling.

2 Method

This research is a development research that uses the Analysis Design Development Implementation Evaluation (ADDIE) model with the product of accounting practicum teaching materials for service companies based on Lectora Inspire. The purpose of this development research is to meet the feasibility and determine the effectiveness of developing accounting practicum teaching materials for service companies based on Lectora Inspire to improve student learning outcomes. This research was conducted in class XI AKL SMK S Al Ikhlas Pangkalan Susu in the 2021/2022 academic year. This research is planned to be carried out in August 2021 which will be adjusted to the school calendar. Data collection techniques are through media expert validation questionnaires, design expert validation and material expert validation. Furthermore, the teacher's response questionnaire, and student response questionnaire and followed the stages of research on the development of the ADDIE model. then experimental research was conducted with a sample of
30 students of class XI AKL 1 as the experimental class, and 30 students of class XI AKL 2 as the control class.

3 Result and Discussion

Product developed in this research is in the form of teaching materials for the-based Service Company Accounting Practicum Lectora Inspire. At the development stage, teaching materials are validated and revised by material experts, media experts, design experts and subject teacher assessments. Furthermore, at the learning stage, trials were carried out through individual trials, small group trials and field trials.

Analysis

In the analysis phase, the researcher analyzes several things which include needs analysis, material analysis and student ability analysis. The analysis stage was carried out to find out the initial picture in order to get information about the learning process at SMK S Al Ikhlas Pangkalan Susu. The analysis phase was carried out through interviews with service company accounting practicum subject teachers and students majoring in accounting and institutional finance at SMK S Al Ikhlas Pangkalan Susu.

Design

The next step in the procedure is the development of the ADDIE model of the design phase, the design phase include making based teaching materials Lectora Inspire with materials General Journal, Ledger and Trial Balance.

This stage is carried out so that the teaching materials developed obtain maximum results with the following preparations:

a. Reading literature or sources regarding the procedures for making teaching materials.
b. Determine the learning objectives of the material developed
c. Prepare the materials needed in the manufacture of teaching materials such as cover designs, materials in the form of power points, pictures, learning videos and other supporting materials.
d. The application Lectora Inspire in making teaching materials
e. Making the start page of teaching materials for Service Company Accounting Practicum on the application Lectora Inspire
f. Entering the prepared material into the application Lectora Inspire by using the insert menu then text block in the application.
g. Inserting learning videos that have been prepared into the application Lectora Inspire by using the insert menu then video in the application.

Development

stage of development that the advanced stage of design that has been designed to become a product. Products that have been made must be validated so that they are fit for use. Product validation by experts by three experts, namely material experts, design experts and media experts as well as teacher response questionnaires and were given improvements to the product. The display of service company accounting practicum teaching materials using Lectora Inspire is as shown in the following:

Fig.1. Initial View of Teaching Materials Based Lectora Inspire
In developing-based teaching materials on accounting practicum subjects, the service company class XI AKL has undergone revisions from material expert lecturers, namely the need to improve questions with easy, medium, and difficult categories. Revisions from media expert lecturers are adjusting the background color with the color of the text, adding learning videos and adding music. The revision from the design expert is to provide explanations and examples first so that it is easier for students to work on the questions. The three suggestions from the expert validation have been improved and can be carried out to the next stage.

Implementation

Stage is conducted in XI AKL class of SMK S Al Ikhlas Pangkalan Susu, in this stage, individual experiments are conducted by 3 students, group experiments are conducted by 9 students, and XI AKL class 1 students are conducted by 30 students in field experiments. The purpose of this phase is to understand how students respond when assessing the usefulness of Lectora Inspire-based Accounting Internship Services teaching materials, which were developed by giving students a questionnaire. The given questionnaire consists of 4 rating scales, namely 4 (very good), 3 (good), 2 (inadequate) and 1 (very poor). In addition, during the implementation phase, students’ learning outcomes will be assessed through a test in the form of 20 multiple-choice questions to determine the effectiveness of the developed teaching material.

Evaluation

Stage is completed at each phase of the improvement of showing materials by scientists, assessments are done to get reactions and info, then, at that point, amendments are made to the created instructing materials.

For the aftereffects of the approval of showing materials in view of Lectora motivate, the consequences of the possibility of approval by media specialists are proclaimed "extremely substantial". The consequences of the approval incorporate in view of 6 perspectives, specifically
The aftereffects of the evaluation of the six angles were proclaimed "very valid" with a normal level of 83.25%. The consequences of the achievability of approval by material specialists are pronounced "very valid".

The consequences of the approval incorporate 4 angles, specifically the appropriateness of learning targets, material quality, show of material substance, show of self-assessment. The consequences of the appraisal of the four viewpoints were pronounced "extremely legitimate" with a normal level of 88.25%. The aftereffects of the attainment of the approval by the plan master were announced "exceptionally legitimate". The aftereffects of the approval incorporate 3 perspectives, in particular the plausibility of content, show, and illustrations.

The aftereffects of the evaluation of the three viewpoints were pronounced "extremely legitimate" with a normal level of 93%. The consequences of the bookkeeping subject educator's evaluation of the bookkeeping practicum showing materials for administration organizations in view of Lectora Inspire are expressed to be "generally excellent" with a normal level of 94%. The consequences of the preliminary evaluation of understudies were done in 3 cycles, to be specific individual preliminaries, little gathering preliminaries, and field preliminaries. The singular preliminary outcomes were proclaimed "awesome" with a normal level of 91.75%.

The outcomes got from the little gathering preliminary were expressed to be "excellent" with a level of 91.29%. the obtaining of the consequences of the field preliminary was announced "excellent" with a normal level of 91.05%. So the Lectora Inspire-based instructing materials that have been created are announced "suitable". As exploration utilizing the Lectora rouse application led by Rahmawati (2020), the outcomes show that the approval of material specialists is 89.13% in the "truly practical" classification, media master approval is 84.89% in the "truly plausible" class, and got a score of 94.22% from understudy reactions in the "extremely getting" class.

To decide the adequacy of bookkeeping practicum showing materials in view of Lectora Inspire whether it is viable in further developing understudy learning results for class XI AKL at SMK S Al Ikhlas Pangkalan Susu. Prior to applying the showing materials, a pretest was led for the two example bunches that still up in the air, in particular class XI AKL 1 was alluded to as the test class, while class XI AKL 2 was alluded to as the control class. Every one of the two example classes was given the equivalent pretest questions, to be specific 20 different decision questions. The accompanying table presents the consequences of the pretest and posttest brings about the table below:

<table>
<thead>
<tr>
<th>Class</th>
<th>The average pretest Value</th>
<th>Average Value Postes</th>
<th>Achievement KKM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Class Experiment</td>
<td>52.67</td>
<td>81.50</td>
<td>100%</td>
</tr>
<tr>
<td>2. Control</td>
<td>50.50</td>
<td>61.17</td>
<td>23.33%</td>
</tr>
</tbody>
</table>

From Table 1 shows the normal worth posttest and accomplishment of KKM test class is higher than the control class. Where the normal post-test score for the exploratory class is 81.50 with a KKM accomplishment of 100 percent, while the normal score for the control class is 61.17 with a KKM accomplishment of 23.33%. What's more, table 1 shows the normal worth of understudies prior to utilizing the created showing materials, which is 52.67 while the normal worth of understudies in the wake of utilizing the created showing materials increments to 81.50. So it very well may be reasoned that understudies in the exploratory class have higher learning results than the control class and understudy learning results in the test class have expanded.

For the essential investigation test, then, at that point, the two examples were tried for ordinariness to see if the two examples came from information that were regularly appropriated. With the assistance of SPSS application are introduced in the table 2.
Table 2. Results Normality Test and Experiment Class Class Control

<table>
<thead>
<tr>
<th>Class</th>
<th>Data</th>
<th>Sig</th>
<th>A</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>Pretest</td>
<td>0.105</td>
<td>0.05</td>
<td>normal distribution of data</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>0.174</td>
<td>0.05</td>
<td>normal distribution of data</td>
</tr>
<tr>
<td>Control</td>
<td>Pretest</td>
<td>0.200</td>
<td>0.05</td>
<td>Data Posttest Normal</td>
</tr>
<tr>
<td></td>
<td>Distribution</td>
<td>0.115</td>
<td>0.05</td>
<td>Data Normal Distribution</td>
</tr>
</tbody>
</table>

Based on Table 2 above, it can be seen that the pretest and posttest data for the experimental class and control class have a probability value > 0.05. The experimental pretest data is 0.105 > 0.05, the experimental posttest data is 0.174 > 0.05, the control pretest data is 0.200 > 0.05 and the control posttest data is 0.115 > 0.05. Thus it can be concluded that the results of the pretest and posttest of the two classes are normally distributed. Furthermore, the homogeneity test is presented in the table below:

Table 3. Homogeneity Test

<table>
<thead>
<tr>
<th>Levene Statistics</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.485</td>
<td>3</td>
<td>116</td>
<td>.222</td>
</tr>
</tbody>
</table>

From Table 3 above shows the results of the homogeneity test using the Levene method, the significance value of the experimental pretest and control pretest results is 0.222. Therefore, the sig value of 0.222 > 0.05, it can be concluded that the two samples of the experimental experimental class and the control class are homogeneous. Furthermore, hypothesis testing using the Independent Samples Test is presented in the table below:

Table 4. Results of t-Test Experiment and Control Class

<table>
<thead>
<tr>
<th>Learning Outcomes</th>
<th>Equal Variances assumed</th>
<th>Equal Variances not assumed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>.57</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>20,333</td>
</tr>
<tr>
<td></td>
<td>10,700</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>192</td>
<td>.000</td>
</tr>
</tbody>
</table>

Considering Table 4 over that the P-esteem (Sig.2-followed) of 0.000 <0.05. Since the worth of sig.2-followed is not exactly = 0.05, there are contrasts in learning results when being dealt with utilizing showing materials considering Lectora motivate. In this manner the showing materials created are successfully utilized in learning exercises.

4 Conclusion

Development of bookkeeping practicum showing materials for administration organizations in view of Lectora rouse to further develop understudy learning results has been created through the ADDIE improvement model. These showing materials have been created beginning from the phase of examining the necessities of understudies and educators, endlessly planning the system of showing materials, item approval by specialists by three specialists, in particular material specialists, plan specialists and media specialists as well as instructor reaction surveys and given enhancements to the item. For the consequences of Lectora Inspire-based showing materials from material master approval, to be specific 88.25% with an exceptionally legitimate classification, approval of media specialists, 83.25% with an extremely substantial class, 93% approval by plan specialists with exceptionally substantial measures. For the approval of the educator's reaction survey, the outcomes acquired a normal score of 94% in the excellent class, the singular test with a normal score of 91.75%, the little gathering test 91.29% in the awesome classification and the huge gathering preliminary 91.05% was in the excellent class. Lectora rouse based showing materials are viewed as very viable in further developing understudy learning results for class XI AKL SMK S Al Ikhlas Pangkalan Susu TP 2021/2022 seen from the consequences of the autonomous example T-test examination acquired an importance worth of 0.000 <0.05 so there is a distinction in the expansion in learning results the test class using media Lectora move and the control class without using media Lectora motivate, hence it tends to be inferred that bookkeeping practicum showing
materials in light of Lectora move are "successful" utilized in bookkeeping figuring out how to further develop understudy learning results. As Novianti (2016:4) states that showing materials play a significant part in deciding learning results. Kemp and Dayton (in Rusman, 2013:168) express that the utilization of learning media has a commitment to the turn of events and improvement of learning. Supporting exploration directed by Saadah (2016) shows the consequences of the autonomous example T-test investigation acquired an importance worth of 0.015 <0.05 so it very well may be presumed that there is a distinction in the improvement of learning results in the trial class using media Lectora move and the control class without using media Lectora move.

Acknowledgment

Author would like to thank all those who have helped and supported the researcher in completing this research. Hopefully the results of this research will be useful for many people, especially the authors and the research site. The authors also thank the supervisors and validation lecturers who have provided input and suggestions for the perfection of this research.

References

Collaborative Nested Action Research (C-NAR): Effective Approach Produces Reflective Teachers in Elementary School

Faisal Faisal1, Lala Jelita Ananda2, Stelly Martha Lova3, Try Wahyu Purnomo4
{faisalpendas@gmail.com}
Faculty of Education, Universitas Negeri Medan, Indonesia1,2, Faculty of Social Humanities and Education, Universitas Haji Sumatera Utara, Indonesia3

Abstract. This study aims to describe a collaborative mentoring model in producing reflective teachers in elementary schools. This type of research is continuous classroom action research with Collaborative Nested Action Research (C-NAR) design. In its implementation, in addition to practitioners conducting classroom action research, lecturers and civil servant teachers conduct mentoring action research. The subjects in the study were 2 students of pre-service teacher professional education (PPG Prajabatan) at the Universitas Negeri Medan. Data collection techniques were carried out through observation and 3-way conferences (lecturers, tutors, and practitioners). The instruments used are observation sheets and reflective journals. Research data were collected and analyzed using a qualitative approach. The results showed that the C-NAR approach was able to produce reflective teachers. In this case, the practitioner continues to make continuous improvements in each lesson based on the shortcomings or failures of previous learning. Based on these findings, C-NAR is said to be effective in facilitating practitioners to become reflective teachers in elementary schools by innovating continuous improvement in each lesson.

Keywords: C-NAR, collaborative, reflective teacher, elementary school

1 Introduction

Law Number 14 of 2005 concerning Teachers and Lecturers Article 8 explains that teachers are required to have academic qualifications, competencies, educator certificates, physically and mentally healthy, and have the ability to realize national education goals [13]. In response to this, the Ministry of Education, Culture, Research and Technology continues to improve the qualifications and competencies of teachers in Indonesia. In this case, teachers must continuously improve pedagogic competence, professional competence, personality competence, and social competence in order to carry out their roles and duties to the fullest [2], [3], [4], [9].

One of the important elements of increasing educational qualifications for teachers is to have an educator certificate as a professional teacher. Currently, efforts that can be made to obtain an educational certificate as a professional teacher are through professional education. In Law Number 12 of 2012 concerning Higher Education Article 17 paragraph (1) states that professional education is higher education after a bachelor's program that prepares students for jobs that require special skill requirements [12]. Therefore, professional education can be carried
The Teacher Professional Education Program in Indonesia is organized by the Education Personnel Education Institute (LPTK) with reference to teacher education standards and national education standards. In this case, it is explained that improving the quality of teachers cannot be separated from the LPTK as the central figure in the implementation of the Teacher Professional Education program. In carrying out its role, LPTKs are given full authority to innovate in preparing professional teachers in Indonesia, especially with regard to the Teacher Professional Education program [1].

One of the important elements in the implementation of the Teacher Professional Education program in Indonesia is the implementation of Field Experience Practices. In this case, the innovation of implementing field experience practices greatly influences the improvement of the competence of professional teachers in Indonesia. The importance of innovation in the practice of field experience can be seen through previous studies, including: (1) Mustaqim (2017) in his research explains that there is a need for an innovation, especially the design of curriculum management for field experience practices through the formulation of success criteria and learning plans for field experience practices so that they become standard guidelines for civil servant teachers and lecturers in educating students [7]; (2) Muhroji (2014) provides an overview and suggestion in the form of innovation in the use of an integrated/collaborative management model in the implementation of field experience practices with partner schools as a place for implementing field experience practices [5]; (3) Mujianto & Sidjalil (2020) explained that classroom management strategy innovation requires the teacher's communicative competence in creating and maintaining a classroom atmosphere (condition) so that learning activities can take place efficiently [6]; (4) Quddus (2019) provides alternative suggestions for the importance of technology-based management and design in learning [10]; and (5) Sunaryo, Zuriah, & Handayani (2020) research illustrates that student readiness in taking PPL is built due to learning factors on campus, teaching experience at home schools, and acceptance of partner schools [11].

Based on the research findings above, the State University of Medan takes part in improving the quality of the implementation of teacher professional education programs in Indonesia. Lecturers and civil servant teachers are assigned to carry out various innovations and new breakthroughs in guiding students of Teacher Professional Education so that they can carry out various activities, especially effective field experience practices at partner schools. With this innovation, it is hoped that it can produce reflective teachers by continuing to make continuous improvements so that they become professional teachers in the future.

One of the mentoring innovations carried out is applying the C-NAR (Collaborative Nested Action Research) approach in mentoring. In this case, in addition to students conducting classroom action research, lecturers and tutors carry out ongoing mentoring actions. Through the C-NAR approach, students will become reflective teachers because they continue to make learning improvements. Meanwhile, lecturers and tutors will become reflective mentors because they continue to improve their mentoring.

2 Research Methods

This type of research is continuous classroom action research with a Collaborative Nested Action Research approach or commonly abbreviated as C-NAR. This type of research was introduced by the Tanoto Foundation (TF) Smart Program. In its implementation, in addition to guiding and directly involved in Classroom Action Research by practitioners, lecturers and
tutors also conduct Guidance Action Research to find the best and sustainable ways or innovations in carrying out mentoring. With this approach, students, lecturers, and tutors are expected to become reflective teachers and mentors so as to produce continuous improvement both in each lesson and in every mentoring.

This research procedure was carried out in 4 stages, namely: Design (D), Implementation (I), Observation (O), and Reflection (R) or commonly abbreviated as DIOR. (1) Design phase, students design learning based on student analysis, readiness of facilities and infrastructure, and current conditions of learning in schools implementing field experience practices. Meanwhile, the tutors and tutors design the mentoring pattern that will be carried out in the mentoring process, both during guided teaching and in independent learning. (2) Implementation, students carry out the learning process in accordance with the previously prepared learning design. Meanwhile, lecturers and tutors carry out the mentoring process according to the previous plan. (3) Observation, students note the suitability of the implementation of learning with the lesson plans that have been prepared. At the same time, lecturers and civil servant teachers observe and record the success of the previous mentoring which is associated with the success of the practitioner in teaching. (4) Reflection, students, lecturers, and civil servants conduct joint reflections related to the success of the learning process carried out.

The time of the research was carried out in the even semester of the 2020/2021 Academic Year starting from January to June 2021. The location of the research was carried out at SD Negeri 023891 Binjai, Binjai City, and SD Negeri 165717 Padang Hulu, Tebing Tinggi City, North Sumatra Province.

The data used in this study is qualitative data from the continuous mentoring process. Data collection techniques were carried out through observation, interviews, and documentation. Data collection techniques were carried out through observation sheets, interview guidelines, and documentation. Data analysis used is qualitative data analysis with the stages of data collection, data reduction, data presentation, and drawing conclusions.

3 Results and Discussion

3.1 Results

The research was carried out for 3 cycles with the stages of Design (D), Implementation (I), Observation (O), and Reflection (R). An overview of the implementation of the D-I-O-R cycle I to cycle III can be seen in the following description:

In simple terms, the implementation of D-I-O-R cycle I can be seen in Table 1 below.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Design (D)</th>
<th>Implementation (I)</th>
<th>Observation (O)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The tutor teacher is not from a partner school</td>
<td>Carry out guided teaching with the help of Partner Teachers &amp; design blended learning (some face-to-face limited, part online learning)</td>
<td>Carry out guided teaching practices with the help of Partner Teachers &amp; carry out guided teaching practices with their respective styles and characters that are tailored to the school’s carrying capacity</td>
<td>Guided teaching learning I went according to plan, but there were obstacles because the tutor teacher was not present in the lesson so that it...</td>
</tr>
</tbody>
</table>
was not in accordance with the reinforcements in the guidance. Another problem is that the division of the roles of civil servant teachers (75%) and students (25%) cannot be achieved.

**Reflection (R):**
It is necessary to improve the pattern of guided teaching practice I by involving the tutor teacher in direct learning.

A simple description of the implementation of Cycle I learning can be seen in Figure 1 below.

![Implementation of Learning Cycle I](image)

**Fig.1. Implementation of Learning Cycle I**

The implementation of D-I-O-R Cycle II can be seen in detail in Table 2 below.

**Table 2. D-I-O-R 2**

<table>
<thead>
<tr>
<th>Problem</th>
<th>(1) The civil servant teacher does not come from a partner school; (2) The teaching practice of Cycle I was less than optimal because the practice was not in accordance with the previous guidance; and (3) The division of the roles of civil servant teachers (75%) and students (25%) did not work.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design (D)</td>
<td>Designing learning by presenting tutors through learning videos. Matters related to assignments (Student Worksheets and Assessments) are assisted by students in learning.</td>
</tr>
<tr>
<td>Implementation (I)</td>
<td>Blended learning is carried out by showing video tutoring tutors through infocus so that the division of roles of civil servant teachers (50%) and students (50%) can be achieved.</td>
</tr>
<tr>
<td>Observation (O)</td>
<td>Guided teaching and learning with the blended learning pattern went well, but there were problems related to the interaction of the tutor with students and the level of understanding of the students based on the explanation of the tutor teacher because it was only through learning videos.</td>
</tr>
</tbody>
</table>
Reflection (R) : It is necessary to bring the tutor teacher directly in learning so that there is a two-way interaction.

The portrait of the implementation of Cycle II learning can be seen in Figure 2 below.

Fig.2. Implementation of Cycle II Learning

The implementation of D-I-O-R Cycle III can be seen in detail in Table 3 below.

<table>
<thead>
<tr>
<th>Table 3. D-I-O-R 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem</strong></td>
</tr>
<tr>
<td><strong>Design (D)</strong></td>
</tr>
<tr>
<td><strong>Implementation (I)</strong></td>
</tr>
<tr>
<td><strong>Observation (O)</strong></td>
</tr>
<tr>
<td><strong>Reflection (R)</strong></td>
</tr>
</tbody>
</table>

A simple description of the implementation of Cycle III learning can be seen in Figure 3 below.

Fig.3. Implementation of Cycle III Learning (Virtually Presenting Tutors and Lecturers)
3.2 Discussion

Research with the C-NAR approach has produced teachers who are reflective in implementing field experience practices in the Teacher Professional Education program at the State University of Medan. The success of the C-NAR carried out can be described as follows.

D-I-O-R 1:

The problem experienced is that the tutor teachers do not come from partner schools. This problem is carried out by learning innovations in the form of carrying out learning with the help of partner teachers at schools where field experience practices are carried out. This learning pattern creates a problem where the distribution of tutors and students according to the plan is not implemented. Thus, learning innovation is carried out by involving the civil servant teacher directly in learning.

D-I-O-R 2:

In Cycle II, learning was carried out by involving the civil servant teacher directly. Efforts are being made to present learning videos for civil servant teachers that are broadcast through infocus. As a result, learning goes according to plan. However, the process of student interaction with the civil servant teacher did not occur so that they were unable to communicate directly with the tutor teacher. In this case, the next cycle of learning innovation is carried out by presenting the tutor directly.

D-I-O-R 3:

Learning is done by presenting virtual tutors through infocus shows. In this way, students, students, and tutors and lecturers can interact directly, even though virtually. This is seen as one of the effective efforts in guided learning in the current pandemic era. Based on several continuous improvements made above, a comprehensive picture of the field experience practice with the C-NAR approach is obtained. Where, in addition to students making improvements to learning, lecturers and tutors continue to improve mentoring. Thus, it can be concluded that the implementation of learning in the teacher professional education program can run as expected, especially in producing reflective teachers by making continuous improvements in accordance with the problems encountered in learning.

4 Conclusion

The C-NAR approach in guiding the practical experience of the teacher professional education program has been successfully carried out. The mentoring process is carried out through 3 cycles of activities, namely DIOR 1, DIOR 2, and DIOR 3. Based on the research findings it can be concluded that the C-NAR approach requires students to improve learning in the form of continuous classroom action research and requires lecturers and tutors to improve mentoring in form of continuous mentoring action research. With the C-NAR approach, reflective teachers and mentors are produced by making continuous improvements from time to time.

References

Education In The 21st Century Hots (Higher Order Thinking Skills) In Religious Literacy

Farida Win Sari Manurung1, Winning Amintas Kartika Waruwu2, M. Joharis Lubis ³, Sukarman Purba⁴
{faridamanurun39@gmail.com1, winningwaruwu95@gmail.com2, joharislubis@yahoo.co.id³, arman_prb@yahoo.com⁴}

SMK Negeri 1 Percut Sei Tuan1, AKPER Kesdam I/BB Medan2, Universitas Negeri Medan34

Abstract. One of the critical qualities that 21st-century learning promotes is Higher Order Thinking Skills. This Community Service project's goal is to provide knowledge in the fields of science, technology, and the arts, as well as findings from research, creation, development, and dissemination of science and technology based on current educational trends. Students can improve their ability to do so by familiarizing themselves with HOTS-based questions. The purpose of this study is to find out how much knowledge and experience people have with using higher order skills, also known as HOTS, to improve religious literacy. Pearson's correlation is used in the quantitative approach to determine the adjacency of the relationship between religious literacy and Higher Order Thinking Skills ability.

Keywords: HOTS (Higher Order Thingking Skills) and Religious Literacy

1 Introduction

Education has entered a period of global competitiveness, requiring teachers and students to improve their skills and capacities, particularly in religious topics. Information about educational scientific progress has not been widely disseminated, particularly in the area of SMK Negeri 1 Percut Sei Tuan, Deli Serdang Regency.

The role of the teacher as a transmitter of information and the requirement for up-to-date information that can be applied to the teaching and learning process are the foundations of this study. Information regarding the most recent changes in the national curriculum was collected through interviews with ten instructors in the Deli Serdang area, however classroom teaching has not yet shifted to reflect the rules of the National curriculum. Other material gathered by teachers is still insufficient to fully comprehend how to create and implement HOTs.

The Deli Serdang district administration has collaborated with the education office to carry out coaching and training activities for teachers in Deli Serdang in phases, according to the survey results. Only a few teachers have gotten direction and training on the National curriculum, particularly in HOTs and Literacy materials, and this work is currently underway.

The goal of Community Service (PKM) is to align with the goal of curriculum improvements, which is to improve students' (Students') responses to global influences that may have an impact on their character. This is in accordance with the expectations of twenty-first-century education, which requires technology-based learning to balance the demands of the millennial age with the objective of later pupils becoming accustomed to twenty-first-century
life skills. Students in the twenty-first century must grasp science, metacognitive skills, be able to think critically and creatively, and successfully communicate or interact; this circumstance exemplifies the gap between expectations and realities. This research limits the difficulties as follows, based on the problem's background:

a. I'd like to know how well-versed the teachers in Deli Serdang are in making HOTs inquiries and religious literacy.

b. To learn about the instructors' reactions and knowledge after attending the seminar at SMK Negeri 1 Percut Sei Tuan.

2 Research Methods

The implementation of this activity uses the Deductive training method. The training model is used with the consideration that this training model is built on the need for capacity building, expanding information and the ability of an institution to apply it in field work practice. When a training model can be built around a curriculum, approaches, and strategies that are tailored to the target students' learning needs and the problems they face, as well as consideration for all training participants, it is considered effective (targets). The identification results are thought to be needed for all training participants who have the same characteristics in this case are teachers. The identification results are used in compiling mass and comprehensive training (learning) materials. In this study, the trainees were teachers with a teacher education background.

This research is an experimental research with a form of implementation that is a quasi-experimental research (quasi-experimental research). Location and time of this research was conducted at SMK Negeri 1 Deli Serdang Regency on September 2021.

Other improvements to the assessment standard were made as well, with the international standard assessment model being gradually adopted. Assessment of learning outcomes is expected to aid students in improving their higher order thinking skills because higher order thinking encourages students to think broadly and deeply about the subject matter (HOTS).

3 Conclusion

The Spearman Rank correlation is used in data analysis to measure the impact of the training results on the trainee teachers' final knowledge. The Spearman Rank correlation coefficient formula is used to determine the degree of correlation. The Spearman Rank correlation test was utilized in this investigation, with a significance level of 5%.

The following is how the hypothesis is stated:

Ho: The training's outcomes have no positive impact on the trainee teachers' final knowledge.

The Brain Based Learning paradigm has a favorable impact on pupils' mathematics connecting abilities. The impact of the training on the trainee teachers' final knowledge.

References


Analysis of Learning Media Needs in a QR-Code Assisted Chemistry Laboratory as an Innovation in the Use of Student Digital Technology

Isnanik Juni Fitriyah\textsuperscript{1}, Munzil\textsuperscript{2}, Yessi Afriyenni\textsuperscript{3}, Erti Hamimi\textsuperscript{4}
{isnanik.fitriyah.fmipa@um.ac.id}
Universitas Negeri Malang, Jalan Semarang 5, Malang 65145, Indonesia\textsuperscript{1234}

Abstract. The industrial revolution 4.0 requires the younger generation to be proficient with technological developments. This study aims to describe the importance of providing technology-based learning media in the form of QR Code in the chemistry laboratory. This research is qualitative research. The research data is qualitative data which is analyzed descriptively. Data collection techniques by means of literature study, observation and interviews. The results showed that the learning media in the laboratory had not used elements of technology such as QR codes. QR code can be an innovation of learning media in the laboratory in the form of accessing chemical information in a more interesting and faster way. The conclusion of this study is that the innovation of learning media in the laboratory with the help of a QR code needs to be developed to improve students' skills in using technology while increasing interest in learning.

Keywords: Application, Laboratory, Learning media, QR Code, Technology.

1 Introduction

The development of the 21st century world has led to the flow of globalization throughout the world [1]. The rapid development of technology, information, communication to culture has led to the need for human resources that develop in accordance with the times [2]. In seeking to increase human resources, it is necessary to prepare a young generation who is capable of technology [3], [4].

To improve the skills of the younger generation in terms of technology, it can be done by habituation from an early age to use technology for various things, including in the world of education [5]. In the world of education, technology can be used in various activities ranging from the learning process with teaching materials or technology-based learning media and exam activities by utilizing technology [6]. The use of technology-based learning media can not only trigger technological skills, but also have a positive effect on learning processes and outcomes such as increasing learning motivation and improving student learning outcomes. This of course happens because now many young people are familiar with technology from an early age, such as smartphone technology [7], [8].

One of the technologies applied in learning media is a mobile application with the QR Code principle. QR Code stands for Quick Response. This means that the QR code can access information quickly [9]. In practice, QR codes can provide information to users through a fast-scanning process (within seconds). The use of this technology is mobile-based [9], [10] A smartphone application is required to start running the QR Code process. Currently, there are
many applications of QR Codes in the world of education [11], [12]. Examples are the QR code as an information display in the Green Technology module in Malaysia [9] and the QR code for learning media on the topic of table tennis [12].

Learning media is needed in lectures [13]. For students of the Science Education Study Program, as prospective science educators, students are needed who not only understand the material in terms of theory but also practice [14]. Therefore, practical activities are also carried out in the laboratory. In the laboratory, there are many learning resources that also act as learning media, one of the most basic of which is chemicals [15]. Chemicals are stored in containers in the form of bottles, commonly called chemical bottles. Chemicals have many varieties with different specifications. There are some chemicals that are dangerous. Therefore, information about chemicals is very important to be conveyed to students and included in the bottle itself.

Based on the description above, this study aims to reveal the use of learning media in the Chemistry laboratory and analyze the importance of developing chemical bottle learning media with a QR code label as a trigger for student digital literacy. It is hoped that this research can be the basis for research on the development of learning media with QR codes, so that it can be an innovation of learning media and improve students’ digital technology skills.

2 Method

This research is a type of qualitative research. Sources of data come from primary and secondary data. The primary data collected is the condition of the science laboratory in terms of learning media models, student responses to lectures and learning media in the laboratory and student characteristics. For secondary data, the data collected is the feasibility of QR Code technology for learning media. The primary data collection technique was by distributing questionnaires via Google Form to 34 students and 2 lecturers of Basic Chemistry I. Meanwhile, the secondary data collection technique was by conducting literature studies from journal article sources and scientific proceedings.

The research data analysis technique is descriptive analysis. The results of the data, both for primary or secondary data will be related to each other descriptively. Thus, it will produce scientific conclusions. The stages of the research carried out were the determination of the title, planning, implementation and evaluation. At the planning stage, research preparation is carried out in the form of determining the subject and making a questionnaire instrument. At the implementation stage, questionnaires were distributed to research subjects and literature studies. At the evaluation stage, the results of the questionnaire were analyzed using literacy, then the conclusions of the research were carried out.

3 Results and Discussion

3.1 Chemical Bottles as Learning Media in the Laboratory with Conventional Labels

Questionnaires containing questions have been distributed to 34 students of the Science Education Study Program semester 1 and 2 lecturers. Based on the questionnaire, the conditions of lectures at the Science Education Study Program in terms of laboratories are as follows:

a. Practical activities in the laboratory are always carried out by students every semester such as practicum in Basic Chemistry I, Basic Chemistry II, Compound Elements and Physical Chemistry courses.

b. In the laboratory, chemicals are stored in chemical bottles as learning media.
c. Information about chemicals in the form of acids or bases is included in the label affixed to the wall of the chemical bottle.

Based on the results of these answers, it can be stated that the Science Education Study Program, State University of Malang has implemented lectures that require students not only to understand theoretically but also practically. This is in accordance with Rumiyati et al. (2017) with the nature of science learning, one of which is the science process [16]. Practical activities in the laboratory are important for science students to build a more meaningful understanding and improve science process skills such as calculating, designing and proving.

Data were also collected regarding student responses to lectures in the laboratory. The results are shown in Table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Statements</th>
<th>Answers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>Students like activities in the laboratory</td>
<td>97.05</td>
</tr>
<tr>
<td>2</td>
<td>Chemistry practicums often involve chemicals in chemical bottles</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Information about chemicals is very necessary to be included in learning media</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Students are interested in learning media with QR code</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on Table 1, it can be concluded that students like practicum activities in the laboratory. This is the same as the research conducted by Candra & Hidayati (2020), that students tend to prefer action activities rather than just hearing or learning about theory in regular classes [17]. Action activities such as practicum in the laboratory can provide a more pleasant atmosphere and stimulate students' motor skills.

Based on Table 1, it can be seen that the chemicals in the chemical bottle have become a familiar learning medium in the laboratory. Of course, the chemicals in the bottles are of various types with each specification such as the level of danger and storage methods that need to be considered. Through this questionnaire, it is also possible to find out information regarding the inclusion of chemical specifications contained in labels in the form of paper attached to the walls of chemical bottles. This is good for basic understanding and as providing information to students when they want to use the material.

However, there are times when there are small chemical bottles with labels containing full specifications of chemicals that are long and wide. This causes the writing of specifications in the label to be made small so that the label can contain all the information. This can cause user discomfort while reading. In addition, there are many unexpected events that can occur in the laboratory which can accidentally damage the written label such as getting wet with liquid. Therefore, here it would be very good if there was an innovation of chemical bottle learning media in terms of labeling.

3.2 The Importance of Learning Media Innovation in a QR Code Based Laboratory

Learning media is one of the learning tools available to support the implementation of learning activities [18]. The selection of the type of learning media is adjusted to the needs of the subject of study, namely students. The trend of learning media continues to change over time.
and the development of the times. Technological developments now require the use of innovative technology in lectures [19].

It is known that the digital skills of the younger generation need to be improved, including in students of the Science Education Study Program. Therefore, the learning media used in lectures also need to include the application of forms of technology. Based on the research results, in the Chemistry laboratory in Science Education, the chemicals in bottles have become a learning medium that is often used. These learning media innovations can be improved with the help of technology that can display complete and interesting information about chemical specifications without being limited by the shape of the size of the chemical bottle. The technology that can be used is called QR code.

Based on the questionnaire filled out by the Science Study Program lecturers, it resulted that 2/2 lecturers stated that learning media needed to be designed in such a way as to improve students' technological skills. This is the same as the results of the study of Savitri et al. (2021) that the selection and design of learning media needs to be synergized with technology to get used to using technology as preparation for the industrial revolution 4.0 [20]. Then, 2/2 lecturers also agreed that the innovation of learning media in technology-based laboratories could be done by designing QR code-based chemical labeling.

In this case, the QR code is capable of displaying information regarding chemical specifications, such as the name of the chemical, chemical physics properties, hazard information, storage methods and efforts for accidents in the laboratory. More complete information about chemicals is usually contained in data called material safety data sheets (MSDS). The way this information is displayed is by scanning a QR code image in the form of an arrangement of black and white blocks using a scanner application [21].

Within a fraction of a second, various menus of chemical information options to choose from will appear. This is certainly more effective in displaying wider information than information on conventional paper labels that have limited space. Learning media such as QR Code need to collaborate with design and application developers. Design for designing QR Codes and applications for designing and creating applications that can later be installed on smartphones.

Based on the description that has been conveyed, it can be drawn an outline that labeling with a QR code is necessary and important to be developed for chemical learning media in bottles as an innovation of learning media and training digital technology skills. With this kind of learning media, it is also hoped that it can increase student learning motivation.

4 Conclusion

Based on the research that has been done, in the Chemistry laboratory there are chemicals in chemical bottles which are general learning media. The development of chemical learning media in chemical bottles needs to be done to improve students' digital technology skills as a provision for the industrial revolution. QR code technology can be an interesting development for chemical labeling that can display chemical specifications more completely and quickly.

Acknowledgments

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References


Overview of Minority Student Adjustment at Universitas Negeri Medan

Nur’aini1, Utami Nurhafsari Putri2, Miswanto3
{mrsnuraini545@gmail.com}

Universitas Negeri Medan

Abstract. Every student needs adjustment in college life, including minority students at Universitas Negeri Medan. This study was conducted to see the picture of the adjustment of minority students at the Universitas Negeri Medan. Data were collected using self-administered questionnaires and analyzed using Descriptive Analysis (percentage). The findings of this study indicated that overall, 18 students had adjustment problems. Based on the results of the analysis of 4 aspects of adjustment, 21 students experience personal adjustment problems, 18 students experience social adjustment problems, 20 students experience academic adjustment problems, and 12 students experience agency adjustment problems.

Keywords : Minority Student, Adjustment

1 Introduction

Education in Indonesia, especially at the higher education (PT) level, is expected to produce students with diverse abilities. This is in line with the purpose of national education stipulated in Law No. 20 of 2003 and Article 3 of the National Education System and states as follows. Fearing the Almighty God, he is a noble, healthy, knowledgeable, competent, creative, independent, democratic and responsible citizen. Academic education has a learning process that requires interaction between students.

When interacting with the requirements of the campus environment, students must adjust their needs, expectations, and requirements on their own. If there are students on campus, they must face a different environment than they have experienced before. It is not uncommon for someone to experience the process of a culture shock when dealing with an environment that is different from the previous one.

Searle and Ward (Chapdelaine and Alexitch, 2004) explain that culture shock is an adaptive requirement that individuals face at the cognitive, behavioral, emotional, social, and physiological levels when a person is transferred to another culture. doing. When students first interact in these diverse environments, one person usually feels strange and different from the others. Yuniardi and Dayaksini (2008) explain that students who leave their hometown in a short period and settle in a new area can harm students outside the island, including communication problems due to differences. language. This adverse effect affects his mental state.

Due to diverse cultural backgrounds, it is clear that students from outside North Sumatra have become minority students of higher education, especially local cultures that develop in the local Batak culture. Adapting to the campus environment is a constant process for students from outside North Sumatra. For example, differences in speech/language, skin color, values and norms, climate, that require adequate skills and abilities. To be able to adapt, under certain
conditions to make appropriate adaptations. Student adaptation or adaptation processes are the
supporters for helping students integrate into other communities. Schneiders (Agustiani (2006:
146147)) explains that self-regulation is a process that involves mental and behavioral
responses. This is an effort to successfully overcome the needs, tensions, conflicts, and
frustrations experienced by an individual.

We aim to harmonize and harmonize our demands with the expectations of the environment.
Adaptable people are those who are limited, mature, useful, efficient, learn to be content with
themselves and their surroundings, and experience conflict, frustration, personal and social
without experiencing behavioral problems. People who can adapt to difficult situations. The
adaptation process of non-Sumatra students is influenced by many factors. Fatimah (2010)
found that the coordination process is strong in factors that determine personalities themselves,
such as experience factors, learning outcomes, needs, self-actualization, frustration, depression,
family environment, relationships with parents, sibling relationships, and community
environment.

It explains that it will affect performance. Academic and university environment. This study
focuses on the environmental factors of the university. The university environment is an
important element of self-regulation because it acts as a medium for socialization that affects
the intellectual, social, and moral lives of students. The campus atmosphere influences the
process and pattern of adaptation to students, including the minority of Papua. Overseas Papuan
students are immigrants to areas with different cultural backgrounds than their hometowns. For
the first time, international students are coming to a new environment of a different culture and
have problems interacting with other ethnic groups. The process of social interaction is certainly
carried out by Papua students to survive and benefit, to prevent psychological and physical stress
(Listiyanto, 2007).

Due to existing phenomena, students continuing their studies outside the region, including
the Universitas Negeri Medan (UNIMED) campus, also have coordination problems.
Coordination issues can interfere with their learning experience. Foreign and foreign students
of the Papua ethnic group have particular problems adapting to different languages and cultures
in their respective regions.

It is important to adapt to a new culture that helps them work effectively in all situations.
Based on the above explanation, the problem arises in the adaptation of minority students.
Researchers are interested in research on the theme of "Overview of Minority Adaptation at
Negeri Medan University". Researchers would like to see an overview of minority adaptation
at Universitas Negeri Medan so that they can find something that will help them overcome the
situation.

Adjustment

Self-Adjustment in the original language is known as adaptation or personal adaptation.
According to Schneiders (Ali & Mohamad, 2015: 173174), the discussion of the importance of
self-adjustment can be seen from three perspectives: A) Adaptation as an adaptation (adaptation)
Initially, self-adjustment was defined as synonymous with adaptation (adaptation). On the other
hand, this adaptation generally leads to self-adjustment in the physical, physiological, or
biological sense.

Adjustment tends to be interpreted as an effort to defend oneself physically (self-
maintenance or survival). Self-adjustment is defined as the effort to defend oneself, so it is only
in harmony with the physical state, not adjustment in the psychological sense. Self-adjustment
is not just a physical adjustment, but a more complex and more important one is the uniqueness
and existence of an individual personality in relation to the environment.; B)Adjustment as a
form of conformity (Conformity) By interpreting self-adjustment as an effort of conformity, it
implies that their individuals seem to be under strong pressure to always be able to avoid deviating behavior, both morally, socially, and emotionally.

Individuals are always aware of compliance requirements and are threatened with rejection if their behavior does not comply with applicable standards. Norms that apply to a particular culture are not the same as those of other cultures, so it is not possible to develop a set of adjustment principles based on a generally accepted culture. The concept of self-adjustment is dynamic and cannot be structured according to social suitability.

C) Adaptation as an effort for mastery (Mastery) The next view is that self-adjustment is defined as the effort of domination, the ability to plan and organize responses in a particular way so that conflicts, difficulties, and frustration do not occur. Self-adjustment is defined as the ability to grow oneself in a way that impulses, emotions, and habits are controlled and directed.

According to Baker & Siryk (1984), the forms of Adjustment in the higher education sector are: A) Personal Customization. It is a natural and dynamic process aimed at altering an individual's behavior to develop better relationships with environmental conditions; B) Social Adjustment: A student can adapt to a campus environment, including how an individual can interact with others in the campus environment. This can be seen in the student's participation in campus activities.

For example, join campus organizations, committees, and research groups. In addition, students maintain good friendships and feel comfortable in the campus environment. In addition, the student's ability to adapt to the emotional and physical problems faced by freshmen. As a freshman, there are undeniable new demands in life, such as separation from family and boarding schools, lifestyle changes, and the characteristics of many other friends; C) Academic Adjustment. Students can adapt to college life and achieve academic performance. This can be seen as a motivation to play at school, get good grades, and be content with the results achieved; D) Institutional Adjustment. Commitment or Engagement is the student's ability to adapt by building bonds with lecture activities and influences their decision to continue learning.

Minority Students

Emphasizing the prevalence of ethnicity, race, groups, cultures, and religions in different parts of the world, minorities are always vulnerable, are discriminated against, are mistreated, become scapegoats, and seem to be dominated by more dominant or majority groups. Some references state that majority groups often act, treat minority groups as subgroups, are discriminated against, and are sometimes treated in the same way as existing cultures.

Minority groups are social units that cannot be named. In almost every country, the existence of a minority in the hegemony of the majority is an undeniable need. Multiple minorities are interpreted because they differ from the majority based on their identities, such as religion, language, ethnicity, culture, and sexual orientation choices. The number is usually not very large compared to the country's population. Therefore, he does not have a dominant position. This subordinate position greatly strengthens the solidarity between members in order to maintain their identities. In addition, these minority units are often separated.

Labeling minority groups has the effect of strengthening identity politics. Identity politics is rooted in the primitive. There are many minority communities in social life in the form of pluralistic societies with different cultures. This minority community can come from inside and outside Indonesian society. The definition of a minority group is not yet generally accepted. However, a common country is a minority group, a group of individuals who do not control the characteristics of a particular country, ethnicity, religion, or language that is different from the majority of the population. As a minority, A "group" is numerically smaller than the rest of the population of a non-dominant country. Their membership exhibits ethnic, religious, and
linguistic characteristics that are different from other population groups, and at least implicit solidarity for the protection of culture, tradition, religion, and language.

When you enter the lecture, you will learn a lot of new things, from education and education system to encounters with cross-cultural people. Of course, for international students, this is a requirement to be able to adapt to different environments of origin. Freshmen need to adapt not only socially, but also to themselves. Of course, customization is not easy. Especially considering the atmosphere, speaking style, and environment that is different from where we live. Adapting to the university environment is a process that every student at the university must perform.

During the coordination process, students encountered both academic and non-academic psychological problems. When it comes to new college environments, students need psychological and social preparation. This is because self-adjustment requires students to live fairly in their environment and to ensure that young people are satisfied with themselves and their environment (Willis, 2005). Students must be able to adapt to new situations and requirements. If student adaptation interferes with college life, it can cause students to leave college (Mudhovozi, 2012).

The impact of existing differences causes difficulties in building social relationships. If the communication pattern is different, the subject avoids communicating with the local population. The customs of the local population will also hinder the subject in promoting social relationships. The theme acknowledges that it is difficult to adapt to the customs of the local population. Integrating the difficulty of communicating with the various customs of the local population is the difficulty of adapting the theme to the environment. Focusing on the need for social acceptance is the subject's desire to overcome various environmentally perceived difficulties. Subjects understand their situation, but it does not always solve existing difficulties.

Themes include learning oral communication, social models as self-adaptation, self-potential as a medium for social adaptation, recognition of rules and norms, efforts for social readjustment, and various efforts to be accepted by local residents. Acting as a need for social acceptance comes from ourselves and the familiar environment that supports self-coordination and society. Along with the process between the difficulty of establishing social relationships and the need for social acceptance, the subject is self-improvement efforts in the form of finding meaning in life by being in line with God, others, and the environment. find. The self-improvement journey experienced by the subject is when they experience difficulties and disappointments in their lives.

This situation promotes awareness of subjects in need to experience relief from the disappointments and difficulties they are experiencing. Subject consciousness is formed by someone who shares an effort to improve themselves through spirituality. To make this decision, share self-improvement efforts through psychological suspicion by the subject. The suspicion that the subject experiences to receive assistance from the nearest environment for self-improvement through spirituality.

Researchers have found it difficult for subjects to adjust. Various backgrounds lead to this situation, such as differences in language and people's lifestyles. Sicat (2011) considers the experience to be an unpleasant experience for the subject, such as language differences, speaking differences, and speaking differences between the original domain and the new domain. Difficulty in interpreting linguistic expressions. Phenomena such as language differences are one of the problems of culture shock and are used to explain the consequences and symptoms of people moving to new areas. Researchers have found it difficult for subjects to maintain social relationships. This is closely related to the negative judgment of society in the new environment.
This situation affects people's perceptions of the new environment and creates discomfort in the environment. Myers (2005) found that these views are sneaky beliefs, negative emotional expressions, or hostile and discriminatory acts by members of the majority group towards members of the minority group in social situations that lead to prejudice. I believe that. The result of this view is that the subject believes in the views of the local population, which leads to the subject's withdrawal from the social environment. The difficulties he experiences affect the subject's survival in the environment.

The consciousness that is formed is not only the object that gives up the state, but also the object that chooses to open up to the environment. Myers (2005) has a powerful influence that reduces the perceived social and emotional burden while the personal environment becomes an individual's resource used to meet social needs. I showed that. The subject's experience is that of the subject in the immediate vicinity. Self-adjustment is the process by which an individual achieves self-balance by meeting environmental needs and eliminating negative emotions. Kartono (AlKarimah, 2015). Now that more and more students are studying in more than half of the places and areas, we need to get used to the new environment.

According to Willis (2011), self-adaptation is the ability of a person to naturally coexist and relate to the environment. Adjustments are made to avoid any obstacles or inconveniences that may occur and find a psychological balance. In this case, it certainly does not cause conflict with itself and does not violate the norms that apply to society. Self-adaptation plays a very important role in helping students learn smoothly. Effective adaptation depends on physical maturity, intellectual, emotional, social, moral, and religious maturity. If one aspect of behavior is immature, it becomes incapable of adapting (Schneider 1964: 82).

2 Research Methods

The research data collection instrument was adjusted to the characteristics of the data to be collected, namely a questionnaire which was developed by the researcher himself. The questionnaire used is a Likert scale model. The questionnaires were then distributed to 27 minority students (Papuans) studying at the State University of Medan. The data analysis technique used is the descriptive data analysis technique using percentages by categorizing the categories as High (T), Medium (S), and Low (R). Determination of categorization is done using the score interval formula. Data analysis was carried out to see a picture of the adjustment of minority students as a whole and to see the picture of adjustment of minority students based on 4 (four) aspects of adjustment.

3 Results and Discussion

According to Baker & Siryk (1984), self-adjustment consists of four aspects: (1) personal adjustment, (2) social adjustment, (3) academic adjustment, and (4) institutional adjustment. Based on the above aspects used as materials for conducting needs assessments (needs surveys) for minority group students, this is shown in Table 1 below.
Table 1. Description of Minority Student Adjustment Data at Universitas Negeri Medan

<table>
<thead>
<tr>
<th>No</th>
<th>Initial</th>
<th>Personal Score</th>
<th>Kat</th>
<th>Social Score</th>
<th>Kat</th>
<th>Academy Score</th>
<th>Kat</th>
<th>Institution Score</th>
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<th>Kat</th>
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<td>T</td>
<td>28</td>
<td>T</td>
<td>38</td>
<td>S</td>
<td>57</td>
<td>T</td>
<td>176</td>
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</tr>
<tr>
<td>2</td>
<td>M</td>
<td>3</td>
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<td>24</td>
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<td>36</td>
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<td>42</td>
<td>S</td>
<td>136</td>
<td>S</td>
</tr>
<tr>
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<td>4</td>
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<td>24</td>
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<td>36</td>
<td>S</td>
<td>42</td>
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<tr>
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<td>28</td>
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<tr>
<td>23</td>
<td>O</td>
<td>4</td>
<td>S</td>
<td>28</td>
<td>T</td>
<td>46</td>
<td>T</td>
<td>58</td>
<td>T</td>
<td>176</td>
<td>T</td>
</tr>
<tr>
<td>24</td>
<td>S</td>
<td>4</td>
<td>S</td>
<td>24</td>
<td>S</td>
<td>38</td>
<td>S</td>
<td>52</td>
<td>T</td>
<td>158</td>
<td>S</td>
</tr>
<tr>
<td>25</td>
<td>B</td>
<td>4</td>
<td>S</td>
<td>26</td>
<td>S</td>
<td>34</td>
<td>S</td>
<td>55</td>
<td>T</td>
<td>161</td>
<td>S</td>
</tr>
<tr>
<td>26</td>
<td>S</td>
<td>4</td>
<td>S</td>
<td>28</td>
<td>T</td>
<td>44</td>
<td>T</td>
<td>64</td>
<td>T</td>
<td>185</td>
<td>T</td>
</tr>
<tr>
<td>27</td>
<td>A</td>
<td>5</td>
<td>T</td>
<td>27</td>
<td>S</td>
<td>49</td>
<td>T</td>
<td>61</td>
<td>T</td>
<td>191</td>
<td>T</td>
</tr>
</tbody>
</table>

Information:

Kat = Category  
T = Height  
S = Medium  
R = Low

Based on the analysis of the table above, the adjustment problems experienced by minority students at the State University of Medan as a whole can be described as follows.

**Description of Adjustment of Minority students as a whole**

The use of Likert scale in collecting data on adjustment of minority students. The description of the data can be seen in Table 2 as follows.
Table 2. Overall Adjustment Frequency Distribution by Category (n=27).

<table>
<thead>
<tr>
<th>Score Interval</th>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>167-227</td>
<td>Height (T)</td>
<td>9</td>
</tr>
<tr>
<td>106-166</td>
<td>Medium (S)</td>
<td>17</td>
</tr>
<tr>
<td>45-105</td>
<td>Low (R)</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>27</td>
</tr>
</tbody>
</table>

From the table above, we can see that most minority students have experienced moderate adjustment, with 17 and 1 in the lower category. In total, 18 students from the minority had coordination problems. See the description of each aspect of self-tuning below for more information.

a. Minority Student Personal Adjustment Description

The use of Likert scale in the collection of personal adjustment data of minority students. The description of the data can be seen in Table 3 as follows.

Table 3. Personal Adjustment Frequency Distribution by Category (n=27).

<table>
<thead>
<tr>
<th>Score Interval</th>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-70</td>
<td>Height (T)</td>
<td>6</td>
</tr>
<tr>
<td>33-51</td>
<td>Medium (S)</td>
<td>19</td>
</tr>
<tr>
<td>14-32</td>
<td>Low (R)</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>27</td>
</tr>
</tbody>
</table>

Based on the table above, shows that most of the minority students experienced moderate and low personal adjustment, namely as many as 21 people.

b. Description of Minority Student Social Adjustment

The use of Likert scale in collecting data on social adjustment of minority students. The description of the data can be seen in Table 4 as follows.

Table 4. Distribution of Social Adjustment Frequency by Category (n=27).

<table>
<thead>
<tr>
<th>Score Interval</th>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>27-36</td>
<td>Height (T)</td>
<td>9</td>
</tr>
<tr>
<td>17-26</td>
<td>Medium (S)</td>
<td>17</td>
</tr>
<tr>
<td>7-16</td>
<td>Low (R)</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>27</td>
</tr>
</tbody>
</table>

Based on the table above, shows that most of the minority students experienced moderate and low social adjustment, as many as 18 people.

c. Minority Student Academic Adjustment Description

The use of Likert scale in collecting data on academic adjustment of minority students. The description of the data can be seen in Table 5 as follows.
| Table 5. Distribution of Academic Adjustment Frequency by Category (n=27). |
|---|---|---|
| Score Interval | Category | Frequency |
| 41-55 | Height (T) | 7 |
| 26-40 | Medium (S) | 19 |
| 11-25 | Low (R) | 1 |
| Total | | 27 |

Based on the table above, shows that most of the minority students experienced moderate and low academic adjustment as many as 20 people.

d. Minority Student Institution Adjustment Description

The use of Likert scale in the collection of minority student institutional adjustment data. The description of the data can be seen in Table 6 as follows.

| Table 6. Distribution of Institutional Adjustment Frequency by Category (n=27). |
|---|---|---|
| Score Interval | Category | Frequency |
| 49-66 | Height (T) | 15 |
| 31-48 | Medium (S) | 12 |
| 13-30 | Low (R) | 0 |
| Total | | 27 |

Based on the table above, shows that most of the minority students experienced moderate and low institutional adjustment, as many as 12 people.

4 Conclusion

Based on the 27 minority respondents who had adjustment problems on campus, the middle and low category had up to 18 (66.66%) and the high category had 9 (33.33%). Based on the aspect of self-adjustment, namely (1) personal adjustment problems of up to 21 people (77.77%), (2) social adjustment problems of up to 18 people (66.66%), (3) largest academic adjustment problems. Up to 20 people (74, 07%), (4) Problems with institutional adjustment up to 12 people (44.44%).

The results of the needs survey found that one respondent had personal, social, and academic adjustment problems. Furthermore, it is recommended to analyze the needs and develop counseling models, both individually and in groups, to regulate the adjustment problems of minority students.

References

Village Status Classification Based Tree Algorithm

Nadhirah Nur Salima1, Ahmad Ilham2
{nadhira@unimus.ac.id1, ahmadilham@unimus.ac.id2}

Department Informatics, Universitas Muhammadiyah Semarang, Indonesia1,2

Abstract. Knowing the status of the village is very important to how developed the village is. The Central Statistics Agency (BPS) has carried out a classification process using the traditional scoring method, making it difficult to provide timely data. In this study, decision tree algorithm will be applied. The algorithm will test on the Podes2016 dataset focused on the Daerah Istimewa Yogyakarta (DIY) region, where the accuracy matrix is used to measure the algorithm's performance. The results showed that the proposed algorithm highest accuracy (87.40%) than the two comparison algorithms, such as the ID3 (83.81%) and C4.5 (80.62%). It can be concluded that the proposed algorithm can score very well and has good accuracy.

Keywords: Village status classification; podes2016; tree algorithm

1 Introduction

Indonesia is one of the largest archipelagic countries in the world. Administratively, the territory of Indonesia is divided into several regional levels, namely provinces, districts/cities, sub-districts, and urban villages, which are the smallest administrative areas (BPS, 2010). In addition, Indonesia is also famous for its natural resources, but these have not been optimally utilized to create a more prosperous life for the people. Inequality of development is still one of the problems faced. To overcome this, the government has drawn up a development plan contained in the Nawacita. One of the points is to build Indonesia from the periphery by strengthening regions and urban villages within the framework of a unitary state. The development carried out applies a decentralized system, namely development that spreads to all corners of Indonesia. To realize equitable development planning, it is necessary to have a link between the urban village and the city. This, in line with Tarigan's (2003) research, through the agropolitan concept, emphasizes that they can achieve village development well if the village is linked to urban development in the region. The existence of village funds is a tangible form of supporting development in village areas, especially to increase access to connectivity.

The village development program based on invite law no. 6 of 2014 aims to develop villages with more advanced life, both social, economic, and environmental resilience. This program went well enough to give birth to several village areas that changed their status to developed villages. This causes a shift in determining the characteristics of rural and urban status. Therefore, there is a need for uniformity in the use of concepts, definitions, and criteria for urban and rural areas in Indonesia.

The current classification of urban villages still refers to the Kemendes publication in 2016. Until to 2022, Kemendes has not provided the latest data regarding village data updates in Daeras Istimewa Yogyakarta in Indonesia where the status of villages may have changed.
Currently, many villages are undergoing changes in an advanced direction such as building public facilities, strengthening the economy, and others. Each village has different social, economic, condition and access characteristics which will continue to change over time. These criteria are used by Kemendes as an indicator to classify areas into rural or urban classifications. According to Tarigan (2003), regional development planning includes various aspects that take into account the interrelated roles of villages and cities. So that the status of a village is easily known by the government which can be the basis for development planning in rural areas.

Daerah Istimewa Yogyakarta (DIY) is one area that has a major contribution to developing natural and cultural tourism in Indonesia. However, there is still inequality of development in DIY. The Gini Ratio in March 2020 was 0.434, or an increase of 0.006 points compared to September 2019 of 0.428, which made DIY the highest Gini ratio in Indonesia [1]. Based on the above background, this research’s main objective is to algorithm the classification of village status in the DIY region.

Several studies have been conducted for the classification of the rural status. As reported by [2], “Classifying Urban Villages and Rural Villages in Klungkung District Using the Mamdani Method.”. This study aims to classify urban and rural status in Klungkung Regency using the Mamdani method. This study uses secondary data sourced from the Central Bureau of Statistics of Klungkung Regency in 2016. The study results show that the Mamdani method resulted in 52 villages classified as urban villages and seven villages as rural villages with an accuracy rate of 93%. In addition, there are differences in the total score and village status between the results using the Mamdani method and the original data.

Another report is from [3]. They use Classical Quadratic Discriminant Analysis and Robust Quadratic Discriminant Analysis to classify rural status in Semarang Regency in the urban or rural village category. The data used is data collection of Potensi Desa (PODES) DIY Regency in 2011. Their research shows that 183 villages have rural status and 52 urban statuses with an accuracy rate of 87.23%. Meanwhile, the robust quadratic discriminant analysis resulted in a higher accuracy rate of 89.79%, where 167 villages had rural status and 68 had urban status.

This study aimed to compare the scoring algorithm conducted by BPS with the tree algorithm for the classification of rural status in DIY.

2 Methodology

2.1 Dataset

This study uses secondary data from data collection on village potential in the province of the Special Region of Yogyakarta (DIY) conducted by Kemendes in 2016. The data shows that 438 villages spread over five cities and 78 sub-districts, and village status (rural and urban). Table 1 shows the data variables used in this study.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Variables description</th>
<th>Measuring scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Rural status (labels)</td>
<td>Nominal</td>
</tr>
<tr>
<td>X1</td>
<td>Number of shopping group</td>
<td>Ratio</td>
</tr>
<tr>
<td>X2</td>
<td>Number of permanent markets</td>
<td>Ratio</td>
</tr>
</tbody>
</table>
Variables | Variables description | Measuring scale
--- | --- | ---
X3 | Number of junior high schools | Ratio
X4 | Number of senior high school | Ratio
X5 | Distance of the junior high schools to urban village office (kilometers (km)) | Ratio
X6 | Distance of the senior high schools to urban village office (km) | Ratio
X7 | Distance of shopping group to urban village office (km) | Ratio
X8 | Distance of permanent market to urban village office (km) | Ratio
X9 | Percentage of household electricity users | Ratio
X10 | Distance from hospital to the urban village | Ratio

### 2.2 Preprocessing

Data preprocessing is an early data mining technique to convert raw data into cleaner information that can be used for further modeling. The data used has missing values. Missing value often occurs when there is a problem in the collection process, such as an error in data entry. In this study, the data cleaning technique uses basic statistics to fill in the missing value with the mean value.

### 2.3 Algorithms tree based

Tree-based algorithms are regarded as one of the most effective and widely used supervised learning techniques. This algorithm provides high accuracy, stability, and interpretability for predictive algorithms. They can perform classification to map non-linear interactions very well. It is also easy to solve various problems (classification or regression). Notable decision tree algorithms include ID3 (Iterative Dichotomiser 3), C4.5 (successor of ID3), and CART (Classification And Regression Tree).

The ID3 algorithm is a math-based method to create a decision tree that can classify data objects that have classes. ID3 was first introduced by Quinlan (1979) in [4]. The rules generated by ID3 are hierarchical relations such as trees (having roots, vertices, branches, and leaves). Some researchers call the structure of ID3 a decision tree, but other researchers also call it a rule tree [5]. Information gain, commonly called gain info, is a separation criterion that uses entropy measurements.

The C4.5 algorithm is a derived classification model from a decision tree to produce a decision tree developed by Ross Quinlan [6]. C4.5 developed from previous ID3 algorithm. It can use the decision tree generated by C4.5 for classification, so C4.5 is often referred to as a statistical classifier. In 2011, the machine learning software Weka authors described the C4.5 algorithm as "an important decision tree program that is probably the most widely used machine learning workhorse in practice to date" [7].

The Classification and regression trees (CART) is a decision tree-based classification algorithm [8]. This algorithm is quite simple but very powerful. It aims to get an accurate data group as a classification characteristic that can describe the relationship between response variables and predictors. The resulting tree algorithm depends on the scale of the response variable; if the data response variable is continuous, then the resulting tree algorithm is regression trees (regression tree), while if the response variable has a categorical scale, then the resulting tree is classification trees.
2.4 Performance evaluation

In this study the confusion matrix is used as an performance evaluation of the model built. The confusion matrix summarizes the predicted results of the classification problem. The number of correct and incorrect predictions is summed up with calculated values and broken down by each class. The confusion matrix shows how your classification model gets confused when making predictions. It provides insight into the error made by the classifier and, more importantly, the type of error that is being made. Table 2 shows the confusion matrix.

<table>
<thead>
<tr>
<th>Predicted values</th>
<th>Actual values</th>
<th>Positive (P)</th>
<th>Negative (N)</th>
<th>Sensitivity</th>
<th>Precision</th>
<th>Negative Predictive Value</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>True Positive (TP)</td>
<td>False Negative (FN)</td>
<td></td>
<td></td>
<td>(TP / (TP + FN))</td>
<td>(TN / (TN + FP))</td>
<td>(TP + TN + FP + FN)</td>
</tr>
<tr>
<td>Negative</td>
<td></td>
<td>False Positive (FP)</td>
<td>True Negative (TP)</td>
<td>(TP + FN)</td>
<td>(TP + FP)</td>
<td>(TN + FN)</td>
<td>(TP + TN + FP + FN)</td>
</tr>
</tbody>
</table>

F1 Score = \( 2 \frac{\text{Recall} \times \text{Precision}}{\text{Recall} + \text{Precision}} \)

The definition of the term in the picture in Table 2, namely Positive (P) is positive observation; Negative (N) is observations are not positive or negative; True Positive (TP) is the observation is positive, and the prediction result should be positive; False Negative (FN) is positive observation, but negative prediction result; True Negative (TN) is The observation is negative and the prediction result should be negative; and False Positive (FP) is negative observation but positive prediction result.

Accuracy is represents the ratio of true (positive and negative) predictions to the overall data. Precision is the ratio of positive true predictions compared to the overall positive predicted outcome. Recall is the ratio of true positive predictions compared to the total number of true positive data. Specificity is the correctness of predicting negative compared to the overall negative data. F1 score is a weighted comparison of the average precision and recall.

3 Results and discussion

The average value for each group of urban and rural villages is obtained from the data used. It is said to be a rural village if it has a small number of educational facilities and the distance from the village to the school is quite far. Then, having health facilities in a quite far hospital can be traveled an average of 10.1 km, in contrast to urban villages, which only travel an average of 2.62 km to the village office. Furthermore, there are fewer shops and permanent
markets in rural villages for economic facilities, and they are far from the village office. A village with rural status has fewer user households than a village with urban status. Table 3, show

<table>
<thead>
<tr>
<th>Variables</th>
<th>Urban village</th>
<th>Rural village</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>3.32</td>
<td>0.8</td>
</tr>
<tr>
<td>X2</td>
<td>0.64</td>
<td>0.52</td>
</tr>
<tr>
<td>X3</td>
<td>1.71</td>
<td>1.71</td>
</tr>
<tr>
<td>X4</td>
<td>0.97</td>
<td>0.97</td>
</tr>
<tr>
<td>X5</td>
<td>0.28</td>
<td>0.94</td>
</tr>
<tr>
<td>X6</td>
<td>0.9</td>
<td>5.1</td>
</tr>
<tr>
<td>X7</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>X8</td>
<td>1.33</td>
<td>2.57</td>
</tr>
<tr>
<td>X9</td>
<td>40.89</td>
<td>16.61</td>
</tr>
<tr>
<td>X10</td>
<td>2.62</td>
<td>10.1</td>
</tr>
</tbody>
</table>

The experiments are conducted using a computing platform based on 2.5 GHz Dual-Core Intel Core i5, 8 GB RAM, and macOS Catalina vers.10.15.7 64-bit operating system. The development environment is MS Visual Basic 6, PHP and MySQL as database server.

First of all, from the overall data, we divided two are training (80% totaling 351 villages) and testing (20% totaling 87 villages). The training data aims to build a learning model, while testing aims to test the learning model. Table 4 shows the results of the classification using the CART algorithm, and Table 5 show the confusion matrix CART algorithm.

<table>
<thead>
<tr>
<th>Performance Values</th>
<th>Training</th>
<th>Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.874</td>
<td>0.908</td>
</tr>
<tr>
<td>Specificity</td>
<td>0.805</td>
<td>0.62</td>
</tr>
<tr>
<td>Precision</td>
<td>0.7801</td>
<td>0.6334</td>
</tr>
<tr>
<td>Recall</td>
<td>0.865</td>
<td>0.4153</td>
</tr>
<tr>
<td>F1-score</td>
<td>0.8662</td>
<td>0.8323</td>
</tr>
</tbody>
</table>

Table 3. The results of the average value of each variable.

Table 4. Performance results of all the data using only CART algorithm.

<table>
<thead>
<tr>
<th>Actual</th>
<th>Predicted</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban village</td>
<td>168</td>
<td>24</td>
</tr>
<tr>
<td>Rural village</td>
<td>22</td>
<td>224</td>
</tr>
<tr>
<td>Total</td>
<td>190</td>
<td>248</td>
</tr>
</tbody>
</table>

As you can see in Table 5, which shows the results of overall data classification, there are 392 villages classified correctly according to the actual status. It can be interpreted that the CART's accuracy to the overall data is 89.50%. Then, the other validation measures are calculated.

Secondly, we compare CART with ID3 and C4.5 to determine which algorithm performs better. In a more detailed comparison, we present the comparisons in Table 6. The bold type
indicates the best value for each evaluation. As shown in Table 6, the first experiment (CART) outperformed the two comparison algorithms. Meanwhile, in the second experiment, the ID3 outperformed C4.5.

Table 6. Result of the comparison accuracy of three tree-based algorithms.

<table>
<thead>
<tr>
<th>Algorithms</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID3</td>
<td>83.81%</td>
</tr>
<tr>
<td>C4.5</td>
<td>80.62%</td>
</tr>
<tr>
<td>CART</td>
<td>87.40%</td>
</tr>
</tbody>
</table>

In the last experiment, we compared the visualization of urban and rural village characteristics by classification results BPS and our work.

As shown in Figure 1, the results of the classification carried out by BPS are 190 urban villages spread over each district, such as 16 villages in Kulon Progo Regency, 54 villages in Bantul Regency, 8 villages in Gunungkidul Regency, 68 villages in Sleman Regency and 44 villages in the city of Yogyakarta. Meanwhile, 248 are classified as rural villages spread over five regencies. These include 72 villages in Kulon Progo Regency, 21 villages in Bantul Regency, 136 villages in Gunungkidul Regency, 18 villages in Sleman Regency, and only one village in Yogyakarta City.

In contrast to the proposed algorithm, the results show that 192 urban villages and 246 rural villages are spread across each district. For urban villages, there are 16 villages in Kulon Progo Regency, 50 villages in Bantul Regency, 17 villages in Gunungkidul Regency, 66 villages in Sleman Regency, and 43 urban villages in Yogyakarta City. As for rural villages are 72 villages in Kulon Progo Regency, 25 villages in Bantul Regency, 127 villages in Gunungkidul Regency, 20 villages in Sleman Regency, and only two villages in Yogyakarta City.
4 Conclusion

Based on the results of this study, there is a significant difference between the modeling carried out by BPS with the proposed tree-based capitalization results. From the performance approach, the proposed algorithm is better than BPS. Furthermore, the proposed algorithm is also compared with ID3 and C4.5, and the result is that the proposed algorithm is superior to the two previous algorithms.

Future research will be concerned with benchmarking the proposed method with other clustering techniques, such as DBSCAN, Fuzzy Cmeans, etc. and other meta-learning techniques, such as bagging and boosting also challenging to be studied in our future work.

Acknowledgments. We would like to express our gratitude to Computing Intelligent System Research Group (CISRG) for warm discussion about this research.

References

Strengthening Digital Literacy Through Scientific Literacy For Indonesian Emas 2045 In Elementary School

Suci Perwita Sari¹, Sarah Fazilla², Sri Milfayetty³
{suciperwita@umsu.ac.id}

Study Program of Primary Teacher Education Universitas Muhammadiyah Sumatera Utara¹, Study Program of Primary Teacher Education IAIN Lhokseumawe², Postgraduate Program University of Medan University of Medan³

Abstract. The biggest obstacle in improving education is synchronize the grand design and the blueprint for education. The goal of national education does not run well without guidance. In realizing Indonesia Emas 2045, the development of technology and knowledge a must for creating creative industrial society. This study is a systematic review study for analyzing the influence of scientific literacy and digital literacy for Indonesia Emas 2045. The article searches through the Google Scholar database. It found 4590 journal articles. After inclusion and exclusion done, 12 journals obtained for systematic review. The results found that there is relationship between digital literacy and scientific literacy for Indonesia Emas 2045. The conclusion is the increase of digital literacy, born new learning methods and media that improve scientific literacy. By increasing scientific literacy, learners' creative thinking skills also increase so ability in one of Indonesia Emas 2045 achieved, the creative entrepreneurs.

Keywords: Digital Literacy, Scientific Literacy, Indonesia Emas 2045

1 Introduction

The states goals are the motivation for a country to develop and innovate. This goal will become a reference for a country to make various improvements in various main sectors of the country, such health, education, economy and social culture. Indonesia's goals and dreams for 2085 are sovereign, advanced, just and prosperous. To achieve this, a medium-term plan is needed. The medium-term plan that was launched was Indonesia Emas. In order to prepare for the rise of the golden generation in 2045, it is necessary to develop education in the future perspective, namely, to create a quality, advanced, independent, and modern Indonesian society and to increase the dignity of the nation. Success in building education will make a major contribution to the achievement of overall national development goals[11].

The achievement of Indonesia Emas be realized by various efforts, such increasing student literacy. However, based on data obtained from PISA data, the scientific literacy of Indonesian students is still less when compared to the international average score. This result supported by TIMSS (Trends in International Mathematical Science Study) which is coordinated by the Association for the Evaluation of Education Achievement (IEA) that Indonesia ranks 40 by 42 countries value of 402 students. To improve scientific literacy, various studies for scientific literacy of students at Elementary School. One of the studies that correlate is digital literacy.
In Covid 19, everyone is required to be able to understand digital literacy either by self-taught or the learning process. Digital literacy is needed so that people have a critical attitude in responding to any information and interactions that exist. Thus, it can be initiated that there is a link between scientific literacy and digital literacy in achieving Indonesia Emas 2045.

**Understanding Of Scientific Literacy**

PISA (Program for International Students Assessment) is a program initiated by the OECD which aims to evaluate the education system participated by more than 70 countries. Indonesia is one of participated in the PISA in 2008. One of the programs compiled by PISA is scientific literacy. Scientific literacy in board terms and argued that an open-ended approach, free of benchmarks and high-takes testing, allows teacher and students more freedom to choose form a wide variety of science content and methodologies.

This statement means that scientific literacy is an approach which is open, free from benchmarks and has high testing, allowing teachers and students to have more freedom to choose a variety of scientific content[5]. Scientific literacy is an element of life skills that must be the key outcome of the Education process up to the age of 15 years old. Therefore, students aged 15 years (towards the end of compulsory education) are deemed necessary to have an adequate level of scientific literacy, both for those who will continue their studies in the field of science or those who are not[11].

The importance of scientific literacy is to realize science-literate society, science learning also trains learner to mates and solve the problem using higher order thinking skill. It not only understanding the concepts, but also know how to apply the relevance of science learning in daily life and social problem[11].

**Understanding Of Literacy Digital**

The concept of literacy was born about 3000 years ago, when the ability of persuasive rhetoric played an important role in communication. In the Guttenberg printing era, literacy was redefined as the ability to read and write. Therefore, the invention of portable cameras made it easy to produce and distribute images which later introduced consoles for visual literacy. According to Mohammadyari and Singh[23], digital literacy is the ability to use digital devices and equipment to search, evaluate, use and create information.

Furthermore, Tang and Chaw [5] stated that digital literacy is a prerequisite skill that must be possessed learn effectively in distance learning. Hague and Payton [13] argue that digital literacy is ability to apply functional skills on digital devices to find and select information, think critically, be creative, collaborate with others, communicate effectively, electronic security responsive and socio-cultural context.

Based on the various definitions and explanations above, digital literacy is the interest, attitude and ability of individuals to use digital technology and communication tools such as smartphones, tablets, laptops and desktop PCs to access, manage, integrate, analyze, evaluate information, build new knowledge, create and communicate with others in order to participate effectively in society. And with digital literacy, it can make it easier for educators to plan and prepare teaching materials so that the learning process is more active and creative.

There are five digital literacy competencies by Hobbs[15]:

a. Access, the competence to search using media and technology and share appropriate and relevant information with others.

b. Analyze & evaluate, understanding the message through critical thinking to analyze the quality of the message, honesty, credibility, and point of view, then consider the potential effects or consequences of the message.
c. Create (content creation), the process of producing content using creativity and self-confidence to express oneself, supported by awareness of purpose, readership, and compositional techniques

d. Reflect, applying social responsibility and ethical principles of own identity and life experience in their communication behavior.

e. Act, is the process of working individually and collectively to share knowledge and solve problems in the family, workplace and community, and participate as members of society at local, regional, national and international levels.

Integration of Literacy with Indonesia Emas 2045 Program

Indonesia's sustainable development in achieving Indonesia Emas 2045 is based on the Document Sustainable Development Goals (SDGs) with one of the focus goals in improving the quality of education. The agreement implementation Peraturan Presiden No. 59 of 2017 about the Achieving Sustainable Development Goals, managed global goal of Education, to ensure the quality of inclusive and equitable education and to increase lifelong learning opportunities. Obtained quality education, great progress has been made. one of basic literacy skills in literacy.

Various programs held to improve public literacy. In the aspect of digital literacy, the government has held a digital literacy webinar program to provide an understanding in social media. In elementary schools, online final exam socialized to students in Indonesia. In scientific literacy, implementing scientific literacy-based questions in various test questions. Both semester exams, national exams to CPNS exams. This program due to all citizens have well literate from an early age so that they are able to think critically in solving various problems that arise.

Based on all over statements, the relation of literacy and achievement of Indonesia Emas is by literacy, expected has skills in science and technology. Thus, the hope of Indonesia's golden generation is achieved: religious, intelligent, productive and comprehensive.

2 Research Methods

The method used is a systematic review based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The search focuses Scientific Literacy, Digital Literacy in Elementary School journal in achieving Indonesia Emas 2045 published in 2021. The literature searched on 1 – 4 November 2021 through Google Scholar database. The keywords used "Digital Literacy in Primary School, Scientific and Digital Literacy in Elementary School, Integration Literacy and Indonesia Emas 2045", Journal articles filtered by title and abstract, then selected based on criteria, Scientific Literacy, Digital Literacy in Elementary School and relevance to Indonesia Emas 2045 Program. Irrelevant journals will be ejected, then evaluated based on inclusion criteria:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusion</td>
<td>English, Indonesia, Keyword Accordance, Qualitative and Quantitative</td>
</tr>
<tr>
<td>Eksklusi</td>
<td>Teaching Tools, Learning Method</td>
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</table>
The literature searched that 8199 journal articles based on the variables of digital literacy, scientific literacy and relationship to Indonesia Emas 2045. Then matched criteria literature obtained for a systematic review.

Fig 1. Roadmap Literature Research

3 Result and Discussion

Based on the research search results, obtained 11 quantitative and qualitative research with descriptive and comparative designs. The findings of articles that match presented in the form of a table below by including the title, author, year of publication, research location, research objectives, research methods, research samples, and research results.

Table 2. Results of Systematic Review

<table>
<thead>
<tr>
<th>No</th>
<th>Title (Author, Years)</th>
<th>Country</th>
<th>Purpose</th>
<th>Research Design</th>
<th>Sample</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Current Status and Development of Digital Literacy Education in Elementary Schools (Yang, Ji-Hye, Hyun, Yong-Chan, Park, Jung-Hwan, 2021)</td>
<td>South Korea</td>
<td>Describe the function of digital literacy in learning process in elementary schools</td>
<td>Qualitative, Survey</td>
<td>Principal, 4 Elementary School Teachers, 775 Students, and Parents</td>
<td>The survey results of 775 students found that the use of digital media in learning not maximized. Internet access in finding teaching materials should be expanded. Distance education in the spring can be held teachers anytime and anywhere using the right technology. Digital literacy education in primary schools through software education, not through education needs a learning policy for digital media literacy education, such wireless internet available in classrooms, and 1 student used 1 laptop or 1 Smart Pad device</td>
</tr>
<tr>
<td>2</td>
<td>Towards an inclusive digital literacy: An experimental intervention study in a rural area of Brazil (Viviane Brito Nogueira, et al,)</td>
<td>Brazil</td>
<td>Investigate the impact of logic and mathematics through digital literacy in Elementary School students</td>
<td>Quantitative, Experiment</td>
<td>5th grade students for 1 semester</td>
<td>The students have interest in the class. Although some of the students unfamiliar with computer, but the progress was amazing. Digital literacy competence and technology skill increased in all semester. Students enhance the interaction with computers (eg touchpad and typing skills) and confidence in digital environments. Student scores on the</td>
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</table>
logic/mathematics assessment showed a significant increase. This was not observed in the control group, indicating the importance of this type of intervention even with one provided by a 16-hour course.

<table>
<thead>
<tr>
<th>3</th>
<th>Digital Literacy Curriculum in Elementary School (Rizal Kailani, Rudi Susilana, rusman, 2021)</th>
<th>Indonesia</th>
<th>Find out the category of digital literacy in elementary schools</th>
<th>Literature Review</th>
<th>15 digital literacy article and 10 digital literacy articles</th>
<th>The digital literacy curriculum integrating to digital literacy in all school areas. In the learning implementation, elementary school students consider the teacher as the only source of information. Therefore, it is necessary to collaborate teachers, principals and parents in digital literacy learning. Digital Literacy in Elementary Schools takes more emphasis on Media Literacy in learning that impact on interactive and collaborative learning, such video, stop-motion and social media. Digital Literacy can improve student learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Status of Digital Literacy among Elementary and Secondary Students in Punjab Farkhunda Rasheed Choudhary, Tariq Javed, Muhammad Hamid Nawaz Khan, 2021)</td>
<td>Pakistan</td>
<td>To describe the digital literacy skills of elementary and middle school students</td>
<td>Quantitative Survey</td>
<td>200 students: 99 females dan 101 males</td>
<td>It found that students have a weakness in digital literacy skills. The students’ understanding of computer was less. The reason of the less computer skills is the unavailability of computers and laptops in students’ homes. It is suggested to make computers mandatory for the middle class as well so that students can handle computer gadgets and can equip themselves with digital literacy skills.</td>
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<tr>
<td>5</td>
<td>Developing Digital Literacy Based on Educational Games to Increase The Interest of Reading (Dina Salsabella Utami1, Agustina Tyas, Asri Hardini2, 2021)</td>
<td>Indonesia</td>
<td>Describe the reading habituation activities by innovating digital media.</td>
<td>Research and Development, Qualitative and descriptive method.</td>
<td>2nd Grade Elementary School</td>
<td>The results indicate the development with a percentage of 100% and media with results of 84.2%, so both are classified as &quot;Very high&quot; with an interval of 81% to 100%, but the material still needs to be improved. The learning media developed by this researcher can be solution to overcome the low interest in reading for students, in this developed media the researcher makes students not only play and have fun, but also there is some knowledge that will be gained from the process of completing educational games, students can also play and learn at the same time as other students. With this, the availability and use of learning media is not adequate and the media cannot be utilized optimally by teachers because teachers are still focused on books that are only available.</td>
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<tr>
<td>6</td>
<td>Digital Literacy As A Solution To Improve The Quality Of Indonesia’s Human Resources (Danang Dwi Harmoko, 2021)</td>
<td>Indonesia</td>
<td>Qualitative, Descriptive Electric and Print Media</td>
<td>The research result stated that digital literacy education is very important to improve the quality of Indonesian human resources. Individuals' digital literacy characteristic are: 1) the ability to maximize digital potential, 2) digital resilience, 3) be positive and productive individuals, and 4) become part of the world community.</td>
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<td>7</td>
<td>Citizenship Literacy of Primary Schools: An Effort For Indonesia's Future Challenges (M Wahono, Dianasari, Y Hidayah, 2021)</td>
<td>Indonesia</td>
<td>Qualitative Elementary School Students</td>
<td>The results showed that civic literacy for elementary schools using civic websites that were adapted to meet learning needs at the elementary school level. The understanding of civic literacy for elementary schools’ accordance to Citizenship Education characteristic in the Indonesian context. In addition, the cooperation and efforts of various groups including families, government, communities, and schools are needed to achieve successful civic literacy for elementary schools in the future.</td>
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<td>8</td>
<td>Scientific Literacy: The Conceptual Framework Prevailing Over The First Decade of The Twenty First Century (Costa, Antonio Manuel, et al, 2020)</td>
<td>Columbia</td>
<td>Systematic review of the literature 250 literatures</td>
<td>The results suggest that scientific literacy embodies a construct that is deictic in nature, shaped by the social, political, cultural and scientific contexts prevailing int the society belongs to.</td>
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<tr>
<td>9</td>
<td>English Learners’ Science-Literacy Practice Through Explicit Writing Instruction in Invention Based Learning (Kim, So lim and Kim, Deksoon, 2021)</td>
<td>United State</td>
<td>Qualitative 3 English Learner s</td>
<td>Students’ language skills and conceptual learning developed. In addition, students perceived writing as an essential sill for learning science.</td>
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<tr>
<td>10</td>
<td>Gadget Based Interactive Multimedia on Socio-Scientific Issue to Improve Elementary Students’ Scientific Literacy (Suryanti, et. All (2021))</td>
<td>Indonesia</td>
<td>Quantitative 25 suburban student s</td>
<td>GBIM is compatible as alternative learning media to improve elementary students’ scientific literacy.</td>
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</table>
Preparing Indonesian Gold Generation 2045 Through Quality Education

There are seven things in achieving Indonesia Emas, increasing the education budget, education management, make free schools from the business atmosphere, improving the curriculum, religious education, education training critical awareness, empowering teachers.

Table 3. Description scientific literacy and digital literacy in Indonesia Emas 2045

<table>
<thead>
<tr>
<th>Description scientific literacy and digital literacy in Indonesia Emas 2045</th>
<th>Journal Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital literacy is very important to improve the quality of Indonesian human resources</td>
<td>Digital Literacy As A Solution To Improve The Quality Of Indonesia’s Human Resources (Danang Dwi Harmoko, 2021)</td>
</tr>
<tr>
<td>Digital literacy plays an important role in improving the quality of education in Elementary School level</td>
<td>Current Status and Development Direction of Digital Literacy Education in Elementary Schools (Yang, Ji-Hye, Hyun, Yong-Chan, Park, Jung-Hwan, 2021) Digital Literacy Curriculum in Elementary School (Rizal Kailani, Rudi Susilana, Rusman, 2021) Citizenship Literacy of Primary Schools: An Effort For Indonesia’s Future Challenges (M Wahono, Dianasari, Y Hidayah, 2021)</td>
</tr>
</tbody>
</table>

Based on the results of a systematic review from table 2, it is known that literacy, especially digital literacy, has an important role in improving the quality of human resources. Danang Dwi H[6] stated that digital literacy education is very important to improve the quality of Indonesian human resources, expected characteristics, the ability to maximize digital potential, digital resilience, become positive and productive individuals, and being able to become part of the world community.
In addition, in basic education digital literacy also has an important role in improving the quality of learning to make it more interesting and able to increase children's interest in learning. In his research, Yang Ji-Hye, Hyun, Yong-Chan, Park, Jung-Hwan [10] suggested that digital literacy is important to be applied in elementary school because improve children's logical thinking competence and it requires the support of a good education system to be optimal.

It supported with M Wahono and Dianasari[13] that the application of civic literacy for elementary schools can be done by using civic websites that are adapted to meet learning needs at the elementary school level, the implementation requires good cooperation with various parties, namely family, government, communities, and schools of the future.

The results of the systematic review in table 2 also found 2 journals related to the importance of scientific literacy in life skills in the 21st century. The results suggest that scientific literacy embodies a construct that is deictic in nature, shaped by the social, political, cultural and scientific contexts prevailing in the society belongs to[3]. Kim, So lim and Kim, Deksoon[19] stated in learning English, students language skills and conceptual learning developed.

Students perceived writing as an essential for learning science. Furthermore, from table 2 there are also 4 of 11 journal articles which state that mastery of technology through digital literacy in educators has an influence on the readiness of learning administration that supports increasing scientific literacy. Suryanti[20] suggests that Gadget Based Interactive Multimedia is compatible as an alternative learning media to improve elementary students' scientific literacy. Viviane Brito N[26] stated that the use of digital literacy increases in learning and the presence of digital literacy competence has an effect on the behavior of using technology which increases significantly.

Based on the study results of 11 relevant journals, it can be seen that literacy is an important component in building the quality of human resources through the Indonesia Emas program in 2045, especially digital literacy and scientific literacy. In implementation, support from various parties is needed, especially a good education system and also the understanding in teaching materials at the basic education level.

Teachers expected to improve their skills, especially pedagogical and professional skills. Regina ade Darman[17] stated that there are seven things in achieving the Golden Indonesia, such increasing the education budget, education management management, make free schools from a business atmosphere, curriculum improvement, religious education, education training critical awareness, empowering teachers.

Based on the results of a systematic review research that literacy, namely digital literacy and scientific literacy, has an important role in improving the quality of human resources through the Indonesia Emas program in 2045. To be able to make this program a success, it requires the support of various parties, especially teachers as the nation's generation printers. innovative by integrating technology and pedagogical capabilities it has so that later it is able to produce outputs, namely superior human resources and are able to compete with the international community.
References


Abstract. The existence of the ability and competitiveness in taking the moral decisions by applying this higher order thinking is any resilience to achieve the moral success. Every individual need the higher order moral thinking capability and competitiveness, that is why, it needs development efforts on the appropriate time. This hereby achievement was seldom founded in Indonesian societies, especially to adolescents. Usually, adolescent decide moral problems with obey attitude upon the moral thinking happened in society and his nearest milieu, without analyzing later by applying the higher order moral thinking. This article was arranged starting from the importance of the higher order moral thinking to adolescents who oriented in strong self-interdependence. The discussions were directed at fostering the higher order moral thinking toward adolescent students through guidance the form of content mastery services in the school.

Key words: HOMTS, adolescents, Interdependence, Content Mastery, School

1 Introduction
The digitalization era facilitates human life and on the other sides, it requires individual to be able to face the complicated challenges and the including bad impact. Facing this challenge, every individual has to prepare himself with the resilience personality, skill, and knowledge. In education world especially to adolescent aged student, namely who are learning in junior and senior high school, needs to be facilitated his self-preparation to be able to make decisions or act by using the higher order intellectual and moral thinking. In accordance with human essence as thinking creatures and moral thinking creatures, this HOTS and HOMTS are an accurate strategy to avoid adolescent aged student taking decisions and doing mistake because of using LOTS and LOMTS. In LOMTS for example, student decides smoking in order to be considered as good person and conform in the group.

HOMTS should have been achieved on the early puberty development period, namely at the age of about 12 years old. The hereby achievement was seldom founded its indicators on adolescents in Indonesia. The writer’s observation results informally indicated that generally students on the adolescence age indicated the moral thinking characteristic was on low or middle level, not reaching the higher level. This middle order thinking capacity was indicated from the main characteristic of conventional level moral thinking, namely strike to find consideration/evaluation from outside as nice person, person who places on himself to be part of group.

From eleven studies (11) about the adolescent moral thinking achievement in some sites in Indonesia done from 1982 up to 2019 showed that adolescents moral were generally on the conventional level, phase 3 and phase 4. For instance, the research of Menanti (2008) expose factors about factors affecting the Malay adolescents moral thinking in more culture milieu at 29 Senior High Schools in Deli Serdang District, North Sumatra, Indonesia, with sample total 147 persons, founded that 35,34% students were on the moral thinking phase 2, 3, and 4 and one of factors affecting this moral thinking achievement was self-interdependence construal, with impact as big
as 9.26%. Although this affection was not too big, but it significantly influenced with test result thitung = 2.2566. T hitung > t kritis, on the significance degree of 95%. Ho was rejected, Ha was accepted, it meant there was significantly impact of self-interdependence construal toward their moral thinking.

The condition of adolescent moral thinking achievement generally at the conventional level invites to discuss how the adolescent aged student moral thinking potence in school can rise and develop in order to achieve HOMTS. In this paper writer chase kind of content services which its service apply information giving and next on providing training about HOMTS oriented on self-interdependence values to adolescent student in school.

This theory view used the development psychology reference, namely human thinking level theory proposed by Jean Piaget, the theory of moral thinking stage proposed by Lawrence Kohlberg, Self-interdependence- independence construal approaches proposed by Markus and Kitayama, cognition level proposed by Benyamin Samuel Bloom with M.D. Engelhart, E.J. Frust, W.H. Hill, and D.R. Kratwohl year 1956, then revised by Lorin W. Anderson and David R. Kratwohl in 2001.

On this part, discussions were systematically elaborated as: 1. Adolescent student in school, 2. Thinking ability and adolescent moral thinking, 3. The moral thinking in related to HOMTS, 4. The moral thinking in related to self-interdependence construal, 5. Self-interdependence construal in Indonesia, and 6. Strike for the appearance of students’ HOMTS in school through content mastery service.

**Adolescent student in school**

Adolescent means growing old, including physical growth, thinking ability, moral thinking, social and emotional development. The concept ‘adolescent’ was focused on individual with age more or less from 11/12 to 18/19 years old, in detail could be explained that early adolescent more or less from 11/12 to 13/14 years old, middle adolescent, from 14/15 to 16/17 years old, and post-adolescent, from 18/19 to 20/21 years old (clearer look at Hurlock, 1973). Point of departure from this range age, adolescent who studied in junior high school and senior high school.

In school management in Indonesia, the students in SMA and SMP obtained administration service, learning service, and guidance and counseling services. The administration service is provided by principal as well as staff, learning service is provided by subject teacher, and guidance and counseling service is provided by guidance and counseling teacher or school counselor. The guidance and counseling service is prepared in variety of activities such as services of mastery content, group guidance, counselling.

**Thinking ability and Adolescents’ moral thinking ability**

**Adolescents’ thinking ability**

Jean Piaget proposed that human thinking level was differentiated on sensory period (0-2 year), pre-operational period (2-7 years), Concrete operational period (7-11 years) and formal operation period (12-15 years). Look at this age range of thinking ability periodization, hereby adolescents age have reached formal-operation thinking period, a long having enough intellectual, because intellectual quotient based on the attainment of thinking ability development (Monk, F.J.A.M.P. Knoers, S.R. Haditono, 2002).

On sensory period (0-2 years), children mental activity is to shape mental image of an object or event and to use those images to reconstruct objects and events. The mental activity is begun from spontaneity and reflex such as sucking finger. From sensory activity, it develops to be habituation and then will develop an intellectual ability starting from simplest insight. At pre-operational period (2-7 years), child still used concrete physical operations. This main characteristic of pre-operational period is symbolic functions development, so child can make object images in his environment, for instance, stick is considered as gun.

The child thinking ability is limited on intellectual ability centered just to one dimension of an event or an object, like thought that car is big. At the thinking ability of pre-operational level, child is still difficult to remove other’s view. On operational concrete period (7-11 year), child is able to think more than one dimension, for instance thinking that car is big and weight. Child is also starting
to be able to use mental images to solve problem, not only using concrete object like on pre-operational period (2-7 years). Child have decentration ability and conservation, such as child looks at two big glasses where its shape and liquid are similar. When one of the glasses is moved to glass with higher and slimmer shape, child at pre-operational period (2-7 years) told that content of glass with higher and slimmer shape is more.

In turn, child at operational concrete period (7-11 years) told that content of both glasses is similar. Child can understand conservation problem because child can operate the turned around mental operation (an example at, above glass content) and child understands equivalent logical principle such as $A = B$ and $B = C$, so $A = C$. On formal-operation period (12-15) years), adolescent reaches peak of thinking ability development. For next development, it occurs thinking pattern refining, application, extension. This formal-operation period feature, individual can thinks abstract, logic, able to make hypothesis, systematic, and often using this thinking features in taking decision.

According to Piaget (in Ginsburg and Opper, 1979), in the thinking ability development, individual was proactive to use scheme, assimilation, accommodation, organization, and equilibration. Scheme is cognitive system placed by individual to share experience meaning. Scheme is the mental framework to organize information in order to happen new insight/knowledge. Assimilation is processed to include new information (experience) into scheme in self-individual, in turn accommodation is a process where individual adjusting a scheme that have been inner self toward the entrance of new information. The accommodation and assimilation process are going on in order to occur science and knowledge addition. In the meantime, equilibration is continuously drive toward knowledge achieving balance.

**Adolescents' Moral Thinking Ability**

There are four approaches dominating morality area. One of them was cognitive development theory (Sunar in Lorner and et all, 1980). The cognitive development theory primarily concerns on moral thinking (Menanti, 2008). Moral thinking becomes choice because every human’s decision and behavior need reasoning. The most famous figure is Lawrence Kohlberg. He proposed theory on moral at cognitive domain, not discussing moral behavior. The moral theory proposed by Kohlberg was named with different term but same purpose, namely moral judgement, moral reasoning, moral thinking (Setiono, 1979; Menanti, 2008)

Lickona (1976) proposed that according to Kohlberg (1971a, p. 152), the concept of morality was a philosophy than morality as behavior concept. The moral structure essence was fairness and core of fairness was obligation and right distribution regulated by the concept on right equalization and reciprocal relationship. Justice is not a rule or a set of rules; it is a moral principle. By a moral principle we mean a mode of choosing which is universal, a rule of choosing which we want all people to adopt always in all situations (Lickona, 1976). This moral principle was reference in determining individuals’ moral thinking achievement and that a moral principle is not a rule of action but a reason for action. Kohlberg (1970, in Lickona, 1976) proposed that there wase exception to rules, then but no exception to principles.

Kohlberg proposed about three levels of human moral thinking. Each level consisted of two stages so there were six human thinking stages (Arbuthnot and Faust, 1981; 1996; Smetana and Turiel in Adams and Berzonsky, 2001; Steinberg, 2002; Reimer, Paolitto, and Hers, 1983; Kohlberg in Lickona, 1976; Velasque, 2003; Eckensberger and Zimba in Berry, Dasen, Saraswati, 2001; Menanti, 2008). These six phases of moral thingking were revised to be five phases by Kohlberg, because individual very seldom was founded to reach phase 6.

The highest moral thinking level is post-conventional, the lowest one is pre-conventional level and the middle one is conventional level. The pre-conventional level moral thinking consisted of phase 1, Heteronomous morality and phase 2, Morality for exchanges and instrumental purpose; conventional level consists of phase 3: Collaborative interpersonal expectation morality, relationships and interpersonal humankind, and phase 4: Morality for a social system; post
conventional level consists of phase 5: Social contract morality or individual right benefit, and phase 6: Morality for general ethical principle. The first phase moral thinking orients to authority owner like to parent morality. The moral thinking phase 2 orients to the favorable and mutual advantage reciprocal relationship. For instance, a child squeezes his mother body and for this, he asks his mother responding him by giving a cake. The moral thinking at phase 3, refers to moral thinking to be told as a good person. Phase 4 refers to strike to fulfill the occurring rules in society. On the moral thinking phase 5, individual assumed that right one is one that emphasizes public interest, although experiencing conflict with the existing rules. The moral thinking phase 6, individual strikes upholding the universal morality, such as upholding the human right, freedom to talk, fairness. On this phase, it is consistent, logic, and comprehensive moral principles.

Moral Thinking Ability Related to HOMTS

HOTS inspired writer to think about HOMTS, namely HOTS in deciding right or wrong, good or bad, reasonable or unreasonable, proper or improper. Based on moral stages characteristic, it is known that moral thinking phase 1 was not shaped in child’ self. Child wholly depends upon authority owner’s moral thinking through knowledge obtained from authority owner socialization. This moral thinking phase 1 showed that child’s moral thinking is still at the remembering/cognitive domain, namely remembering something socialized on himself. Remembering domain is lowest cognitive domain or lowest moral thinking. The moral thinking phase 2 is characterized by simple thought, namely moral thinking is limited on the favorable reciprocal relationship each other between child and others. This child’s moral thinking characteristic at phase 2 is at cognitive domain to understand or interpret in poor system, including cognitive domain or lower moral thinking. About cognitive domain such as remembering, understanding, interpreting, and so on could be looked at Nugroho (2018); Helmawati (2019).

The child/adolescent moral thinking at phase 3 has main features to place on self as good individual. On these three phases moral thinking, adolescents have been able to analyze about the expected moral values and strike to fulfill it, but adolescent moral thinking still depends upon external morality. Moral thinking is cognitive domain of middle order moral thinking. On adolescent moral thinking at phase 4, is starting to rise from orientation fulfilling as good person, toward orienting on fulfilling the moral values requirements to be valid in society at the time. This moral thinking is cognitive domain to analyze, to organize at the middle order.

On adolescent moral thinking at stage 5, adolescent does not only orient to rules conducting in society, but reach including more people interest. They criticize, evaluates moral values involving much more peoples. This moral thinking features are high order cognition domain. At moral thinking stage 6, the internal moral principle has been shaped in self of adolescent and adult. Their moral thinking follows his inner self, owns moral principle obtained from moral values formulation and analysis conducting universally such as upholding values of fairness, and consistent to implement it. This moral characteristic is high order cognition domain.

Moral Thinking Ability in Related to Interdependence Self-Construal

The moral thinking principle at the level of conventional depends upon external values in outer self, primarily to significant others and around community. At stage 3, the external factor is on the evaluation from others that adolescent is considered as good person and at stage 4, is on the evaluation to be considered as obedient person on rules conducting in society.

On the other side, interdependence self-construal contains values stressing on conformity, adapting self, harmonizing (avoiding conflict), sympathizing self and self-involving as well as mutual symbiosis with others. Of moral thinking theory perspective, this interdependence self-construal characteristic is the behavior shapes at level of conventional, namely, to be able to be considered as good person and obedient to rules conducting in society. Similarity between the moral thinking characteristic at conventional stage and interdependence self-construal characteristic is attitude of stressing evaluation on external factor than internal factor. Higher degree of independence self-construal concentration, more orienting on conventional level of moral thinking.
More interdependence individual, more difficulty out of moral thinking level conventional (Menanti, 2008).

**Interdependence Self-construal in Indonesia**

Indonesia is a developing country, with total population about 275 Millions. When classified according to western and eastern societies, then Indonesian communities is included eastern society, Collectivism oriented, and self-interdependence. Triandis et al (1985) (In Berry et al, 1999) used the term of allocentriz for individual living in collectivism culture, and the term of idiocentriz for individual living in individualism culture. Kim et al (1994) picked up Triandis’s opinion about allocentriz and idiocentriz attributes reviewed by Markus and Kitayama (1991), namely individual with allocentriz attribute defined self in group relationships, emotion was focused on others (empathic), needs come from group, attach into group, harmonization emphasized, obedient, the origin similarity, and mutual face saving.

Markus and Kitayama (1991) (In Kelly and Breinlinger, 1996) used term of interdependence for individual encouraging the collectivism cultural values and term of independence for individuals encouraging the individualism cultural values. Individual with collectivism culture considered themselves basically related to others, in the meantime, individual with individualism culture considered themselves as separated individual and independence (Markus and Kitayama (1991a) (In Matsumoto, 2000). According to Hofstede (1980), collectivism society stressed on awareness we, collective identity, emotional dependence, group solidity, sharing, task and group responsibility (Kim in Dore, 1995).

The attitude harmonizing to group was one of collectivism society characteristic (Triandis in Kim et all, 1994). “Fai Ho and Yue Chiu (In Kim et al., 1994) proposed eighteen components of collectivism and individualism, then these components were combined to be five primarily components, such as values, autonomy and conformity, responsibility, competence, and self-confidence and mutual symbiosis. Romero, Stone and Salas in Wood (2003) told that collectivism culture was characterized by values such as “ingroup harmony and personalized relationships (Markus & Kitayama, 1991a, 1991b; Triandis, 1994).

Markus and Kitayama (in Matsumoto, 2000) differentiated individual according to degree of engagement and disengagement on independence and interdependence self-construal. Markus and Kitayama (In Matsumoto, 2000, 2004) proposed idea on self-construal. There are individual who tend to having interdependence self-construal and independence self-construal. The independent construal of self is an insight that consider self as limited entity, separated from significance others such as relative, colleague, close friend.

But interdependence construal of self is an insight that consider self and significance others, unlimited, flexible, and self-realization according to context (Matsumoto, 2000). Matsumoto (2000, 2004) explained that individual with interdependence construal of self-considered self not limited clearly from others. The separation between self and others is clearly not appreciated, but the interdependence among individuals is mostly emphasized.

It is explained that normative tasks keeping the interdependence make individual adapting to be fit and the failure implementing normative tasks causes feeling of guilty, then encouraging individual to harmonize and to adapt into interdependence relationship back. The executed normative norm makes individual to be grown up in culture of adapting, to be a sympathetic person, placing on self in role of we, and acting reasonably. It was done with effort to perform assignments, obligations, social responsibility, and in interpersonal relationships (Menanti, 2008).

In Indonesia, the bounds with others can be looked at concept of mutual cooperation means working together or in togetherness, all peoples’ concept, relative means mutual help, (we) person means avoiding conflict or not competitive attitude, discussion and agreement mean strongly recommending by involving feeling beside rational judgment only, family gathering means interdependence to join, and the ties such as ethnic group, clan, and origin mean interdependence and assisting obligation, even taking responsibility on problem mutually cooperation. This interdependence characteristic is going on general society, family and neighborhood life (like in
time of preparing food at party, applying for couple, making house, visiting relatives). It also goes on the job site, marginal milieu, moreover in more culture milieu.

In positioning self, Indonesian communities were always not separated from social contexts. For instance, someone told, “me and my own clan X”, “me and my relatives”. In more specific context, like: in my home town, I am liked by neighbor”, in my origin association, I am considered older “, in expressing a success, they based on the affecting situational strengths, not based on the internal predispositions. For instance, in expressing a success, tend to say, “I succeed in like this because of family prayer”, someone does not say “I succeed in like this because of my will and hard work”.

In the meantime, individual who oriented independent, the self attributes such as personality, ability, need, motives, objectives, rights, become prominent one in evaluation. Individuals who have independence self-construal own normative tasks maintaining self-independence as separated entity and limited on self. That is why, individual was grown up to be unique, to express self, to actualize self, to have self-esteem on achievement of his internal attributes and to express achievement in public space.

**Effort fostering students’ HOMTS in School through content mastery service**

**Content Service in School**

Content mastery service is one of personal development service (non-academic) available in senior high schools in Indonesia. The other service forms such as information giving, consultation, advocacy, group guidance, and counseling. Content service is an assistance service for students individually or collectively to overcome particularly ability and competence through instruction activities. Lessons learned is one of content unit implied in it such as fact and data, concept, process, law and rules, value, perception, affection, related attitude and action. The content mastery service helps individual overcoming content aspects collaboratively, so through this content mastery service was expected that individual was able to fulfill his need as well as overcoming the experienced problems (Prayitno, 2004; Tohirin, 2015).

What is meant with content mastery service in this paper is effort to foster HOMTS, namely one unit of information giving material and HOMTS training. The objective of this content service is to provide wider knowledge and skill for students to apply HOMTS in taking moral decisions, and finally producing a best moral decision, namely decision that focus on public interest, applying universal values, and being conscience judgment of self.

Specifically, the objectives fostering students’ HOMTS in school are a) to provide comprehension on higher order moral thinking for students, namely moral thinking of broader post-conventional; b) to do prevention so that student is avoided from taking the wrong moral decisions because of lack of ability to apply the higher order moral thinking; c) to solve moral problems faced by students through skill to apply the higher order moral thinking; d) to maintain students’ skill that has already applied the higher order moral thinking.

Fostering HOMTS stresses on principles of student’s activity, openness, voluntarily. By integrating these three principles, it is meant student follows content service voluntarily, has attitude unclosed on needed data, and participates actively to respond other students’ opinion and guidance teacher and counseling/counselor in school). Fostering HOMTS is done in steps started with planning, implementing, evaluating, analyzing evaluation results, follow up, and preparing report.

a. Planning: Determining participants/student, preparing content material in the form of training module and activity administration, including needed facility, arranging content service steps.

b. Implementation: implementing activity by carrying out high touch such as attention, reinforcement, and technology like LCD.

c. Evaluation: Developing instrument, applying, analyzing, and interpreting evaluation result.

d. Follow up: Determining direction of follow up based on evaluation result, communicating and discussing follow up plan, primarily to student as participants.

e. Report: Arranging activities report and communicating to principal, classroom leader and certain subject teacher, student and documenting report.
Fostering HOMTS at Student in School through Content Mastery Service

Fostering HOMTS at student means giving information and developing a training that stimulates the appearance of students’ HOMTS skill. The steps followed as follows:

a. Activity is begun by providing information on background and goal of HOMTS, as well as training steps.

b. To explain students’ assignments and guidance teacher’s role and counseling/counselor, and making commitment

c. To carry out training with assistance of module. Training was done by appearing higher order HOMTS cases and discussing them so appearing moral dilemma that finally achieving students’ HOMTS ability

d. To analyze training result and to carry out process evaluation

e. To communicate to principal, student, classroom leader and certain subject teacher.

In fostering or developing HOMTS, writer referred on mechanism of moral thinking promotion according to moral development theory proposed by Kohlberg. The moral thinking promotion needed role taking (Reimer, Paolitto, and Hers, 1983); Kohlberg (in Lickona, 1976) and Conflict socio-cognitive experiences (Setiono, 1982). According to Arbuthnot and Faust (1981), moral cognitive conflict was needed to increase moral thinking. Appearing higher phase will stimulates moral growth (Kohlberg et al, 1974). This process of moral thinking promotion needs frequency consistence, although moral thinking could probably rise through once turn. The moral thinking was probably occurred through elaboration in moral thoughts at the same stage (Menanti, 1987).

Role taking is an ability understanding other people’s feeling and thought as thought and felt by others. Arbuthnot and Faust (1981) expressed that individual in role taking that there were perspective, wants, expectations, drives, reactions, and other’s different ability. In the meantime, what is meant with socio-cognitive moral conflict is condition of disequilibrium like situation on riddle and curiosity when facing an interesting problem that encourages thought to solve it. According to Turiel (1977), disequilibrium required and a that such resolution came through structural reorganization. It was meant that if problem could be solved by applying higher order moral thinking structure, then moral thinking rises.

Started from mechanism of moral thinking promotion, promotion from LOMST to HOMTS defend upon how to grow the strong role taking and how does role taking stimulate moral cognitive conflict (moral cognitive dilemma), and this moral cognitive dilemma can be solved using higher order moral thinking. Role taking and cognitive moral dilemma were occurred when individual obtains rich opportunity to interact with the other individual whose moral thinking stage higher than his or at least same. To obtain this opportunity, individuals interact with varied and extended persons. Variations can be in age, education, occupation, intellectual. Interaction can also be done without face-to-face relationship, but also through cases, events that attend HOMTS.

2 Result and Discussion

Changing basic values of the interdependence self-construal need long time, because school students in Indonesia live in milieu of individual who orient self-interdependence and collective society. In condition like this, individual is necessary to attend in situation/condition of orienting self-independence to happen HOMTS assimilation and accommodation with selected negative values. Guidance teacher and counseling/school counselor unclosed student’s insight on the importance of self-independence values beside self-interdependence ones and provide guidance on independence and interdependence values placements accurately.

3 Conclusion

Some following conclusions were become recommendation basis of developing students’ HOMTS in School, Indonesia. First, adolescent need HOMTS moreover adolescent who orient to
self-interdependence because orientation values of interdependence self-construal direct individual toward conventional moral thinking. Second, the achievement of HOMTS requires the existence of potentially thinking ability at formal operation stage, namely higher order thinking ability. Third, moral thinking stage development needs a mechanism started by the occurrence of role taking, moral cognitive conflict, and moral cognitive conflict can be solved by individual by applying higher order moral thinking. Fourth, main factor increasing HOMTS is the existence of higher order moral thinking stage that comes from varied individual in age, education, occupation, and life experience.

Students’ HOMTS is increased by creating moral dialog/discussion/ focus group discussion in school, among students and between students and teachers in situation of face-to-face relationship or through social media managed by guidance teacher and counseling/school counselor.

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References


The challenges of Indonesian Middle Education in The Era of Society 5.0 (Case Study in North Sumatera Province)

Agustina Muliati1, Rini Ade Octaviany2, Winda Sihotang3, Isli Iriani Indiah Pane4
{agustinamuliati3@gmail.com}

MTsN 1 Medan, Indonesia1
Universitas Negeri Medan, Medan, Indonesia2,3,4

Abstract. This study aimed to find out the challenges of Indonesian middle education in the society 5.0 era with the subject is the middle school in North Sumatera. The method of this research is literature study with qualitative approach and describe existing phenomena by collecting data from books, journals and scientific works of related and reliable research results. The analysis technique consists of three stages of data reduction, data collection and conclusions. The result statement of this study found that there are still many things that must be prepared by the middle education, then the challenges are done by familiarizing analytical, critical, and creative ways so that Society 5.0 era concepts such as the Internet of things (IoT), Artificial Intelligence (AI), Robotics, and Distributed Ledger Technology (Blockchain) can be applied. So the implication to the Indonesia’s SDG’s in the education’s can be achieved.

Keywords: society 5.0, education, challenges, SDG’s, middle education

1 Introduction

Education has become a trendy topic in Indonesia today. Discussion is about how students graduate from school and how to properly implement the learning process and educate students as the next generation of the nation. Pedagogical problems are also very complex, one of which is the quality of human resources (HR) perceived as less qualified. This lack of perceived quality is the beginning of new problems such as a less than optimal learning planning process.

Based on the Strategic Plan of the Institute of Education Quality of Education In North Sumatra Province 2020 - 2024, revealed that the average index of achievement of the National System of Education (SNP) of junior high school education units in North Sumatra Province in 2019 was in the category "towards level 4" with a range of 5.1 in 2018 and 5.35 in 2019. This value indicates that there is a change taking place.

Although there is an increase in the achievement of 8 quality standards in the education unit, Indonesian education still has many problems that need to be solved and developed. When it comes to targets, it's indeed based on international surveys. At the same time, the Programme for International Student Assessment (PISA) in 2018, published in March 2019, surveyed student ability that placed Indonesian education 72nd out of 77 countries. This data reveals that the power of Indonesian students is still meager.

When talking about the quality of education, Indonesia applies 8 standards that must be improved to achieve quality education, including: (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) assessment standards. These 8 standards will be the guidelines for educational
institutions in improving the quality of Indonesian education, especially in North Sumatra Province, where researchers conduct field observations. Improving the quality of education must also be accompanied by rapid technological and information advancements. In the 21st century, the world has even begun to enter the era of society 5.0.

Society 5.0, one of the terms that promote and describe this digital society, brings this digital reality to life by "suggesting the potential of individual technical relationships to promote quality improvements. "Shake it to some extent. Life of all people through a super-smart society" [1]. So, Society 5.0 has the concept of big data technology (data in large quantities) put together by the Internet of Things (IoT) and changed by Artificial Intelligence (AI) and robotics so as to improve people's quality of life so that life becomes better. Society 5.0 impacts every aspect of life, from health, urban planning, transportation, agriculture, industry, and education. Quality education is defined as education that produces products that meet current needs [2]. Therefore, the development of education is not limited to trying to complete what already exists and improve what has been achieved, but also not limited to finding opportunities (improvement by people), but more importantly, trying to produce something different based on the times.

Society 5.0 targets an era where the focus of society is on humans who balance economic progress by integrating the virtual world and the real world through systems so as to solve social problems. This idea was born in response to the Industrial Revolution 4.0 as an important technological development change, but society plays a very important role in being able to achieve the era of society 5.0. The concepts of Industrial Revolution 4.0 and Society 5.0 are actually said to be pretty much the same. The difference is that Industrial Revolution 4.0 uses artificial intelligence, and Society 5.0 focuses on the human element. The concept of "Society 5.0" is a new innovation from "Society 1.0" to "Society 4.0" in the history of human civilization.

The Concept of Society 5.0 was created to support the 17 Sustainable Development Goals (SDGs) of the United Nations by 2030. To achieve these 17 goals, people must be able to take advantage of the sophistication of the digital world to change their lives and find environmental and social solutions to the problems around them. One of the goals of the 17 Sustainable Development Goals (SDGs) on education is to ensure inclusive and equal quality education, as well as support lifelong learning opportunities for all.

Based on field surveys conducted by researchers, the educational problems that occur in junior high schools in North Sumatra Province indicate that the literacy and numeracy competence of students is still very low and needs to be improved. This is evidenced by the 2019 AKSI survey conducted by the Ministry of Education Assessment Center on junior high school students in North Sumatra Province showing the average value of literacy and numeracy skills is still below national standards. Look at chart 1:

![Fig. 1. Graph of Grades Per Eye of the Junior High School Examination in North Sumatra Province](image-url)
Furthermore, the problem shown is the need to strengthen the character of students. This character strengthening is aimed at reducing cases of bullying (bully) in the school environment. Then, in addition, human resources (HR) are also relatively low. This is seen by the lack of integrated services in educational institutions, the lack of supervisory functions over the services provided, the lack of strengthened educational governance and, most importantly, the lack of quality in educators and educational personnel and other weaknesses during the learning process.

Faced with this situation, the field of Indonesian education also needs to change. The change aims to achieve the SDG's target in the field of education in the era of Society 5.0. Therefore, it needs to be discussed about the challenges of Indonesian education solutions to 8 standards of education quality in the face of the Era of Society 5.0 using society 5.0 support technology, namely the Internet of Things (IoT), Artificial Intelligence (AI), Robotics, and Distributed Ledger Technology (Blockchain).

2 Method

This research describes solutions and challenges to improving the quality of education in the era of society 5.0. The research method used in this study is qualitative research. Qualitative research is research that holistically intends to understand the phenomenon of what the subject is experiencing, be it his behavior, perception, motivation, or action, and to describe it in the form of words and language, in a special context that is natural and by utilizing various natural methods [3].

The data collection techniques used in this study use literature study methods. The method of literature studies, which collects information or data through books, research materials, seminars, journals, or articles relevant to the issue being studied [4]. This technique is carried out with the aim of revealing various theories that are relevant to the problem being faced or researched as reference materials in the discussion of research results.

Data analysis techniques conducted by researchers using interactive models. Interactive models are divided into three stages, namely: (1) data reduction is a form of analysis that sharpens, classifies, directs, disposes of unnecessary data, and organizes data so that final conclusions can be drawn and verified; (2) the presentation of data is a collection of structured information and gives the possibility of conclusions and action; (3) draws conclusions and verification [5].

3 Result and Discussion

Factual Conditions of Education Towards the Era of Society 5.0

Towards the era of society 5.0 in the field of education, there are many challenges and changes that must be made. This is because the success of an application is determined by the initial state or readiness of educational institutions reviewed based on eight educational standards. These 8 educational standards will be a reference to whether they are adequate to be developed in preparing for superior and quality education.

The problem with education that is currently happening in Indonesia, especially in North Sumatra Province, is the lack of qualified professional teachers and the use of conventional and non-varied learning methods. Teachers are the agents who will make changes to the education
system. So teachers are required to be able to change their ways and views to improve the quality of Indonesian education.

In the era of society 5.0, teachers are required to be able to improve their professional abilities and teaching skills by using various varied methods and technology-based facilities while the learning process takes place. Teachers are not only required to provide knowledge but also must guide and facilitate the thinking power and learning motivation of learners to develop in accordance with the changing times. Hadi explained that at the micro level, in the framework of learning activities, the use of computer technology and the internet is still not fully conditioned in the classroom in all schools in Indonesia. Students will find it easier and more enjoyable to learn if they use computers and internet technology [6].

Other issues that are discussed include not only the quality of educators and education, but also the quantity. This is related to the equalization of teachers, which is seen in the number of teachers who are inadequate. The position of teachers is very vital in education, especially in terms of quantity. The problem that arises is the number of schools that lack teachers and even teachers who teach in accordance with their skills. One of the causes of the teacher shortage is Indonesia's vast geographical area [7].

Another problem involves the limitations of school facilities and infrastructure. The process of education in the face of the era of society 5.0 will be affected if the facilities and infrastructure are inadequate. Many problems will occur if there is a lack of facilities and infrastructure. Especially with the development of science and technology, learning activities certainly require efforts to use props and other practical tools that are sought to maximize the learning process. This is seen as inadequate in some schools in North Sumatra Province, especially those located in inland areas.

The considerable gap can be seen when compared to schools in urban areas. Some schools do not even have library buildings, laboratory buildings, or even fields used for certain sports because of limited land. Then the condition of the building is very unfit for use, such as leaking, which causes learning activities to be hampered. Although these facilities and infrastructure are what support the learning activities of learners both in class and outside the classroom.

The problem also lies not only in inadequate facilities and infrastructure, but also in the procurement and management process that must be carried out continuously. Observations show that schools may even have sufficient facilities and infrastructure but lack good management and maintenance. The school even ignored and paid less attention to this. Meanwhile, when viewed from its usefulness, the role of business management, procurement, use, and maintenance of facilities and infrastructure will make schools produce quality education and learning can occur as effectively and efficiently as possible.

Then, when talking about the procurement of facilities and infrastructure, other problems that arise are limited budget problems. Where the school budget is preferred to the operational costs of the school, the procurement of facilities and infrastructure becomes the last priority. In this modern era, the completeness of technological devices and other infrastructure will determine the progress or absence of an educational institution.

Another factor that is also very important in the 21st century is the lack of creative thinking, innovative thinking, and critical thinking about the actual issues that are occurring around us. This condition is not only trained and developed for learners. But to all stakeholders in educational institutions, today's education stakeholders are more interested in discussing and thinking about the differences between one institution and another. Whereas the desired condition is to bring up creative, innovative, and critical ideas to advance the quality of education.
With the many problems faced by Indonesian education, especially in North Sumatra Province, there are doubts about the readiness of educational institutions to welcome the era of society 5.0. The challenges that will be faced will be more severe if the standard of education used as a reference to improve the quality of education is less maximal. The implementation of society 5.0 is not only aimed at students; all stakeholders are expected to be equally capable of dealing with this era on an individual, academic, and community level. This is in accordance with Raka's statement that quality education, according to the times, is seen in the products produced.

Whereas in its development, it is not only limited to complementing existing ones and increasing the targets that have been met, but it is also looking for opportunities that can produce something unique in this era [8].

**Educational Difficulties for Society in Era 5.0**

Of all the problems outlined earlier, it can be seen that the challenges of secondary education in North Sumatra in entering the era of society 5.0 are still quite a lot. How to realize all the indicators of the society 5.0 era, which include the internet of things (IoT), artificial intelligence (AI), robotics, blockchain, and big data with factual conditions.

The challenges that must be overcome are as follows:

a. **Infrastructure Improvements**

   The need for infrastructure improvements throughout north Sumatra in order to create equitable distribution throughout the region so that there are no more hamlets or schools that are difficult to reach or difficult to get internet network. Of course, this requires collaboration from a variety of parties, including local governments, the federal government, providers, and the community. Infrastructure improvement is also one of the important factors in quality learning. By utilizing ICT and facilitating internet access, large-scale learning activities can be done anytime, anywhere. Information and knowledge can be communicated via email, Google Drive, e-Book, e-library, and other social media features without going through a face-to-face process [9].

b. **Improvement of Educational Facilities and Infrastructure**

   Educational facilities and infrastructure in schools in north Sumatra still exist and do not meet existing standards, while we are entering the era of society 5.0, where all use the internet as a continuity of learning activities and digital equipment. Therefore, the school must be able to meet these requirements in terms of facilities and infrastructure, where all schools are connected to the internet and provide their own internet network, as well as have their own computer laboratories and other laboratories that can improve the competence of learners in terms of the development of innovation and digital creativity. Facilities and infrastructure are the first steps so that educators can try to get out of the "safe zone" and explore new learning potentials using a variety of different methods [10].

c. **Developing Professional and Superior Digital Educators**

   In entering the era of society 5.0, educators, as the spearhead of this education system, must have superior quality in digital in order to hatch superior human resources later. So teachers have demands to be able to master technology. Not only technological literacy, but teachers must also have creativity and innovation that are continuously developed and have skills in leadership, digital literacy, communication, emotional intelligence, entrepreneurship, global citizenship, teamwork and problem solving.

   A challenge for secondary education in north Sumatra is how to prepare the quality of teachers who master this technology thoroughly throughout the region. Varied learning strategies need to be applied by teachers in the era of society 5.0, namely by developing the potential of learners using teaching materials obtained from various platforms, both online
media and the real world [11]. If viewed at this time, then the search for teaching materials and learning videos has been found in various e-learning applications in Indonesia, such as Ruang Guru, Zenius.net, and Brainly [12].

So that it becomes the teacher's job to improve the quality and ability to use technology so that the quality of learning will also be better by utilizing technology in the era of society 5.0.

d. Preparing for 21st Century Life Skills

All elements of education, without exception, must equip themselves with 21st century skills, including creativity, critical thinking, communication, collaboration, leadership, digital literacy, emotional intelligence, global society, entrepreneurship, teamwork, and problem solving. That way, the output that will be generated from our education system will excel because it is ready to face the challenges of the society 5.0 era.

How to prepare for life skills in the 21st century must be considered by all elements of education to be applied into a habit that may be incorporated into the curriculum and so on. One of them can be done by teachers by creating competitive thinking through HOTS (Higher Order Thinking Skills). HOTS-based climbing can be applied by teachers to hone critical thinking skills. According to Syahroni, critical thinking is an important contribution in educational institutions to improve the quality of education, accompanied by technological developments [13].

e. Strengthening digital ethics regulation and law enforcement

Entering the era of society 5.0, which emphasizes the massive use of the internet, it is inevitable that various digital crimes can also occur, starting from data theft, fraud, hacking, and other digital crimes that can harm many people, both from the lay community, educators, learners, and business people. For this reason, there needs to be clear and legal regulations and rules from the government and a strengthening of the law on digital transactions. This digital era is expected to change the character of society and learners' moral values as they become students of Pancasila's character, who are noble, pious to God, YME, global diversity, independent, critical-reasoning, and cooperative.

4 Conclusion

Based on the above exposure, it can be concluded that the most basic things that need to be done by the first secondary education institution (SMP) of North Sumatra Province to answer the challenges of education in the era of society 5.0 are: (1) improving infrastructure by using it evenly in each school; (2) completing facilities and infrastructure as a support for learning learners; (3) it is required to think critically, creatively, and innovatively as an initial provision to keep up with the times and compete in the future; (4) having digital ability as a skill to acquire and present positive learning/content so as to produce a capable output in literacy; and (5) form of character education, so as to apply moral values as students of pancasila character who are noble, accountable to God, YME, and cooperation.

Acknowledgement

The advice that can be given based on the presentation is that all elements of society, especially in the field of education, both the government (education office), principals, teachers, school committees, students, and non-education personnel in North Sumatra immediately fix all factors so that they can compete both nationally and globally in living life in the era of society 5.0, as well as not only improving competence in knowledge, but must be able to develop technological skills.
References


The House of Entrepreneurship Implementation as A Model of Rural Women’s Empowerment. A Case Study at Community Learning Center

Anan Sutisna¹, Henny Herawaty BR Dalimunthe², Elais Retnowati³
{asutisna@unj.ac.id}

Fakultas Ilmu Pendidikan, Universitas Negeri Jakarta¹²³

Abstract. This study described the house of entrepreneurship implementation in rural women's empowerment at the Community Learning Center (CLC). The focus is on input, process, product, and impact on women's rural livelihood and family incomes. This study used research and development method and, the subject was women who run businesses at home. The Data Analysis technique conducted quantitative and qualitative approaches. This house of entrepreneurship implemented was restrictedly through a trial involving 10's female learning participants. The study found that the empowerment process aspect reaches 32.8% and the empowerment input aspect reaches 30.6%, which means appropriate. The product and impact aspects 23.9% and 12.7%, reach respectively. And, inappropriate 27.3% and 19.7%, mean below. Thus, it concluded that the impact on house of entrepreneurship implementation in rural women empowerment achieved success in the input and process aspects.

Keywords: Community Education, House of Entrepreneurship, Rural Women’s Empowerment

1 Introduction

The opportunity to obtain formal education may not always open for community members. Non-formal education therefore becomes an alternative to educate community members, particularly those the economically unfortunate, the remote residents, in addition to the presence of other educational obstacles like community perception toward education itself [1]. The Community Learning Center (CLC) is available located in each region, established by, for, and from community to meet the needs of the community’s right to education. CLC in order that community members with the existing hindrance are able to attain the education, provides various such learning programs as literacy, equivalence, and entrepreneurship.

Equalization of opportunities in education is an attempt through which equality through accessibility and fairness are normally made available to all, particularly through program integration the government has planned with activities the community is performing. Such integration has been likely to conduct in the programs, among of which are empowering literacy program, entrepreneurship- skill-development-like program. Hence, it is expected that the output of the programs will produce smart, skilled, and independent human resources. A number of programs in non-formal education can be focused on the community’s empowerment activities aiming to promote community’s ability to solve problems the community encounters
in order to form a civil society [2]. It is the society that believes in its members’ ability to create better living and to realize its rights and obligations in community life. This kind of community empowerment will come to realize if the community members have wider and empowering opportunities.

Community’s empowerment for women in particular means that women’s ability to understand and control the social, economic, and political conditions which is highly required as an effort to better promote their position in the community [3]. In other words, the empowerment process itself refers to every attempt in community education aiming to raise women’s awareness and sensitivity toward social, economic, and/or political development which will eventually lead them to having ability in the improvement of their position in community. Empowered women are women who live in a civil society, that is a circumstance where women believe in their ability to create better living and to realize their rights and obligations in community life in which the women’s empowerment will come to realize if they have the right to education. Women’s empowerment is identical to women’s education since what is called education in inclusion of community education may refer to an endeavor to empower human resources and develop human talents.

Women’s empowerment process through the house of entrepreneurship is truly an attempt to enable women with all of their existence to empower themselves facilitated by the center for activities managed by the community, stemmed also from the community, conducted by and designated for the community itself. A model of rural women’s empowerment is therefore needed by utilizing the house of entrepreneurship for selling food/snack and grocery for instance.

This fact proves that the learners not only study but also do business at home. The empowerment model for the women living in rural areas can be implemented in the form of the house of entrepreneurship [4] which can be taken into account as a material for policy making in the implementation of entrepreneurial literacy learning at PKBM.

Learning experience is not solely derived from class but also more extensively from the environment where the learners live in [5]. Learning can be executed at home, along with its environment, in order to give the learners opportunities to manage their learning time in their environment. This also gives an experience of having their home not only as a living but also learning place [6]. Some cases take place in Indonesia, where schools are located at a distance, so that this circumstance constrains students to study. Given to the other function of the home as a means of learning nonetheless provides a space for the community. Home can serve as a learning medium for it is close to the community environment.

An approach of having people’s participation can be employed in the sense of how they are engaged in entrepreneurial learning. Home is unlikely to be separated from one’s life either as individual or one’s identity. “My home sweet home” will come true from a convenient, friendly, and clean environment about which the resident feels. Home can be used for doing many activities to build the life nearby. Home can function as a place, space, and signify simplicity and identity [6]. The concept of home has altered from not merely a living place but also into a more functioning space to congregate and study together.

The main objective of the study is to investigate the process of entrepreneurial literacy learning implementation at home with a view to rural women’s empowerment. Focus of the study includes input, process, product, and impact that the community has in the implementation of home-based community learning center, as well as activities that the community execute to develop entrepreneurship in rural areas. It is expected that findings of the study will describe the implementation of entrepreneurial literacy in rural areas to enhance women’s entrepreneurial
knowledge and skills. Research problem of the study is thus “How is the house of entrepreneurship implemented as a rural women’s empowerment model?”

2 Literature Study

Women Empowerment

Empowerment describes a process of an individual and community’s effort to follow the track leading to higher achievement, individual satisfaction, and work. A process is defined as a sequential change or event of development. Hence, an empowerment process is a sequential change in developing efforts to promote more empowering community. Wilson argues that there are four stages in the empowerment process, namely:

a. Awakening, people at this stage have been made realize with their abilities, attitudes, and skills they have as well as their plans and hopes upon their better and effective conditions.

b. Understanding, further from the awakening stage, the people are given a new understanding and perception about themselves, their aspiration, and other common situations. This understanding process includes a learning process to entirely respect for the empowerment, and to understand what they are demanded by the community.

c. Harnessing, having realized and understood about the empowerment, it is time for the community to utilize it for its sake.

d. Using or making use of the skills and abilities of empowerment as a part of daily life.

Empowerment is a process so that it cannot be understood as a single project with a beginning and ending. A way of philosophy requires a relatively long development and process in its implementation and adjustment [7]. There are three approaches in women’s empowerment. Firstly, humanistic approach which drives one to spontaneously and voluntarily give aid to certain group of community who calls for help due to force majeure or being unfortunate. Secondly, community development approach which is intended to develop independence driving to self-supporting community. Thirdly, people empowerment which aims to strengthen bargaining power of the low-class society toward pressuring force in all aspects and sectors of life by defending and protecting the weak.

Entrepreneurial literacy

A literacy educator plays role in developing skills, knowledge, and becomes an effective teacher for different classroom management. Off-class literacy has a good focus on the involvement of teachers and learners in the literacy practice of the community. The literacy educator develops good partnership with the community to prepare literacy teachers in the future by positioning reliable or successful learners. The educator engaging with the community must play his or her role in coordination, communication, planning, community
partnership including traditional and non-traditional study rooms which are able to develop meaningful learning experiences for the educator and learners in the community [9].

An innovative learning and pedagogy are a process of “designing” in multiliteracy which needs a transformative process. Multiliteracy can construct systematic knowledge also inspire and facilitate teachers in the context of practical teaching [10]. Literacy generally encourages development and economic welfare. Literacy program is assumed as a literacy skill which can easily be applied regardless of social context. Literacy practice is constructed in a social manner and is used for coping with unfairness and can inspire the social changes. [11].

Financial literacy is used for providing a service to the adults and the young with low income by regarding their needs also providing a convenient environmental service. Innovation has been crucial to create a new market that serves the young with low income in developing countries. Financial literacy is defined as knowledge, skill, and ability serving as a guide to a complex financial market in order to empower the consumers in making a responsible financial decision. Literacy plan makes an individual aware of and responsible for social risks. [12].

Entrepreneurial literacy serves as an understanding about buyers and sellers having further information about market by utilizing their social skills dan relating the content of entrepreneurial education to life experiences so that it can be a lifelong learning [13]. Entrepreneurial literacy by empowering a practitioner as a facilitator will give the practice a positive effect since a practitioner plays role in forming professional identity, emphasizes the function of educators as a businessman, and solely takes responsibility to build the professional identity.

Community Learning Center

The system of rural living is commonly in a group and familial manner. Most of the people work as crop and plantation farmers for their livelihood. The job they do besides being farmers is an extra to spare their time and anticipate harvest failure due to weather and insect attacks. What seems to be interesting taking place among the rural people in Indonesia is the presence of “mutual aid”; people mutually and voluntarily help one another fulfill every need for particular activities, either in material or non-material well-being.

This mutual aid system has become community empowerment program prioritizing the urgency of all people’s participation from the planning to evaluation stages by using the power of community in its management. [14]. People who gather, interact each other, have the same goal, learn from one another will form a community. As a group having these similarities to meet the goal, the forming of the community might also be due to the same interest in a given field or business.

The presence of community learning center in Sukamakmur, West Java has been utilized by the people as a learning center. The community learning center can contribute to the quality improvement of individual and community’s social capital as well as facilitate the action taken collectively and usefully [15]. Learning center can give people opportunities to have extra learning off the formal education especially for the adults and rural community. Community learning center has served as a gathering place for the community. Learning community comprising collection of people has made the house of entrepreneurship as a learning center with limited facility, budget, and facilitator availabilities.

Nevertheless, this does not hinder this group to run the learning activities. The rural people feel excited about the establishment of this learning community and make the house of entrepreneurship as a learning center where people gather, and as an example for the children at home environment to study
Some benefits may be obtained by the community as for the existence of the house of entrepreneurship as a learning center. The people will certainly get engaged with the learning process to promote knowledge and learning skills. But the most benefit lies in the ideas that the presence of community will greatly affect the environment where the community lives in, give a positive example to the early childhood, teens, and adults that everyone has learning opportunities regardless of the age nor educational background. Learning has been a form of self-actualization for the adults, developing self-potential to cope with the future.[16].

3 Research Methods

This study of the house of entrepreneurship implementation in rural women’s empowerment is aimed firstly to have a description about entrepreneurial learning activities that rural women are likely to perform. Secondly, it is to analyze the entrepreneurial learning in rural women’s empowerment at PKBM. A qualitative method with descriptive technique was employed in this study of which data collection was conducted by means of observation to 10 learning participants referring to the observation manual consisting of four aspects with indicators as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Aspects</th>
<th>Indicators</th>
</tr>
</thead>
</table>
| 1  | Input  | 1. Being active in the empowerment program enacted by PKBM  
     |         | 2. The empowerment program is highly exciting  
     |         | 3. The empowerment program participated in meets the needs  
     |         | 4. Participating in the empowerment program based on own initiative  
     |         | 5. Participating in the empowerment program because of others’ request  
     |         | 6. Participating in the empowerment program is important  |
| 2  | Process | 7. Participating actively in the empowerment program  
     |         | 8. Giving suggestions to the empowerment program management  
     |         | 9. Inviting others to participate in the empowerment program  
     |         | 10. The house of entrepreneurship can empower women  
     |         | 11. Getting more motivated in participating in the empowerment program  
     |         | 12. Prioritizing empowerment activities rather than others  |
| 3  | Product | 13. Having ideas following the empowerment program  
     |         | 14. Getting benefit from the implemented empowerment program  
     |         | 15. Getting more self-confident while participating in the empowerment program  
     |         | 16. Feeling satisfied with the empowerment program to have participated in  
     |         | 17. Promoting the empowerment program to others  |
| 4  | Impact  | 18. Participating in the empowerment program can raise income  
     |         | 19. The outcome of empowerment program can shape positive attitudes  
     |         | 20. The empowerment program impacts to daily life  |

These indicators were employed to measure rural women’s empowerment which would later be analyzed based on the observation toward the learning participants at PKBM as a sample of the study.
4 Research and Discussion

Rural Women’s Empowerment

10 learning participants were selected as sample of the study for data observation of the rural women’s empowerment at PKBM. The observed participants’ profile was based on educational qualification, age, gender, and occupation. The observation of the educational qualification of the entrepreneurial learning participants consisted of 2 senior high school (SMA) graduates, 6 junior high school (SMP) graduates, and 2 elementary school (SD) graduates. Whereas, the age ranged from 21-45, the gender was all female, and the occupation was all entrepreneurs or merchants.

Table 1. Percentage of Rural Women’s Empowerment Aspect through the House of Entrepreneurship

<table>
<thead>
<tr>
<th>No</th>
<th>Aspect</th>
<th>Appropriate</th>
<th>Inappropriate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Score</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Input</td>
<td>41</td>
<td>30.6%</td>
</tr>
<tr>
<td>2</td>
<td>Process</td>
<td>44</td>
<td>32.8%</td>
</tr>
<tr>
<td>3</td>
<td>Product</td>
<td>32</td>
<td>23.9%</td>
</tr>
<tr>
<td>4</td>
<td>Impact</td>
<td>17</td>
<td>12.7%</td>
</tr>
<tr>
<td></td>
<td>Jumlah</td>
<td>134</td>
<td>100%</td>
</tr>
</tbody>
</table>

The above table shows that the calculation of rural women’s empowerment through the house of entrepreneurship with 20 items of indicators and 10 participants scores maximum 200, which is categorized into “Appropriate” and “Inappropriate”. Result of the analysis indicates that the empowerment process aspect scores 44 or 32.8% and empowerment input aspect scores 41 or 30.6% which mean “Appropriate”. Meanwhile, the percentage of the product and impact aspects are respectively 27.3% and 19.7%.

This means that the house of entrepreneurship implementation in rural women’s empowerment has not yet resulted products and impacts of “Appropriate”; for instance, the program enables the families to raise their income and has impact on daily basis. Thus, it can be concluded that the implementation of the house of entrepreneurship in rural women’s empowerment shows success in its input and process aspects achieving 32.8% and 30.6% respectively.

The following result is shown in the graph below:

Fig 1. Graph of Empowerment Percentage
House of Entrepreneurship Implementation in Women’s Empowerment

House of entrepreneurship stems from an argumentation that the community must play role in the development for the advancement of the nation dan country. Some efforts are to make on how to promote skilled and productive human resources for the welfare of society. Knowledge and skills are thus significant to prioritize by allowing various ways in order to be able to learn from a lot of resources, through either formal and non-formal education. The house of entrepreneurship as a learning center for the community has particular characteristics, geographical location, and limited learning facilities; however, this does not restrain the people to keep learning. Thereafter, it is necessary that multiliteracy to design community learning be conducted.

Multiliteracy needs a transformative process, can construct systematic knowledge and facilitate the teachers in a practical instructional context [10]. A literacy educator plays role in developing skills, knowledge and becomes an effective teacher for different classroom management. The educator engaging with the community must play his or her role in coordination, communication, planning, community partnership including traditional and non-traditional study rooms which are able to develop meaningful learning experiences for the educator and learners in the community [17]. Literacy generally encourages development and economic welfare including literal literacy that can easily be applied to inspire social changes [11].

Entrepreneurial literacy serves as an understanding about buyers and sellers having further information about market by utilizing their social skills dan relating the content of entrepreneurial education to life experiences so that it can be a lifelong learning [13]. Entrepreneurial literacy by empowering a practitioner as a facilitator will give the practice as well as the fate a positive impact. A practitioner plays role in forming professional identity, emphasizes on the function of educators as a businessman, and solely takes responsibility to build his or her professional identity. The house of entrepreneurship is a model of empowerment to improve the rural women’s knowledge and skills, giving them opportunities to pursue formal education due to scarce courses and learning center available in rural areas, also the low income of community.

This rural women’s empowerment model through the house of entrepreneurship can be utilized by community to have entrepreneurial learning in the rural learning community. The result of implementing this house of entrepreneurship in rural women’s empowerment shows success in the input and process aspects reaching 32.8% and 30.6% respectively. The house of entrepreneurship model can be applied by the rural communities in Indonesia having similar problems and characteristics to help increase the knowledge, skills and economy of the family in the rural areas by participating in the learning at the house of entrepreneurship.

Community will communally and voluntarily give either physical or financial assistance to every activity. The mutual aid implemented in community has become the empowerment program prioritizing the importance of community’s participation from planning to evaluation stages by utilizing the power of community in its management. The people congregate, reciprocally interact, and share the same goal. When learning takes place, it will shape a community. The group may share similar goal in order to shape the community since it also has similar interest in a particular field or business. Community in informal learning is meant to have the learners participate in the practical community to understand collective knowledge and skills [18].

This community existence leads to the community learning center by the rural people in Indonesia peculiarly in Sukamakmur, West Java. The community learning center can contribute to the quality improvement of individual and community’s social capital as well as facilitate the
action taken collectively and usefully Learning center can give people opportunities to have extra learning off the formal education especially for the adults and rural community. Community learning center has served as a gathering place for the community.

Some benefits may be obtained by the community as for the existence of the house of entrepreneurship as a learning center. The people will certainly get engaged with the learning process to promote knowledge and learning skills. But the most benefit lies in the ideas that the presence of community will greatly affect the environment where the community lives in, give a positive example to the early childhood, teens, and adults that everyone has learning opportunities regardless of the age nor educational background. Learning has been a form of self-actualization for the adults, developing self-potential to cope with the future [19].

5 Conclusion

House of entrepreneurship is a model of women’s empowerment to increase knowledge and skills in the rural areas. It provides opportunities to the community to pursue formal education due to the limited courses and learning center available in the rural areas and low income of the community. The house of entrepreneurship can practically be used by the community to learn entrepreneurship and to establish rural women’s community learning center. The implementation of the house of entrepreneurship shows that the percentage of empowerment process aspect is 32.8% and input aspect is 30.6%, which mean “Appropriate”. Whereas, the percentage of product aspect is 232.9% and the impact aspect is 12.7%, which mean below “Inappropriate” of 27.3% and 19.7% respectively. The findings show that the house of entrepreneurship implementation in rural women’s empowerment has not met “Appropriate” in its product and impact aspects, for example, to raise the income of the family and to have impact on daily life. Thus, it can be concluded that the implementation of the house of entrepreneurship in rural women’s empowerment shows success in the input and process aspects.

References
The Role of Parents in Applying
*Kato Nan Ampek* To the Alpha Generation in
Village of Dalam Koto

Yasaratodo Wau¹, Isra Mirna Noventri², Nurlaila³, Fauzi Kurniawan⁴, Jubaidah Hasibuan⁵
{yasaratodo@gmail.com}

Faculty of Education, Universitas Negeri Medan-Indonesia¹²³⁴⁵

Abstract. This study discusses the role of parents in applying *kato nan ampek* to the alpha generation in the village of Dalam Koto. The objects is 3 parents who have children aged 8-10 years and the subjects is children aged 8-10 years. This research is qualitative descriptive with data collection techniques is observation, interview and documentation techniques as well as research instruments. The results are parents to alpha generation in the Minangkabau family include: (1). The role of parents as decision makers in discuses dominant decision making is carried out by both, (2). The role of parents as educators dominantly carried out by mothers, (3). The role of parent’s models has been carried out well and children have applied this in their lives public (4) The role of parents as the dominant family leader applies a democratic type of leadership, which emphasizes too much on children in doing something

Keywords: Role of Parents, Alpha Generation, Kato Nan Ampek

1 Introduction

Generational differences in the environment become one of the subjects that always appear in the development of human resource management, and the concept of generational differences continues to develop from time to time. There are several kinds of generations that exist in life, including generations X, Y, Z and Generation Alpha and each generation has certain characteristics. each generation requires different handling and the role of parents in accordance with the child. In the village in Koto, the development of the alpha generation varies depending on the role given by parents and the application of *kato nan ampek* in everyday life.

*Kato nan ampek* is a way of behaving and speaking in relationships. From the way someone talks and behaves, we can see the good and bad of a person’s character, therefore, how to be polite is very important to learn. The contents of this *kato nan ampek* are, according to Putra¹ in Minang culture it is known as *Kato Nan Ampek* or which means four words which are the levels of language use. The levels are as follows (1). Kato Mandaki (Word Climbing), is an educational expression on how to behave and talk to people who are older than old.

For example, to father, mother, uncle, and others. (2). Kato Manurun (Word Descending), is an expression that describes how to behave and talk to a younger interlocutor or it can also be interpreted as nurturing. For example, parents to children and teachers to students. (3). Kato Mandata (Word Horizontal), is an expression that describes how to behave and speak to the interlocutor who is parallel. For example with peers. (4). Kato Malereng, is an expression of
attitudes, actions, ways and ways of talking to people who are intended in everyday interactions. For example between son-in-law, brother-in-law.

**Understanding Learning**

Parents are very important people in determining a decision in the family as said by Isa\(^2\). Parents are the two people who are most responsible for their children, parents also have a role, the role of parents is According to Lestari\(^3\) the role of parents is the methods used by parents are closely related to the views of parents regarding the tasks that must be carried out in raising children.

Thus it is clear that parents have a position and responsibility. In Aslan\(^4\) explains that the role of parents is very necessary in controlling how to socialize and communicate with children, because of the rapid development of digital and technology, children will get intake from digital media that cannot be digested properly by the child so that many impacts such as addiction to playing gadgets, children will be happier and focus on playing various applications provided in the gadget so that things around them will be ignored and will result in social inequality.

Parents have a very important role in educating children, one of which is to be and provide a good example for children, besides giving warnings and advice to children is also an important thing that parents must do to always live clean to children, as well as In terms of getting along and socializing with the community, parents must teach good things and imitate things that are exemplary so that good behavior and morals emerge. Parents also have a responsibility, which means that it is the obligation of parents to get used to applying social etiquette and association with each other since they were small.

Meanwhile, according to Fadlurrohim, et al\(^5\) The alpha generation (2011 – 2025) is the generation that is most familiar with digital technology and the generation that is claimed to be the smartest compared to the previous generation. As many as 2.5 million children of the alpha generation are born in the world every week. In the observation, the Alpha generation cannot be separated from gadgets, lacks socialization, lacks creativity and is individualistic. The alpha generation wants things that are instant and doesn't value process. Their preoccupation with gadgets makes them socially alienated.

**Understanding Of the Role of Parents**

According to\(^6\) explains that there are several roles of parents in Minangkabau consisting of: (1). Parents as Decision Makers, This role is very necessary in order to create the right conditions and choices desired by the family itself, in Minangkabau which adheres to the matrilineal kinship system who prefers to choose and make decisions, namely a mother. there is still a joint decision-making process by the mother and father or deliberation carried out by the family. (2).

Parents as Educators, These parents in Minangkabau have a source/guideline in educating their children, namely syara' (religion). because in a long period of time and customs and syara' (religion) have been ingrained in the life of the Minang people, therefore the culture of the Minangkabau community has been based on religion since ancient times. (3). Parents as role models, As parents, it is necessary to set an example and role model for children, both in telling the truth and in carrying out daily life and in society.

Every parent must present themselves that he is an example or model of his opponent identification figure. (4). Parents as Leaders, In Minangkabau families, the majority use a democratic leadership style that is free and not burdensome to one part.

**Know About Alpha Generation And Kato Nan Ampek**

According to Widodo, G.S, et al\(^7\) Generation Alphaa are millennial generation children born after 2010. They are the generation most familiar with the internet of all time. The generation that is most familiar with digital technology and the generation that is claimed to be
the smartest compared to previous generations. However, they are considered to have shortcomings, such as: bossy, dominant, and like to manage; do not like to share; unwilling to follow the rules; technology is a part of their lives, and would not know the world without social networks.

However, they are considered to have shortcomings, such as: bossy, dominant, and like to manage; do not like to share; unwilling to follow the rules; technology is a part of their lives, and would not know the world without social networks; and the ability to communicate directly is much reduced. On the other hand, digital media offers vast opportunities and provides positive benefits, in addition to digital risks.

The development of the Alpha generation in each region has differences caused by the interactions and habits that exist in the community as well as differences in customs and also the assertiveness of parents which results in different social developments experienced by the Alpha generation. As is the case in one of the villages, namely Dalam Koto village, Payakumbuh District, 50 City Regency, which at first was still thick with customs, and applied good and firm things to everything related to social life, but nowadays the Alpha generation is following the current trend. globalization or modern life does not pay attention to what was done before, namely following the social habits that exist around it, this is also caused by parents who also follow the flow of globalization so that they give up their children's development by using gadgets.

In connection with the development of technology and increasingly sophisticated times, the development of the Alpha generation in Desa Dalam koto is very different from the previous generation, namely the Z generation which does not pay much attention to technology, but the Alpha generation is very guided by technological sophistication by using Android/Smart Phones, Laptops, etc. and use various services such as youtube, google, whatsapp, etc. which greatly affect the social life of the alpha generation. With the development of technology that is felt by children of the Alpha generation, it results in the emergence of various negative effects such as excessive use of gadgets, resulting in reduced social activities or less socializing with the surrounding community.

In Minangkabau known *kato nan ampek* (four words) as a communication style, and this is one of the local wisdom. used according to the high-low position of the social status of the sender and recipient of the message in communication The use of the four communication styles is adjusted to the purpose of communication, the social relations of the two parties, and the nature of the formality or informality of the relationship context.

## 2 Research Methods

This research was conducted in July-August 2021 the village of Dalam Koto, Taeh Baruah, Payakumbuh District, Limapuluh Kota Regency. The subjects of this study were 3 parents who have children aged 8-10 years, and object in this study is 3 Children aged 8-10 years. This research is a type of descriptive qualitative research, namely by conducting observations, interviews, and documentation.

Observations were made to observe the daily lives of parents and their children and to observe whether parents teach or apply the use of *kato nan ampek* to their children. The interview, technique carried out was guided free interviews, meaning that the questions asked were not fixed on the interview guidelines and could be deepened or developed according to the situation and field conditions, the interviews were conducted on the research subject, namely parents who were in Dalam Koto Village, documentation is obtained directly from observation...
activities and interviews that have been carried out on research subjects. The things that are documented in this study are in the form of daily activities for parents and children.

3 Result and Discussion

Based on interviews conducted with 3 parents and 3 children, it can be seen that the role of parents is very helpful for children in applying *kato nan ampek* because *kato nan ampek* is very necessary in the social environment or in communicating to the other person. By carrying out several roles, parents are obliged to educate children from all things including in teaching *kato nan ampek*, parents as educators have an important role for families, especially to children, because in carrying out all things good communication is the pillar of socializing, if children do not apply communication. If it is good, there will be reduced participation in children's playmates.

As parents, informants are very trying and obliging to educate children to apply *kato nan ampek* to the environment or their interlocutors other than that *kato nan ampek* is a cultural heritage in the Minang community, whenever and wherever children must know and apply it, such as to older people, children must calling them "uda/uni", from interviews and observations that have been made to the 3 informants aged 8-10 years, they have applied *kato nan ampek* to their interlocutors, whether they are older people, younger people or their peers.

There is a special role for parents which is explained by Irawaty [6] who get the results, namely:

a. The role of parents as decision makers, This role has been carried out well, it is known through the statement given by the parent which states that as a parent you must be firm and responsible for all decisions taken and must be applied by children in everyday life. In interviews conducted with DM and EW informants who stated that in their family to make decisions, it was carried out by both parties from the parents, namely the mother and father because as it should be that to make decisions is something that must be considered carefully because it will involve a life that is. Furthermore, it is different from the IT informant who stated that in making decisions in his family he is more dominant as a mother, because according to him, children will obey the decisions that will be given by him but as a father will also occasionally help in making decisions that will be taken by conducting deliberation.

b. Parents as educators, Parents as educators in the 3 informant families have done well and are responsible for parents to children, educating children is something that parents must do to children from an early age so that children get used to doing good things that can shape their personality and attitudes and behavior. good qualities in children. In Minangkabau custom, usually the more dominant in educating children is the mother because the mother is always at home taking care of all the needs and the mother is in charge of teaching the child in everything because basically the child will be closer to the mother while the father is in charge of earning a living and supporting the family.

c. Parents as role models, Based on interviews and observations as role models, informants have performed their roles well, informants DM, IT, and ER who stated that he as a parent always teaches children about *kato nan ampek* and applies it to other people in everyday life such as calling someone to talk to who is more friendly. Young people call him by name or "adiak", and call older people as "uda/uni" so that when the child sees and listens to it, the child will imitate and apply the same to the other person. But there is an imbalance that exists in the home environment and children's play environment, that in the home environment IT and ER mostly do not apply *kato nan ampek* in communicating in everyday
life, for example, such as calling the title "kau/ang" to an actual older person. The mention is a harsh term for Minangkabau customs, but based on the statement to their children they are not affected and do not follow this behavior because it has been taught by their parents.

d. Parents as leaders. The role of parents as leaders has been carried out well by the informants, it can be seen based on the results of observations which show that parents are always good leaders in various activities carried out in daily life such as always leading prayers when they want to eat and being priests when they want to pray. Various ways that have been done by parents as leaders such as always being the first to start something and always taking over what happens in various family matters.

4. **Conclusion**

a. The role of parents as decision makers has been done well by parents, in the informant's family in making decisions carried out by both parties from parents namely mother and father because as it should be that to make decisions is something that must be considered carefully because it will involve the in the next life, it is different from the IT informant who stated that in making decisions in his family he was more dominant as a mother, because according to him the child would obey the decisions that would be given by him but as a father would also occasionally help in making decisions that would be taken by doing deliberation. So the role of parents as decision makers is needed to make children become people who can respect decisions and do good things in the family.

b. The role of parents as educators has been done well, it can be seen from the activities and behavior of parents who always tell and teach children about good things that can be accepted by the community. The role as an educator in Minangkabau traditional life is usually carried out by a mother because the child and mother have good emotional closeness. Parents also always teach children about *kato nan ampek* which is a good thing that has been applied by children in social life. So the role of parents as educators is very and must be done by parents and has been done by parents as informants.

c. Parents who have a role as role models are something that must be done by parents, as Minangkabau people the role of role models is also based on Minangkabau customs itself. In the informant the role has been done correctly, namely teaching and introducing *kato nan ampek* to children in everyday life, informants always carry out communication in everyday life based on *kato nan ampek* to the other person, so that children imitate and do the same thing.

d. Informants who apply the type of democratic leadership which means not putting too much emphasis on and forcing decisions to be obeyed by children, and freeing children in expression and in doing things but still under parental supervision and permission. It can be seen that the role of parents as leaders has nothing to do with how children apply *uda* in everyday life, but if the role of parents as leaders is carried out properly, children will also learn to be good individuals in accordance with Minangkabau customs which basically a person must good character and do something based on the Minang proverb which says "bajalan paliharolah feet, talento paliharolah tongue" the meaning of the word is "walk, take care of your feet, say take care of your tongue" the meaning of the saying is be careful when walking, as well as looking at so as not to hurt other people. So the role of parents as leaders has been carried out well to children.
Acknowledgement
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References
E-Module Flipbook : Website-based Flipbook Development for Wave and Optics Hybrid Course

Yessi Affriyenni¹, Erti Hamimi², Isnanik Juni Fitriyah³

{yessi.fmipa@um.ac.id}

Science Education Study Program, Universitas Negeri Malang, Jl. Semarang 5 Malang, Indonesia¹²³

Abstract. The learning process can be carried out effectively if the material is available properly. One of the media used to convey material can be printed or digital teaching materials. During a Covid-19 pandemic, digital media is preferred because learning is still done in a hybrid way. A flipbook is one of the solutions to be used interactively. Digital books in the form of e-books or e-modules can be a way to present learning material in an attractive virtual form. This research developed a website-based flipbook e-module on Waves and Optics using the ADDIE development model. The e-module flipbook validity test was conducted towards media expert, material expert, and learning expert consisting of 3 lecturers. There were 56 students of the Science Education Program, Universitas Negeri Malang who joined the trial test. The validation of the experts obtained an average 90,26%. While the trial result shows 81,79% which indicates that the website-based flipbook e-module is feasible to be used.

Keywords: flipbook, hybrid course, website, digital book.

1 Introduction

For the survival of human civilization in this world, it requires a strategic long-term investment called education. With education, it is hoped that humans can adapt to all changes. Especially changes related to science and information technology. In the field of education, the development of information technology leads to efforts to develop and even create procedures to solve a learning problem. The learning problems in question are related to the latest information technology-based educational innovations. In current conditions, the development of information technology can process, package, display, and disseminate all forms of learning information in the form of audio, visual, 3D animation, even in the form of virtual learning. The development of the virtual learning concept can package the hybrid learning process to be more attractive to both students and teachers wherever they are.

The position of the media or teaching aids has an important role because it can help the teaching and learning process. Currently, there are many media or teaching aids that have been developed for independent learning, but to determine and find really good media or teaching aids so that the teaching and learning process is effective, interesting, interactive, and fun is a problem that needs to be solved together.

The benefits of learning media in the field of learning or teaching have been felt to be very helpful in the task of teachers in achieving their learning goals. In this era of technology and information, the use of technological sophistication for the benefit of learning is nothing new but has become a basic necessity in the learning process. The existence of information
technology also makes the scope of learning increasingly unlimited. This is reasonable because the location of teaching and learning activities is no longer only done in the classroom, but can also be done outside the classroom. The role of the teacher here is very crucial because it must continue to guide so that learning outcomes are met and students are also more independent in solving learning problems.

The learning process can be carried out effectively if the material is available properly. One of the media used to convey material can be printed or digital teaching materials. Teaching materials that have been made can be submitted for copyright either through Intellectual Property Rights (IPR) or ISBN. For this reason, it is necessary to develop quality teaching materials to support the learning process that is legal and protected by copyright. One of the modern teaching materials that have the potential to attract the attention of the millennial generation is digital teaching materials.

At first, the flipbook is software created to convert PDF files into the digital form [1]. The software in question is used to create interactive e-books or e-modules. What is meant by interactive is that the book or module is equipped with the help of a tool capable of displaying images, videos, text, or the like and even sound [2]. Digital books in the form of e-books or e-modules can present books as a means of learning in an attractive virtual form, following technological developments and creating motivation to learn in a positive direction [3]. Digital books in the form of flipbooks can optimally support learning if in addition to providing material for lectures, they are also able to provide learning feedback, one of which is through formative assessment. The selection and use of good quality teaching materials and assessments that can provide effective feedback are expected to minimize students' misconceptions in understanding a learning material [4], [5].

Previous research conducted by Eka [6] in 2020 made e-modules using the “KVISOFT flipbook maker” application. The app has a pro or paid version. If you use the free version, only a few features are available and the number of pages created is limited. This study resulted in significant differences in student learning outcomes before and after using e-modules. In other words, if by using flipbook students are more interested in learning. In line with the research conducted by Prasetyono [7], the use of website-based flipbook media also increases students' logical thinking abilities.

This article discusses the process of making a website-based flipbook e-module using the ADDIE development model. For the validation process to a media expert, material expert, and learning expert, as well as user trials were carried out on 56 students in the Science Education study program, Universitas Negeri Malang. Questionnaire indicators both for validation and for trials used are based on The Attributes Of Instructional Materials [8].

2 Research Methods

This development research is carried out using the ADDIE model which includes five stages, namely Analyze, Design, Develop, Implement, and Evaluate [9], [10]. Researchers used the ADDIE model because at the implementation stage it was carried out systematically and systemically [11]. Thus, careful analysis and planning must be carried out to achieve the outcome of the entire development process. In other words, there is an evaluation at each stage to minimize the error rate or product shortage at the final stage of this model. The development design is shown in Figure 1.
Preparation of indicators for filling out validation questionnaires and testing the website-based E-Modul flipbook using The Attributes of Instructional Materials [8]. From these sources, the researchers made indicators as shown in Table 1.

Table 1. Indicator based on The Attributes of Instructional Material.

<table>
<thead>
<tr>
<th>No.</th>
<th>Subjects</th>
<th>Indicators</th>
<th>Number of Sub-Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Media expert</td>
<td>Media Display</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Media in Learning</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Student involvement in the use of media</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>Material expert</td>
<td>Conformity to Purpose</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Curriculum</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contents</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interaction</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>Learning expert</td>
<td>Media Display</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presentation of Material in the media</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interest in learning media</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Student engagement</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feedback</td>
<td>1</td>
</tr>
<tr>
<td>4.</td>
<td>Student test response</td>
<td>Media interest</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Media operation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Media benefits</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enthusiastic use of media</td>
<td>1</td>
</tr>
</tbody>
</table>

The filling of the scale used refers to the Likert scale. The Likert scale was chosen because it is easier to implement and easy to carry out further analysis [12], [13]. In addition, filling out a questionnaire with a Likert scale makes it easier for test subjects, because they only need to tick or fill in by selecting numbers 1 to 5 with the provided conditions. To fill out the student response questionnaire using the Guttman scale [14], [15]. It is very simple because respondents just have to choose yes or no. The calculation of the validation score is carried out as in formula 1 [16]. While for the Guttman scale analysis using formula 2 [17], [18].
\[ P = \frac{\text{Total Score}}{\text{Ideal Max Score}} \times 100 \]  

(1)

\[ P = \frac{\text{Number of Answers Obtained}}{\text{Max Score}} \times 100 \]  

(2)

The feasibility level or the validation of the e-module flipbook is as shown in Table 2. While the feasibility level for the student response test can be seen in Table 3.

### Table 2. Level of qualification validity and feasibility.

<table>
<thead>
<tr>
<th>No.</th>
<th>Achievement Level</th>
<th>Qualification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90%-100%</td>
<td>Very good</td>
<td>No need to revise</td>
</tr>
<tr>
<td>2</td>
<td>75%-89%</td>
<td>Well</td>
<td>Revised as necessary</td>
</tr>
<tr>
<td>3</td>
<td>65%-74%</td>
<td>Pretty good</td>
<td>Enough revisions</td>
</tr>
<tr>
<td>4</td>
<td>55%-64%</td>
<td>Not good</td>
<td>Many revisions</td>
</tr>
<tr>
<td>5</td>
<td>0-54%</td>
<td>Very less</td>
<td>Total revision</td>
</tr>
</tbody>
</table>

### Table 3. Level of qualification validity and feasibility for student testing.

<table>
<thead>
<tr>
<th>No.</th>
<th>Achievement Level</th>
<th>Qualification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>80%-100%</td>
<td>Very good</td>
<td>Very feasible, no need to revise</td>
</tr>
<tr>
<td>2</td>
<td>60%-80%</td>
<td>Well</td>
<td>Feasible, no revision needed</td>
</tr>
<tr>
<td>3</td>
<td>40%-60%</td>
<td>Pretty good</td>
<td>Less feasible, a little revision</td>
</tr>
<tr>
<td>4</td>
<td>20%-40%</td>
<td>Not good</td>
<td>Not worth it, need revision</td>
</tr>
<tr>
<td>5</td>
<td>0-20%</td>
<td>Very less</td>
<td>Very unworthy, needs to be revised again</td>
</tr>
</tbody>
</table>

### 3 Result and Discussion

Hybrid or online learning is a significant challenge for students in studying the topic of Waves and Optics. Existing textbooks are still reading materials that do not involve student activities, plus their use in English has reduced students' interest in studying during the pandemic. Thus, it is necessary to have an Indonesian language learning module that is easy to access and learn so that students can easily learn even though learning is carried out online.

Flipbook contains E-Modules made using HTML, javascript, and CSS. The flipbook that was developed is based on a website with special settings that have been set by default by the researchers so that when users open the website via a PC/laptop device or use a cellphone, users will get almost the same experience. The website interface is also made as easy as possible for users to use.

In simple terms, users will only need to open a browser from their cellphone or PC/laptop then type in the URL then press enter. Currently, the research team has uploaded to the hosting. After the website is opened, the user will be faced with the cover of the E-Modul and the top of the cover will have flipbook navigation. With the navigation, users can do many things according to the availability of navigation options. The website-based flipbook e-module has the domain name https://modulsainsomega.com/gelop/.
In this development research, the resulting product is a digital teaching material entitled "Waves and Optics: Science Education Teaching Module". The start page of the e-module flipbook website is shown in Figure 2.

Fig. 2. Flipbook e-module website home page.

The main page of the website-based optical and waveform e-module is shown in Figure 3 while the table of contents and contents page is shown in the sample in Figure 4. Figure 5 shows an example of a sample flipbook e-module content.

Fig. 3. The wave and optics page of the flipbook e-module website.

Fig. 4. Contents page and Chapter 1 website-based flipbook e-module.
The website-based flipbook e-module is also equipped with navigation buttons. It is located at the top of the e-module. The navigation provided aims to make it easier for users to use. Figure 6 shows the website-based flipbook e-module navigation buttons. While Table 4 shows the button description from Figure 6.

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Return to the front page.</td>
</tr>
<tr>
<td>2</td>
<td>Return to the previous 1 page.</td>
</tr>
<tr>
<td>3</td>
<td>Go to the next 1 page.</td>
</tr>
<tr>
<td>4</td>
<td>Go to the last page.</td>
</tr>
<tr>
<td>5</td>
<td>Enlarge e-module.</td>
</tr>
<tr>
<td>6</td>
<td>Zoom out e-module.</td>
</tr>
<tr>
<td>7</td>
<td>Turn on autoplay so that the page will move automatically, to pause, the pointer is placed in the e-module area.</td>
</tr>
<tr>
<td>8</td>
<td>Turn paper sound on or off.</td>
</tr>
<tr>
<td>9</td>
<td>Display in fullscreen.</td>
</tr>
<tr>
<td>10</td>
<td>Display thumbnails.</td>
</tr>
</tbody>
</table>

Website-based E-module validation is carried out to media experts, material experts, and learning experts. The trial of the website-based flipbook e-module was conducted on 56 students of the Natural Sciences Study Program, Universitas Negeri Malang. The results of the validation by media experts are as shown in Table 5. The results of the validation of material experts are shown in Table 6. While the validation of learning experts is as shown in Table 7.
Table 5. Validation results by media experts.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Indicators</th>
<th>Number of sub-indicators</th>
<th>Average Validation score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media Expert</td>
<td>Media Display</td>
<td>5</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td>Media in Learning</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Student involvement in the use of media</td>
<td>3</td>
<td>4.3</td>
</tr>
</tbody>
</table>

Based on Table 5, it can be concluded that the average acquisition of media experts validation is 4.1 or 82%. So it can be concluded that the website-based flipbook e-module is included in the Good category with a statement revised as necessary.

Table 6. Validation results by material experts.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Indicators</th>
<th>Number of sub-indicators</th>
<th>Validation score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Expert</td>
<td>Fit for Purpose</td>
<td>4</td>
<td>4.75</td>
</tr>
<tr>
<td></td>
<td>Curriculum</td>
<td>3</td>
<td>4.67</td>
</tr>
<tr>
<td></td>
<td>Contents</td>
<td>2</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>Interaction</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

Based on Table 6, it can be concluded that the average acquisition of material experts validation is 4.6 or 92%. So it can be concluded that the website-based flipbook e-module is included in the Very Good category with a statement that no revision is needed.

Table 7. Validation results by learning experts.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Indicators</th>
<th>Number of sub-indicators</th>
<th>Validation score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Expert</td>
<td>Media Display</td>
<td>3</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td>Presentation of Material in the media</td>
<td>2</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>Interest in learning media</td>
<td>4</td>
<td>4.75</td>
</tr>
<tr>
<td></td>
<td>Student engagement</td>
<td>3</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>Feedback</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

Based on Table 7, it can be concluded that the average acquisition of material experts is 4.53 or 90.78%. So it can be concluded that the website-based flipbook e-module is included in the Very Good category with a statement that no revision is needed. Table 8 shows some suggestions from the three experts and improvements that have been made by researchers.

Table 8. Some advice from the experts

<table>
<thead>
<tr>
<th>No.</th>
<th>Advice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paper sound effect feature sometimes works, sometimes it doesn't. Please fix it to add to the atmosphere like opening a real book.</td>
</tr>
</tbody>
</table>
There are enough questions that describe the application of image formation on mirrors and lenses in everyday life as stated in the CPMK. Problems can be related to everyday life, for example, the application of a convex mirror to the rearview mirror of a car, and how the formation of its image can be applied.

Slightly improved navigation size to be enlarged to make it easier to access the buttons provided.

The e-module flipbook trial was conducted on 56 students. The online implementation with technical students tries first the website-based flipbook e-module that can be accessed using a computer or mobile phone. After trying for a while, the students filled out a questionnaire. The results of filling out questionnaires by students can be seen in Table 9.

<table>
<thead>
<tr>
<th>Subject Response</th>
<th>Indicators</th>
<th>Number of sub-indicators</th>
<th>Average score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media interest</td>
<td>1</td>
<td>4,125</td>
<td></td>
</tr>
<tr>
<td>Media operation</td>
<td>1</td>
<td>4,035</td>
<td></td>
</tr>
<tr>
<td>Media benefits</td>
<td>2</td>
<td>4,053</td>
<td></td>
</tr>
<tr>
<td>Enthusiastic use of media</td>
<td>1</td>
<td>4,178</td>
<td></td>
</tr>
</tbody>
</table>
Acknowledgments

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References


The Development of Laboratory-Scaled Mini Roller Coaster Media for Non-Conservative Energy Observations

Rifa’atul Maulidah\textsuperscript{1}, Ifa Rifatul Mahmudah\textsuperscript{2}, Dwi Sulistyaningsih\textsuperscript{3}
{rifaatulm@unsil.ac.id}

Departement of Physics Education, University of Siliwangi\textsuperscript{123}

Abstract. Analysis accurately for observing the non-conservative forces on the object’s motion can contribute to a deeper understanding of Conservative Laws. A study to design the laboratory-based media was implemented using research and development methods to produce an experimental device that can observe the changes in mechanical energy (same as non-conservative energy). The method chosen is 4D which consists of defining, designing, developing, and disseminating. In this study, the discussion is limited to the stage of developing for self-evaluation data. The results for defining are the analysing data of students needs, for the designing are the calculation of the rail track’s size and shape, and for the development are the mini roller coaster device. Utilize the video-based laboratory, the media can be used for analysing the change of vertical acceleration and height with time and the changes of mechanical energy that can show the existence of the non-conservative energy.

Keywords: media development, mini roller coaster, non-conservative energy.

1 Introduction

The discussion of the energy concept of objects moving in a trajectory has always been a concern, especially when studying the dynamics of object motion. Both because of the many related concepts that we can learn based on a case of motion or the difficulty of these concepts to understand. We often encounter various physical phenomena such as motion, force, and energy changes in real life. However, not all of these concepts can be observed or imagined by students directly. For example, we must imagine the law of energy conservation concepts in an object moving abstractly.

Students’ submission of physical concepts abstractly is almost a common thing done by teachers/lecturers. It is not wrong, but the problem is that not all students have the same imagination ability, so absorbing abstract information will not be the same. The result is the failure experienced by some students in understanding concepts. The bad thing that might happen is misconceptions. The solution to reducing the occurrence of conceptual errors due to the inability of students to imagine abstractly is with the help of learning media. Such as teaching aids, experimental tools, or practical tools [1].

Learning Media

The curriculum, lectures, and the learning and teaching process influence education’s success, including learning media. Every learning activity requires strategies, methods, and learning media [2] that positively affect students. The learning media in question must convey or distribute messages from a planned source so that there is a learning environment and the recipients carry out the learning process [3]. Choosing and developing learning media proposed by Marpanaji must pay attention to whether teachers implement and develop learning media during the learning process? Do teachers choose the media according to the needs analysis? [4].
The Non-Conservative Energy

The law of conservation of energy in this study has limitations within the scope of physics which explains the conservation of mechanical energy. It is said that the total energy of an isolated system is constant. But in fact, non-conservative forces such as friction are difficult to ignore [5]. For example, in a marble moving on a rail, contact between the marble and the trajectory creates a frictional force. It means that a non-conservative force in the system can cause the mechanical energy to change over time.

In the work-energy theorem, the forces that change objects' kinetic energy \( (E_K) \) are both conservative and non-conservative forces [6]. The equation of net force acting on the object is \( F_t = F_k + F_{nk} \). An example of a conservative force \( F_k \) is the gravitational force, while an example of a non-conservative force \( F_{nk} \) is a frictional force. Using the work-potential energy theorem \( W_k = -\Delta U \), the total work done by the combined forces on an object is:

\[
W_t = W_k + W_{nk} \\
= \int F_k \cdot ds + \int F_{nk} \cdot ds \\
= -\Delta U + W_{nk}
\]

Based on the work-kinetic energy theorem, the total work done by conservative and non-conservative forces on the system is equal to the change in the kinetic energy of the system \( W_t = \Delta E_K \), so Equation (2) can be rewritten as:

\[
-\Delta U + W_{nk} = \Delta E_K \\
W_{nk} = \Delta E_K + \Delta U \\
W_{nk} = \Delta E_M
\]

Equation (3) shows that the work done by the non-conservative force equals the change of mechanical energy [7]. When air friction is neglected, gravity is the only force acting on the object. In that condition, the work done by the non-conservative forces is zero \( (W_{nk} = 0) \). The change in mechanical energy can be written as:

\[
0 = \Delta E_M \\
\Delta E_K + \Delta U = 0 \\
(E_{Kf} - E_{Ki}) + (U_f - U_i) = 0 \\
E_{ke} + U_i = E_{ke} + U_f
\]

If a system is isolated and the forces are only conservative, there is no change in mechanical energy \( (\Delta E_M = 0) \). It is known as the law of conservation of mechanical energy [8]. No change in the value of mechanical energy does not mean the value of mechanical energy is zero, but the mechanical energy is constant at every point.

The Laboratory-Scaled Mini Roller Coaster

The mini roller coaster that will be researched is a prototype designed to resemble the trajectory of a roller coaster game. A roller coaster is a train driven at a certain high speed to cross a particular rail line [9]. The roller coaster train will slide, dip, and spin very fast by utilizing mechanical energy and the force of gravity [10].

A rail is placed at a certain height supported by steel and twisted in such away. Physical phenomena observed from the roller coaster system include potential energy, kinetic energy, conservation of energy, dynamics, gravitational force, and centripetal force. The mini roller coaster device is a miniature that will be used to analyse several physical phenomena and will be operated on a physics laboratory scale.
Video Based Laboratory: Tracker Video Analysis

In analysing physical phenomena related to motion, not all of the quantities can be obtained or analysed easily. For example, in observing the free-fall motion of a ball, the data on the ball’s position against time is difficult to obtain accurately with just a length and time measuring instruments. Device that can help precisely analyse objects’ motion, is tracker video analysis software.

Tracker video analysis is used to analyse and create a two-dimensional motion modelling of the observed object [11]. The selected video tracker analysis is developed by Open Source Physics (OSP) with a Java framework [12]. The representation of the analysis and modelling of the motion is quantitative data and graphs. Its use can provide convenience for teachers and students in understanding kinematics concepts and sharpen physics problem-solving abilities [13]. Analysis of objects’ minimum height and velocity on a circular path can also be done using tracker tracking analysis software [14].

Anissofira et al. [15] analysed position versus time on the motion of a roller coaster on one of the rides using tracker software. A deeper analysis of the roller coaster motion experiment was also carried out by Putra et al. [14], but the roller coaster observed was a simple roller coaster designed by himself. The position data against the roller coaster time analysed by the tracker software is processed using the law of conservation of energy and Newton’s laws of motion to determine the minimum height and speed of the roller coaster object when it passes through a track. The use of tracker software in other experiments has also been used to analyse Newton’s pendulum swing motion [15], rotational motion of fidget spinner toys [16], and parabolic motion analysis [12].

2 Research Methods

This study uses research and development methods to observe the non-conservative energy from the non-conservative forces acting on an object moving in a trajectory. A laboratory-scale device was developed with a 4D model consisting of four main stages to achieve the research objectives: define, design, develop, and disseminate [17]. This study limits the development stage to self-evaluation activities to obtain a non-conservative energy analysis of the created media.

Define

The definition stage in laboratory-scale learning media development is carried out to determine and define the needs during the process. The instruments in the form of checklists, interviews, and questionnaires were prepared to obtain curriculum data analysis, learning objectives, and analysis of student needs. The results from the definition stage are used as a reference in media design.

Design

The designing stage aims to produce a precise rail track design before the media is assembled according to the tools and materials used. The mini roller coaster track will be composed of three-track pieces: a polynomial track, a linear track, and a clothoid track. Each track form is arranged in an integrated manner to form a track resembling a roller coaster ride.

Develop

The development stage to self-evaluation activities is carried out so that researchers can self-assess the devices that have been made and test the suitability of the learning media with the applicable media development rules. The resulting device is also tested for its ability to analyse the non-conservative energy due to the non-conservative forces acting on objects moving in a roller-coaster trajectory by observing using a video tracker analysis.
3 Result and Discussion

This section presents the research results, which develops a mini roller coaster device that can be used to analyse the law of conservation of energy with tracker video analysis for introductory physics lectures. It discusses the results of each stage of development attained to obtain media products and non-conservative data analyses.

Analysing Data of Students Needs

The analysis was carried out by reviewing the curriculum documents of the Physics Education Department so that the media developed was following the curriculum needs. The document being studied is the Plan of Learning of Basic Physics I course. Interviews were also conducted with the lecturers of the course. The results of the analysis data are given in Table 1.

<table>
<thead>
<tr>
<th>Analysed Aspect</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Outcome (LO)</td>
<td>The sub-CLOs in The Lesson Plan of Basic Physics: “The students are able to identify the concept and application of work and energy comprehensively” The LO for KU1: apply logical, critical, systematic, and innovative thinking in the context of the development or implementation of science and technology that pays attention to and applies humanities values that are appropriate in the field of physics. The LO for PA1: mastering the theoretical concepts of classical and modern physics in general.</td>
</tr>
<tr>
<td>The uses of Learning Media in Laboratory Experiment for LO</td>
<td>In achieving the LO assigned on sub-CLOs, the material is taught through a virtual laboratory with online simulations by lecture and practical methods.</td>
</tr>
</tbody>
</table>

Based on the LO assigned to sub-CLOs, our findings from this analysis are the student learning achievement must be supported by contextual learning methods. The simulation is good in helping students' understanding. They can verify concepts but cannot practice analytical skills. In addition, students are less able to explore more varied cases related to the phenomenon of the law of conservation of energy, if only from online simulations.

We analysed the questionnaire through seven questions to obtain data on student needs, as shown in Table 2.

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you studied the law of conservation of energy?</td>
<td>100% of students answered yes. They have studied it in the Basic Physics course I</td>
</tr>
<tr>
<td>Is the law of conservation of energy easy to understand?</td>
<td>92% of students answered it easy. However, this ease of understanding must be supported by appropriate learning methods.</td>
</tr>
<tr>
<td>Have you conducted an experiments on the law of conservation of energy?</td>
<td>100% of students answered yes. They conduct an experiment using online simulations.</td>
</tr>
</tbody>
</table>
Do you understand the concept of the law of conservation of energy through these activities? 96% of students answered yes. Taking data through online simulations is easy to understand because students only observe the results without processing the data. However, in terms of scientific skills, it has many lacks.

Is an experiment on the law of conservation of energy in a laboratory still needed? 88% of students answered yes. An experiment in a laboratory is still needed to complete the limitations of online simulation.

Is an experiment can confirm the students’ understanding of the concept of work and energy? 100% of students answered yes.

What experimental media do you expect to use in learning? Students answer the expected experimental media is a laboratory-based device that is assisted by technological advances.

The needs analysis become our reference at the design and development stage to develop media with the following criteria: (1) able to provide contextual learning experiences to students, (2) has a flexible design (trajectory can be modified as needed), and (3) integrating technological advances for the data analysis during experiments.

The Rail Track’s Design

The rail tracks are designed with precise calculations related to the width, height, and length of the track and the shape of the trajectory. The details of the design consist of three paths: the first is a polynomial path, the second is a linear path, and the third is a clothoid path. Objects that move in a trajectory are not operated by machines, but utilize the force and potential of the earth’s gravity. An object that is initially at rest must have maximum potential energy ($E_P$) at point A, maximum kinetic energy ($E_K$) at point B, and addition of $E_P$ and $E_K$ (equal to mechanical energy ($E_M$)) at point C, as shown in Figure 1.

The equation of the first path of trajectory is expressed as:

$$f(x) = ax^2 + bx + c$$

(6)

where $y = f(x)$. In Figure 1, it can be explained that $x_A = 0$ as the starting point, $y_A = \text{max}$, $y_B = \text{min}$, dan $y_C \leq \frac{1}{2} y_A$. The value of $y_C \neq y_A$ so the object has $E_P$ and $E_K$ simultaneously and moves to the second path of trajectory.

**Fig 1.** The 1st trajectory path

The shape of the second trajectory is a graph of a linear function. The $E_M$ of the object at position C, as shown in Figure 2, is the sum of $E_P$ and $E_K$. This trajectory is designed to accelerate the object so that the object has a maximum speed at D.
The shape of the third trajectory path is clothoid. The trajectory has the advantage that its radius of curvature gradually decreases from the bottom, as shown in Figure 3. With the clothoid shaped trajectory, it allows objects to use less energy to travel a loop [10].

After the trajectory is designed, the mini roller coaster device is assembled and produced. The media has a dimensions of 120 x 40 x 20 cm, as shown in Figure 4.

**Analysing The Non-Conservative Energy from Mini Roller Coaster Device**

With video-tracking analysis, data retrieval was carried out with five repetitions. The data are interpreted to graph the function $y$ to $t$ and the function $a_y$ to $t$, which shows the change in the height of the object and the change in the vertical velocity of the object each time, respectively. In Figure 5, it can be seen that there is a change in the acceleration of the object every time at each position of the object's motion.
There is always a non-conservative force on the object, which causes the $E_M$ to be not constant along the path. The total work done by all conservative and non-conservative forces on the system is equal to $E_K$, mathematically explained in equation (1). From equation (2), we know that the work done by the non-conservative force is equal to $\Delta E_M$. Energy change data for each position on the developed media can be seen in Table 3.

Although observing the existence of this non-conservative force is not easy, with the help of a mini roller coaster with video tracker analysis, we can calculate it and interpret the data from Table 3 into the graph of Figure 6.

We can observe that the $E_M$ of an object varies with each position. It shows that there is work in the form of non-conservative energy acting on objects moving along the mini roller-coaster trajectory.
4 Conclusion

The findings of this study have shown that the development of a laboratory-scaled mini roller coaster media for observing the non-conservative energy with video tracker analysis can be attained through the stages of define, design, and development to the self-evaluation activities. The media can be utilised to analyse the change of vertical acceleration and height with time and the changes of mechanical energy that show the non-conservative energy existences.

Acknowledgement

The authors wish to thank the head of the Basic Physics Laboratory of University of Siliwangi for the support and encouragement to this research. This project was supported by the fund DIPA Ministry of Research, Technology and Higher Education, University of Siliwangi, Number SP DIPA-023.17.2.77504, 23 November 2020.

References


Promoting Comprehensive E-Learning For Higher Education Through The Comprehensive Use Of Moodle-Based Learning Management System

Yessi Affriyenni¹, Galandaru Swalaganata², Erti Hamimi³, Isnani Juki Fitriyah⁴

{yessi.fmipa@um.ac.id}

Science Education Study Program, Universitas Negeri Malang¹
Information System Study Program, Universitas Merdeka Malang²
Science Education Study Program, Universitas Negeri Malang³
Science Education Study Program, Universitas Negeri Malang⁴

Abstract. The rapid change of policy regarding the pandemic required various academic parties to make a rapid decision in response. Various learning design was proposed in the hope to facilitate an effective learning environment for students including the choice to use a specific Learning Management System (LMS). One of the most popular LMS used in this period is Moodle-based LMS. This study aims to investigate the use of Moodle-based LMS for higher education that was arranged comprehensively to support digital learning. Started from the learning environment arrangement in the LMS that was designed such that to facilitate students to learn comprehensively including the development of necessary media. The effectiveness of such design was investigated to promote comprehensive e-learning for higher education through data collection qualitative and quantitatively. The data shows that a well-arranged LMS could promote a better learning environment which gave a better impact on student's achievement.

Keywords: e-Learning, Higher Education, Moodle, Learning Management System.

1 Introduction

Covid-19 crisis has changed the education and learning paradigm in Indonesia. The pandemic has impacted every sector in human life ever since its spreading in 2019. Education is included as one of the affected sectors [1], [2]. Various countries have decided to conduct online learning including Indonesia. Currently, the Indonesian government has conducted the learning process through limited face-to-face meetings [3]. Commonly, it is conducted using the hybrid learning method by considering the health procedures [4], [5]. Through the policies of social distancing and physical distancing, interactions are limited [6], [7]. Hence, teachers as learning designers should design learning activities that optimize non-physical interaction but the learning process is still optimal.

One adaptive learning method in such a situation is online learning since it could be conducted remotely involving either the teachers or the students. Online learning is one of the learning methods conducted using information technology as the main tools in the middle of the pandemic [8]–[11]. The effectiveness of such a learning method relies mainly on the availability of supporting telecommunication networks along with the teacher’s capability and skill in designing learning activities [12]. In online learning, students are given the freedom to determine the time and the place to study. Students could interact with the teacher using various
applications including learning management systems, web conference platforms, and assessment applications [13], [14].

Currently, we have come to a digital era where information technology and science have been developed massively. It also gives an impact on the education sector, especially regarding learning media. In a learning activity, media could be defined as any form of communication instrument including software and hardware that is needed to be developed based on the necessity. It should be developed, used, and managed based on learning requirements to conduct an effective and efficient learning environment. Comprehensively, media is not only an assisting tool but is more like a connector to deliver messages between the educator and the students [15]–[18].

Currently, the popular way to convey messages, knowledge, and information in a learning environment is by using e-learning. E-learning is a term that could be defined as a learning system that uses the electronic instrument as the learning media. Furthermore, e-learning is not only expected to be powerful in replacing conventional learning but also enhanced with a relatively new method and strategy in the learning process. With the use of e-learning, it is expected that students interaction activity could be improved hence effective in enhancing the quality of graduates and the capacity of education institutions. Students are expected to form a learning community that interacts and shares information so there are multiple information sources [19]–[22].

Unfortunately, there are some constraints related to the use of online learning. Internet access interruption has become a huge challenge in Indonesia since network development is not evenly distributed [23]. Hence, the implementation of online learning for students in rural areas is still challenging since the signal is unstable [24]. One solution expected to overcome the limitation of internet connection is by using a proper Learning Management System (LMS).

The quality of online learning is determined mainly by the model of the LMS used in the learning activity since e-learning is the delivery of content via all electronic media, including the internet, intranet, extranets, satellite broadcast, audio/videotape, interactive tv, and CD-ROM. LMS in ICT (Information and Communication Technology)-based learning activity is defined as an instrument of technology product feasible to be used in the learning activity, as a part of learning material as the content of learning activity, and assisting instrument to conduct effective and efficient learning.

There are various LMS commonly used in Indonesia including Moodle-based LMS that can be customized as needed; Quipper that aims to be the Distributors of Wisdom; Edmodo which is popular in Indonesia since it provides various language features hence easier to be understood; Schoology with the tagline „it all started in the classroom“ provides various experiences for the students who use the platform, and Geschool that uniquely provides blog so students could share personal experiences along with news from all over the world hence students can learn, share, and inspire each other [15], [25]–[28].

With the feature of Moodle-based LMS, it has become one of the most used platforms in higher education. Moodle is a free LMS that enables the user to create powerful, flexible, and engaging online learning experiences. It enables the student to browse several web pages in any order through embedding in the LMS, live chats feature is available to be used among students and teachers, forums that can be used to rate messages or discuss problems, online workshops that enable students to collaborate and evaluate each other’s work, impromptu polls that let the teacher assess and evaluate course’s progress, and directories to store files [29].

All of these Moodle’s features could create an active learning environment that promotes interactions among students and student-to-teacher interaction. These features are advantageous for Moodle-based learning compared to other LMS. Hence, this study aims to investigate the
effectiveness of the *Moodle*-based learning management system in promoting comprehensive e-learning for higher education and students’ responses towards e-learning.

2 Research Methods

Communication has played a crucial role in education, especially since the COVID-19 pandemic has started. However, in higher education, communication should focus on the transmission of information in both ways either in lecturer-to-student or student-to-student interaction. The use of communication media become more crucial. The choice of platforms should consider the analytical reasoning and judgment based on the actual situation. In higher education, the learning environment should be able to create interactive communication that promotes students’ problem-solving skills, communication skills, and creative thinking. Even in the pandemic, educators should be able to determine which applications could provide interactive features that allow students to gain more information with immediate feedback that could be given by their peers or lecturers. Hence, one of the most popular platforms commonly used currently in higher education especially in Indonesia is the *Moodle*-based platform.

*Moodle*-based LMS facilitates students with a discussion forum that aims to remove communication barriers by providing a user-friendly interface. The interaction without involving face-to-face encounters allows students to express their argumentations and opinions more openly. Moreover, the discussion forum can also be used without time limitation so it can be used either synchronously or asynchronously. Hence, students have time flexibility whenever they want to respond or state their opinions when ideas come up to their minds. Moreover, for synchronous purposes, educators could facilitate live discussion using the *Chat* feature where educators could come up with problems and students could use the feature to discuss together synchronously using the real-time chat at the same time.

If necessary, *Moodle*-based LMS could also be enhanced using another real-time feature called web meetings. Currently, in our institution account, we are facilitated with the *Big Blue Button* feature but not necessarily limited to the application. We could also embed other web meeting applications to the LMS. The web meeting could be used anytime if content reinforcement is highly necessary since it requires more resources for students to access the application. For assessment purposes, *Moodle*-based LMS provides various kinds of questions such as multiple-choice, true/false, matching, short answers, even essays. These facilities could be used based on the purpose of the assessment designed to be conducted. However, we could also embed links to other assessment platforms so the assessment tools are not limited to the ones provided by the standard *Moodle* platform.

*Moodle*-based LMS could also be used as storage of resources including e-books, video, audio, or applications. This study explores all the facilities provided by the *Moodle*-based LMS including the discussion forum, resources storage, assignment, and quiz. All these features are also enhanced by the development of an e-module flipbook linked to an external website where students could read the outlines of wave and optics courses. Students are also expected to install an *Android* application that supports the formative assessment provided at the end of every chapter which is enhanced with the use of *Augmented Reality* (AR) experience.

By the facilitation of *Moodle*-based features as mentioned in the course of concern, this study aims to explore the effectiveness of *Moodle*-based LMS and students’ responses towards such a learning environment. It involved control and experimental groups consisting of 31 students in each group enrolled in Wave and Optics course. Both were treated using the problem-solving
approach in LMS. The control group was facilitated using the standard Moodle-based LMS while the experimental group was treated using similar features enhanced with the use of flipbook and AR-based Android application developed previously by the research team. Test and 4-scaled questionnaires were used as the source of quantitative data. Previously, the test questions' validity and reliability had been tested. 20 HOTS questions were covering the Wave and Optics topic and 11 items of the questionnaire covered various aspects of the LMS and learning activities conducted.

3 Results and Discussions

The Moodle-based LMS for the course conducted in the pandemic era begins with the explanation of how the course will be conducted, the resources available, and the lesson plan as shown in Fig. 1. For the experimental group, students are given a flipbook-based e-module and an application to be used together. Next to each meeting, students conduct online learning as the design is shown in Fig. 2.

![Fig. 1.](image1.png) ![Fig. 2.](image2.png)

(a) (b)

**Fig. 1.** The learning design at the start of the LMS course is (a) the flow design of the course along with the applications for the experimental group, and (b) the lesson plan and learning resources for both groups.

However, the experimental group was also treated with the use of an e-module flipbook as shown in Fig. 3. It facilitates students with learning material, conceptual questions, formative assessment, and instruction related to the discussion activity in the LMS. Hence, the activity in the experimental groups was more comprehensive compared to the control group.

**Fig. 2.** General description of students' activities in each meeting.
Fig. 3. Sample of e-module flipbook for experimental group activity.

To investigate the effectiveness of Moodle-based LMS, a statistical test was conducted including normality and homogeneity test. The normality test shows that both groups are normally distributed and homogenous. A pretest and a post-test were conducted for both of the groups to identify the different results related to the facilitation of the e-module flipbook and application in the LMS.

<table>
<thead>
<tr>
<th>Category</th>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>57.43</td>
<td>60.23</td>
</tr>
<tr>
<td>Posttest</td>
<td>72.37</td>
<td>74.57</td>
</tr>
</tbody>
</table>

Based on Table 1, the mean scores of both the groups in the pre-test and post-test were quite similar. The post-test score for the experimental group is slightly larger than the control group. Moreover, a questionnaire was given to the students to find out their opinion and perspectives related to the use of Moodle-based LMS.

All of the students agreed that their skill in using ICT helps them to be able to learn in the LMS and the lecturer’s IT proficiency enabled them to follow the learning flow easily. 90.5% of students agreed that the use of Moodle-based LMS in pandemic era helps the learning process to become more effective since it is very comprehensive and integrative. Most of the students (90.4%) in the experimental group agreed that the use of other applications linked in the LMS enrich their learning experience. Comprehensive learning using Moodle-based LMS enables students to interact more in discussion related to the problem-solving approach and boost students’ self-confidence. Hence, the comprehensive learning activities using Moodle-based LMS succeeded in improving students’ conceptual understanding, especially in the pandemic era.

4 Conclusions

Based on the conducted study, it could be concluded that Moodle-based LMS could effectively promote comprehensive e-learning activity for higher education especially when it is connected to other supportive applications since it is one of the advantages of Moodle-based
LMS being capable to be collaborated with other platforms or application either by embedding or hyperlinking. Moreover, students’ responses towards the use of Moodle-based LMS were very positive since it can boost their self-confidence in interacting with one another. Students could also improve their conceptual understanding of the course since Moodle-based LMS enriches their learning experience.

Acknowledgment
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References
[29] W. Rice and H. William, Moodle. Packt publishing Birming
The Effect of Content Mastering Services by Learning Cell Techniques to Improve Students' Interpersonal Relations at Percut Sei Tuan Junior High School

Nani Barorah Nasution1, Erwita Ika Violina2, Elisabeth Tambunan3
{nani.barorah@gmail.com1, erwitaika@unimed.ac.id2, elisabethtambunan11@gmail.com3}

Faculty of Education, Medan State University, Indonesia

Abstract. This study aims to establish the effect of content mastery services on cell learning techniques on improving interpersonal relationships of seventh grade students at SMP Negeri 2 Percut Sei Tuan. This is an experimental research (Quasy Experiment Design). Sample was 10 people who were taken by purposive sampling technique. Hypothesis testing is used with the Wilcoxon test, and the results of the analysis in this study are the value of $J_{count} = 10.5$ with $w = 0.05$ and $n = 10$ so that the value of $J_{table}$ is 8. From the data it is known that $10.5 > 8$. The average score of pretest is 48.2 and the posttest score is 74.9. Data analysis found there was an increase in interpersonal relationships among students after being given services by 36%. The conclusion is content mastering services by learning cell techniques have a significant effect for improving student’s interpersonal relations.

Keywords: Interpersonal Relations, Content Mastery, Learning Cell

1 Introduction

Life skills refer to the ability people have to adapt and behave positively in a wide variety of environments, such as at school, at home, and in their neighborhood. There are several divisions of skills put forward by several experts but in this study, the authors quote based on the world health organization (WHO). Examples of life skills include leadership, interpersonal communication. Leadership, interpersonal communication, problem-solving and decision-making, and teamwork are examples of life skills. To be properly termed life skills, life skills must be transferrable across life domains (e.g., academics, home life, and relationships) (Pierce, Gould, & Camire, 2017). In this regard, educational and government agencies should emphasized the importance of transferable life skills for the the mental health of teenagers.

Life-skills education, according to the World Health Organization (1999) is a foundation to improve emotional and social development to prevent health and social problems. They suggested nine fundamental life skills: (1) effective communication (2) problem solving, (3) pressure resistance (4) stress management, (5) assertiveness, (6) critival thinking skills (7) social adjustment, (8) decision making and (9) interpersonal skills. Life skills, as defined by the United Nations, are a broad range of psychosocial and interpersonal abilities that can aid people in making informed decisions, development of coping and self-management skills that can lead to a healthy and productive life.

According to research, rejection from mothers, fathers, teachers, and peers all lead to depressed symptoms in adolescents (Zhao et al., 2020). Positive interpersonal ties, on the other
hand, may help teenagers avoid developing depressed symptoms. Positive interpersonal interactions can also serve as a resource for adolescents to cope with or overcome problems, reducing the likelihood of getting "stuck in the mud" of negative emotions, according to the interpersonal theory (Frank and Spanier, 1995).

Interpersonal interactions are likely to influence students' perceptions of social support in one of two ways: (a) by giving a variety of resources (e.g., trust and security) and (b) by influencing cognition, emotions, and actions without outwardly aiming to help (Cohen et al., 2000). Positive variables for preventing or decreasing depressive symptoms have recently piqued researchers' interest even more than risk factors for depressed symptoms (Lee et al., 2021).

Based on the results of initial observations by researchers in one secondary school in Medan foundsstudents' interpersonal relationships in online schools have drastically changed students' daily habits. Previously, the interaction process is carried out directly however due to the regulation of online school impact on establishing interpersonal relationships between peers. Thus foundsome children have personal communication media to interact freely with friends and teachers which has an impact on poor interpersonal relationships.

Therefore, schools especially guidance and counseling teachers need to assist students in improving students' interpersonal relationships at school through content mastery services. The current study looks at various strategies that could help researchers connect the dots between research on interpersonal interactions and research on academic engagement. It specifically looks at how students' perceptions of interpersonal relationships are linked to adaptive goals and academic engagement, as well as cell learning strategies. A learning cell is a small group of students, instructors, and facilitators who work together to achieve a common goal. Each learning cell in the class is made up of three to four students with similar interests who share ideas and collaborate to generate learning materials.

2 Review of Literature

Life Skill

Interpersonal relationships can be established due to the interaction actions or words. Humans need to build good social relations with each other with high-quality interpersonal relationships, and the sense of relatedness that they cultivate supports positive outcomes in several ways (Collie et al., 2016). However, some problems might arise in interpersonal relationships, especially this past year, the situation in our country and even the whole world is experiencing a COVID-19 pandemic. This pandemic has had a tremendous impact both on the world economy, human work but also has a profound impact on children's education. As a result, the government-issued policies and orders impact all activities or habits that were always carried out in schools now be carried out in their respective homes.

Individuals' patterns of emotion, cognition, and action when interacting with others can be conceived of as interpersonal connections (Plutchik, 1997). Indeed, there are some crucial elements of interpersonal interactions (e.g., relationships between teachers and students) and the quality of adolescent friendships may be a predictor of social adaptability by affecting their attitudes toward education(Zhang et al., 2021). Interpersonal relationships that are problematic are more likely to lead to depression) (Wille et al., 2014), especially during COVID-19 pandemics, interpersonal relationships can influence school adaptation either directly or indirectly by enhancing social support or resilience (parallel mediation) or by activating
resilience via the experience of social support (serial mediation). The findings of the previous study highlight the importance of interpersonal interactions, as well as the positive external and internal elements that influenced children’s school adaptability during the epidemic control phase. As a result, these findings may have consequences for college students’ mental health education in the post-epidemic age (Zhang et al., 2021).

Interpersonal relationships can improve with simultaneous interactions with others. Within the learning cell technique, students force to actively communicate in the comfort learning process in class (Darmawan, et al, 2019:162). Comfort comes from good interpersonal relationships, through action or communication with each other. These interactions are included in interpersonal relationships where individuals can establish good relationships which will create a comfortable learning atmosphere in the classroom.

By applying the cell learning technique, it will be easier to improve interpersonal relationships. In the school setting, teachers might develop teamwork in the classroom, by activated group projects and collaborative exercises. This method encourage students enhance their interpersonal skills. Supporting interpersonal relationships is also an important task that needs to intervene by guidance counseling teachers. Therefore in this research, we focused on how the teacher of guidance and counseling create a program that promotes the interpersonal relationship. One of a program for developing interpersonal relationships is content services (program). According to Prayitno content program is an assistance service to individuals (alone or in groups), in this research we combined this program with a special technique called the learning cell technique. The learning cell technique aims to involve students actively in thinking about the content of the material then encourage students to raise questions that provoke interesting thinking and teach students to know their understanding (Song, 2019) that will impact their ability on improving their interpersonal relationships.

3 Research Methods

This study used a quasi-experimental method (quasi-experimental) with pretest-posttest control group design. The subject was collected using a purposive sampling technique. (Sugiyono, 2005:80). The subjects used in this study were 96 students at SMP Negeri 2 Percut Sei Tuan who were identified as having interpersonal relationships in the low-medium category. Subjects were taken using purposive sampling with the following steps: (a) researchers distributed instruments of interpersonal relations (b) analyzed students who had low or moderate interpersonal relationships. Based on the analyzed processes ten students are used as experimental subjects.

The quality of interpersonal relationships was measured by the Interpersonal Relation aspects within This 23-item measure is composed of four subscales: interpersonal communication, relation style, relationship climate and, friendly interaction. Each item is responded to from 1 to 5 with a Likert-type scale.

4 Results and Discussion

At first, we conducted Wilcoxon to determine the effect of learning cell techniques with guidance and counseling setting on improving interpersonal relationships. Table 1. Revealed the test result for the number of levels with a positive sign are 44.5 and the test result for the
number of levels with a negative sign are 10.5. The value of \( J = 0.5 \) is greater than the critical value table \( J \) for the Wilcoxon marked level test where, \( N = 10, = 0.05 \), then \( J \) table = 8. Based on the Wilcoxon test results, the value \( J \) count > \( J \) table where \( 10.5 > 8 \), it can be concluded learning cell techniques with guidance and counseling setting improves interpersonal relationships.

According to the objectives of this study, we determined the effect of interpersonal relationships through the service process of mastering the content of cell learning techniques. Based on the statistical analysis found that the average score in the post-test is higher than the pretest which is 48.2 < 74.9. Therefore, it can be concluded that there is an increase in interpersonal relationships to be higher through the service process of mastering the content of cell learning techniques. The results of the comparison of pre-test and post-test scores overall changes in pre-test and post-test are in the following figures.

### Table 1. Interpersonal Relationship

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Pre-Test Score</th>
<th>Post-Test Score</th>
<th>XA-XB = D</th>
<th>D-MD = d</th>
<th>Level</th>
<th>Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM</td>
<td>43</td>
<td>72</td>
<td>29</td>
<td>2.3</td>
<td>8.5</td>
<td>8.5</td>
</tr>
<tr>
<td>SA</td>
<td>45</td>
<td>72</td>
<td>27</td>
<td>0.3</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>YP</td>
<td>45</td>
<td>73</td>
<td>28</td>
<td>1.3</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>AN</td>
<td>45</td>
<td>74</td>
<td>29</td>
<td>2.3</td>
<td>8.5</td>
<td>8.5</td>
</tr>
<tr>
<td>TS</td>
<td>46</td>
<td>75</td>
<td>29</td>
<td>2.3</td>
<td>8.5</td>
<td>8.5</td>
</tr>
<tr>
<td>MF</td>
<td>46</td>
<td>75</td>
<td>29</td>
<td>2.3</td>
<td>8.5</td>
<td>8.5</td>
</tr>
<tr>
<td>NA</td>
<td>53</td>
<td>75</td>
<td>22</td>
<td>-4.7</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>JF</td>
<td>53</td>
<td>75</td>
<td>22</td>
<td>-4.7</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TN</td>
<td>53</td>
<td>78</td>
<td>25</td>
<td>-1.7</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>ZA</td>
<td>53</td>
<td>80</td>
<td>27</td>
<td>0.3</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>428</strong></td>
<td><strong>749</strong></td>
<td><strong>267</strong></td>
<td><strong>J count Score</strong></td>
<td><strong>44.5</strong></td>
<td><strong>10.5</strong></td>
</tr>
</tbody>
</table>

According to the objectives of this study, we determined the effect of interpersonal relationships through the service process of mastering the content of cell learning techniques. Based on the statistical analysis found that the average score in the post-test is higher than the pretest which is 48.2 < 74.9. Therefore, it can be concluded that there is an increase in interpersonal relationships to be higher through the service process of mastering the content of cell learning techniques. The results of the comparison of pre-test and post-test scores overall changes in pre-test and post-test are in the following figures.

**Fig 1. Pretest Post-Test Analyses of Interpersonal Relationship**

Then in further analyses on Table 1 shows the four aspects of interpersonal relationships. It was revealed that relation style perceived the highest difference (83) score followed by friendly interaction. Overall, each indicator on interpersonal relationships demonstrated an increasing score from pretest to posttest.
5 Conclusion

This study was designed to assess the impact of learning cells on improving students' interpersonal relationships. The special advantage of this technique is students are actively encouraged to think independently also students interact with others students that will impact students' interpersonal relationships. Learning cell technique provides a chance for students to carry out discussions with their partners to be more active, more open, more confident, and more critical and work well together to find the right answers regarding the questions to be answered.

Learning cell technique also enhances relationship patterns more enthusiastic relationship atmosphere, after being given the service of mastering the content of learning cell techniques students begin to open up to their surroundings, over time interpersonal communication gets better. Students become more understanding of the conditions or circumstances of people around so they can build the atmosphere according to the circumstances, over time the spontaneous interactions that occurred between students became more friendly.

References


<table>
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<tr>
<th>Table 2. Prevalence of Each Indicator on Interpersonal Relationship Indicators</th>
<th>Pre-test Score</th>
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<tr>
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<td>Friendly Interaction</td>
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</table>
Program Keluarga Harapan as An Innovative Poverty Reduction Program on The Simardan Island, North Sumatera

Elizon Nainggolan¹, Fathia Ulfa², Rosdiana³, Mahfuzi Irwan³, Ibnu Hajar Damanik⁴
{elizonnaingg06@gmail.com}
Community Education, Universitas Negeri Medan

Abstract. This study aims to determine the effectiveness of the Program Keluarga Harapan (PKH) in alleviating poverty in Simardan Island, North Sumatera. The type of research used in this research is descriptive quantitative. The population in this study amounted to 400 PKH recipients and the sample used was 100 PKH recipients. The data collection technique used is a questionnaire. The results showed that firstly, the effectiveness of PKH in understanding the program was very effective, the effectiveness of PKH in targeting accuracy was classified as effective, the effectiveness of PKH on time was classified as less effective, the effectiveness of PKH in achieving the goal is classified as effective, and the effectiveness of PKH in real effective change is 61.33. So based on the results of this study, the results of the Program Keluarga Harapan (PKH) in poverty alleviation by calculating the average percentage rate of the effectiveness of the Program Keluarga Harapan (PKH) obtained 68.05% results. Thus, it can be concluded that the effectiveness of the Program Keluarga Harapan in alleviating poverty in Siamrdan Island North Sumatera is effective.

Keywords: Keluarga harapan, Innovative program, Poverty

1 Introduction

Indonesia is a country with the largest population, with a population of 268 million people and is divided into 34 provinces. The percentage of the number of poor people in Indonesia comes from data from the Central Statistics Agency (BPS) in March 2019 of 25.41 million people, (9.41%), decreased by 0.80 million people, (0.41%) [1]. Poverty is a problem that can have an impact on health and education. In the health sector, poverty can cause the health of the poor to be vulnerable to disease and the risk of malnutrition in pregnant women which has an impact on fetal development and live birth rates.

In the field of education, poverty has an impact on increasing the number of children dropping out of school from poor families, and can affect the degree of public health, namely susceptibility to disease and the risk of malnutrition in pregnant women, so that it will affect the health of the fetus[2]. To overcome the problem of poverty, the government will try as much as possible. The government issued a policy to empower poor families. One of the government programs that is expected to empower the poor is Program Keluarga Harapan (PKH).

PKH is a program that provides cash assistance to very poor families (RTSM). PKH given to RTSM has met the requirements set by the Ministry of Social Affairs of the Republic of Indonesia in accordance with the decision of the coordinating minister for People's Welfare as the head of the Poverty Reduction Coordination Team No: 31/KEP/MENKO/-KESRA/XI/2007.
Concerning “Program Keluarga Harapan Control Team”. Program Keluarga Harapan is through the provision of Conditional Cash Assistance (BTB) (known as Program Keluarga Harapan (PKH)) as one of the steps to realize a social protection system. Program Keluarga Harapan (PKH) is different from the previous cash transfer program and is not a continuation of the previous plan that helped maintain the purchasing power of poor households when the government adjusted fuel prices. The purpose of PKH is to establish a social protection system for the poor in order to improve the social welfare of the poor and break the chain of poverty that has emerged so far. PKH is a social assistance and protection program that has been included in the first group of Indonesia’s poverty reduction strategies. This program is a conditional cash transfer related to education and health.[8],[9].

In implementing Program Keluarga Harapan, each Very Poor Household (RSTM) will receive assistance every three months. This assistance will be used to send their children to school, including immunizations and nutritional checks for toddlers. Gynecological examination for pregnant women. In the short term, the form of assistance provided by PKH will reduce RSTM spending, but in the long term it is hoped that program assistance can break the intergenerational poverty chain. (Source: General Guidebook for Program Keluarga Harapan). Pulau Simardan Village is one of the villages located in the eastern Datuk Bandar sub-district, Tanjungbalai City. Most of the residents of this simardan island village work as fishermen, laborers and motorcycle taxi drivers. With this work, some people are still unable to meet their daily needs. As for some important needs such as education and health, the community reduces these needs for other necessities of life. Pulau Simardan Village has 6,360 families consisting of 12 neighborhoods. From the total population there are 763 families who are classified as poor / unable to meet their needs. Simardan Island Village is one of the villages that received PKH assistance. The recipients of Program Keluarga Harapan (PKH) in this sub-district totaled 400 families.

In the implementation of Program Keluarga Harapan (PKH) in Pulau Simardan Village and Tanjungbalai City. There are several problems that arise in Program Keluarga Harapan (PKH) so that it has not yet achieved the objectives of the program. The problems in Program Keluarga Harapan (PKH) include:

First, Understanding Program Keluarga Harapan (PKH) PKH recipients have begun to understand how the PKH program implementation system is and what they should do with the assistance, due to the socialization carried out by facilitators to guide PKH recipients, namely providing good service to PKH participants and provide solutions to complaints submitted by the public.

Second, right on target, there are still some residents who are classified as Very Poor Households (RTSM) who have not received assistance from Program Keluarga Harapan (PKH). The criteria or characteristics of Very Poor Households (RTSM) are as follows:

a. The floor area of a residential building is less than 8 m2 per person.
b. Home ownership : No house, ride or contract.
c. The type of floor of a residential building is only ground/plaster.
d. Types of walls of residential buildings made of bamboo/low quality wood/60% damaged walls.
e. Do not have defecation facilities/shared with other households (public toilets).
f. The source of drinking water is from wells/unprotected springs/rainwater rivers.
g. Home lighting sources do not use electricity/do not have their own meter/line.
h. The type of fuel for daily cooking is firewood/charcoal/kerosene.
i. Frequency of purchasing meat/chicken/milk once a week per family member.
j. The frequency of eating once/twice a day and does not meet the nutritional standards for each family member.
k. Buy only one new set of clothes a year for each family member.
l. Unable to go to the puskesmas/polyclinic for treatment, (medication costs and transportation costs, as well as waiting compensation).
m. Sources of income for the head of household are: farmers with land area <0.5 ha, farm laborers, fishermen, laborers, or other occupations with income below Rp. 600,000, - per month.

n. The highest education of the head of the household: no school/not completed elementary school/only elementary school.
o. Unable to send children to junior high school level (9 years of basic education). Do not have savings / goods that are easily sold with a minimum value of Rp. 500,000,- such as motorcycles, gold, livestock, or other capital goods.

To be categorized as a Very Poor Household (RTSM), a family only needs to meet 11 points out of the 16 points above. However, in reality there are still some RTSM that meet 11 points or more of these criteria but have not received PKH assistance. This means that the PKH program is not evenly distributed in Pulau Simardan Village because there are still some underprivileged communities in Pulau Simardan Village who should receive PKH assistance. Like Mrs. Ila, who lives in 9 Kelurahan Pulau Simardan which is classified as RTSM, she still has 1 child who is 4 years old and does not receive the assistance, she doesn't even know about PKH before (Source: Interview with PKH recipients).

Third, timely disbursement of PKH aid money. Basically, Program Keluarga Harapan (PKH) funds are disbursed every three months (ie January, April, July and October). But in fact, in the field there are often delays in the distribution of aid funds, and delays in disbursement of these funds can be delayed by about 2-3 weeks from the actual plan. Such as phase I disbursement carried out on January 7, 2020, phase II disbursement on April 10, phase III disbursement on July 15 2020, and phase IV disbursement on October 18 2020. This is what can confuse the (RTSM) who receive this assistance, especially when entering the new school year, because the expected money did not come out (Source: Interview with PKH recipients).

Fourth, the achievement of the goals in Program Keluarga Harapan (PKH) in this case the researcher sees that the PKH goals are less than optimal or the PKH goals are not being achieved as well as possible because 70% of PKH recipients misuse PKH assistance. The aid funds should have been used for education and health, but there are still PKH recipients who use the assistance for other purposes such as buying jewelry, electronic equipment and others. (Source: Interview with PKH recipients).

Fifth, real changes in Program Keluarga Harapan (PKH) some PKH recipients have used the assistance as well as possible for education and health purposes. However, from the observations of researchers in the aspect of real change, it has not run optimally (Source: Interview with PKH recipients).

Based on the above background, this study measures the effectiveness of PKH in poverty alleviation in Pulau Simardan Village, Tanjungbalai City more deeply. So that this research a will produce an in-depth picture of the effectiveness of PKH in Pulau Simardan Village, Tanjungbalai City.
2 Research Methods

The population in this study were 400 PKH recipients with 12 neighborhoods in Pulau Simardan Village (data obtained from PKH companion mothers) who became PKH recipients in Pulau Simardan Village, Tanjungbalai City.

The sample is part of the population that has the same characteristics as the population. There are 400 PKH recipients. From this population, 25% of the population is taken so that the number of samples is 25% x 400 = 100 people/mothers who receive PKH. Thus, in line with the opinion of Sugiyono (2013:62) "if the subject is less than 100, it is better to take all so that the research is a population study. But if the number of subjects is large (greater than 100), it can be taken between 10-15% or 20-25% or more.

The sampling technique used in this study was the researcher's sampling using the regional sampling technique (Area Sampling). This technique is used by researchers because the sample to be studied or the data source is in a large area, which includes all the environments in the Simardan Island Village, which amount to 12 neighborhoods. The reason for using this technique is because the population in this study is PKH recipients in the Simardan Island village which is divided into 12 neighborhoods. The data collection technique in this study used a questionnaire. Questionnaire is a data collection technique that is done by giving a set of questions or written statements to respondents to answer [3].

In this study, the instrument used was a questionnaire. All data is collected, then the data will then be analyzed. The data obtained from the questionnaire distributed to the respondents were analyzed using quantitative analysis techniques with the aim of answering the problem formulation. Responses from PKH recipients or respondents will be calculated using the formula P=F/n X 100%

Description :
P = Percentage of respondents' answers
F = Total respondent's answer score
n= The total number of respondents

This research was conducted in Pulau Simardan Village and Tanjungbalai City. This research was conducted from April to June 2021.

3 Result and Discussion

The results of the research carried out are the Effectiveness of Program Keluarga Harapan (PKH) in Poverty Alleviation in Pulau Simardan Village and Tanjungbalai City, the data obtained are described in accordance with the order of the questionnaire questions. Then it will be analyzed with frequency according to the answers that have been given by the respondents. The questionnaire used consists of 27 statements with 4 answer choices that have a predetermined value as follows: answer choice 1 is worth 4, option 2 is worth 3, choice 3 is worth 2 and option 1 is worth 1. From 100 respondents, it can be seen that the answers to the research questionnaire statements totaling 27 statements which are presented in the following tables:
Table 1.1 Effectiveness of Understanding the PKH Program

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<td>Jumlah</td>
<td>215</td>
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<td>41</td>
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</tbody>
</table>

\[ P \frac{f}{n} \times 100\% = 35.8\% \quad 58.33\% \quad 6.83\% \quad 0.667\% \]

From the table above shows all respondents' answers. In the first statement item, the respondents' answers chose strongly agree as many as 54 people (64%), who chose the agreed answer as many as 36 people (36%), who chose the answer to disagree as much as 10 people (10%) and the answer did not agree at all was not chosen by the respondent. From the explanation above, it can be concluded that the majority of the answers are strongly agree, meaning that the PKH recipient mothers already understand about PKH programs.

In the second statement item, the respondents who chose the answer strongly agree were 20 people (20%), who chose the answer agreed as many as 74 people (74%), who chose the answer less agree as much as 5 people (5%) and chose the answer disagree as much as 1 person (1%). From the explanation above, it can be concluded that the majority of the answers are agree, meaning that the requirements to join PKH are quite easy. In the third statement item, it shows that the respondents' answers regarding the existence of outreach activities/socialization of the goals of PKH, who chose the answer strongly agreed were 42 people (42%), who chose the answer agreed as many as 58 people (58%). Meanwhile, the respondents did not agree and disagree at all. From the explanation above, it can be concluded that the majority of the answers are in agreement, meaning that there are outreach activities/socialization of the goals of PKH.

The 4th statement item shows that the respondent's answers know the purpose of PKH, 37 people (37%), who chose the answer strongly agree, 63 people (63%). Meanwhile, the respondents did not agree and disagree at all, which were not chosen by the respondents. So from the explanation above, it can be concluded that most of the answers are agree, which means that respondents know the purpose of PKH. In the 5th statement item, it shows that the answers of respondents attending regular meetings of PKH activities, who chose the answer strongly agree as many as 25 people (25%), who chose the answer agree as many as 65 people (65%), who chose the answer disagree as much as 10 people (10%) and 0 people chose the answer that did not agree (0%).

From the explanation above, it can be concluded that the majority of the answers are in agreement, namely the PKH recipients attend regular meetings in PKH activities. In the 6th statement item shows that the respondents' answers regarding knowing the role of PKH facilitators, who chose the answer strongly agree as many as 27 people (27%), who chose the agree answer as many as 55 people (55%), who chose the answer disagree as much as 15 people (15%) and 3 people (3%). From the explanation above, it can be concluded that the majority of the answers were agreeing to know the role of the PKH facilitator.
Based on the table above shows that the effectiveness of Program Keluarga Harapan, namely the effectiveness of understanding the program in accordance with the questionnaire given to PKH recipients, produces a response that is in accordance with the alternative answers after calculating the data for 100 respondents, namely 34.16% of PKH participants' answers in understanding the program runs very effectively, then 58.33% of PKH participants' answers indicate that the program understanding is quite effective, 6.83% of PKH participants' answers indicate that it is less effective and the remaining 0.67% indicates that the understanding of the PKH program is not effective.

In determining the effectiveness of Program Keluarga Harapan on the effectiveness of understanding the program as shown in the table, researchers not only focused on very effective answers (SE), but also took into account the percentage of effective answers (E)[6],[7]. So the researchers added up the percentage of SE answers (34.16%) and E answers (58.33%) with the results of 92.49%. Thus, in accordance with the interpretation of the research that has been determined by the researcher himself, the result is that the effectiveness is categorized as 76%-100%. So it can be said that the Effectiveness of Understanding the Hope Family Program in Pulau Simardan Village, Tanjungbalai City is very effective.

### Table 1.2 Effectiveness of PKH Targeting

<table>
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\[\frac{1}{4} \times 100\% = 26.44\% \approx 45.53\% \approx 14.88\% \approx 13.44\%\]

From the table above shows all respondents' answers. In the 7th statement item, the respondent's answers chose strongly to agree as many as 31 people (31%), who chose the agreed answer as many as 55 people (55%), who chose the answer disagree as much as 12 people (12%) and chose the answer disagree as much as 2 people (2%). From the explanation above, it can be concluded that most of the answers are agree, meaning that PKH recipients have difficulty in meeting their daily needs.

In the 8th statement item, it shows that the respondents' answers regarding difficulties in meeting the educational needs of children, who chose the answer strongly agree as many as 17 people (17%), who chose the answer agree as many as 56 people (56%), who chose the answer disagree as much as 23 people (23%) and 4 people (4%). From the explanation above, it can be concluded that the majority of the answers are agree, meaning that PKH recipients have difficulty in meeting the educational needs of their children.

In the 9th statement item, it shows that the respondents' answers regarding the difficulties in meeting the health needs of children, who chose the answer strongly agree as many as 13 people
(13%), who chose the agree answer as many as 40 people (40%), who chose the answer less agree as much as 37 people, people (37%) and 10 people chose the answer to disagree (10%). From the explanation above, it can be concluded that the majority of the answers are agree, meaning that PKH recipients have difficulty in meeting the health needs of their children.

The 10th statement item shows that the respondent's answer regarding PKH recipients who have children aged 5-7 years who have not tasted elementary school education, who chose the answer strongly agree as many as 23 people (23%), who chose the answer agree as many as 58 people (58%), who chose the answer that did not agree as much as 0 people (0%) and 19 people chose the answer that did not agree (19%). From the explanation above, it can be concluded that the majority of the answers are in agreement, meaning that PKH recipients who have children aged 5-7 years have had elementary school education.

The 11th statement item shows that the respondents' answers regarding PKH recipients who have junior high school age children and children aged 15-18 years who have not completed high school education, who chose the answer strongly agree as many as 13 people (13%), who chose the answer agree as much as 20 people (20%), who chose the answer to disagree as much as 0 people (0%) and chose the answer to disagree as many as 67 people (67%). From the explanation above, it can be concluded that most of the answers are disagree, meaning that there are PKH recipients who do not have junior and senior high school age children.

The 12th statement item shows that the respondent's answer regarding the respondent is one of the right people to be registered as PKH participants, who chose the answer strongly agree as many as 63 people (63%), who chose the agreed answer as many as 37 people (37%), which 0 people chose the answer that did not agree (0%) and chose the answer that did not agree as much as 0 people (0%). From the explanation above, it can be concluded that the majority of answers are strongly agree, meaning that PKH participants have been right on target in choosing to become PKH recipients.

In the 13th statement item, it shows that the respondents' answers regarding the presence of PKH in meeting the educational needs of children, who chose the answer strongly agreed were 51 people (51%), who chose the agreed answer as many as 42 people (42%), who chose the answer disagreed as much as 7 people (7%) and 0 people chose the answer to disagree (0%). From the explanation above, it can be concluded that the majority of answers are strongly agree, meaning the presence of PKH in meeting the educational needs of children.

The 14th statement item shows that the respondents' answers regarding the presence of PKH in meeting the health needs of children, who chose the answer strongly agree as many as 17 people (17%), who chose the answer agree as many as 59 people (59%), who chose the answer disagree as much as 21 people (21%) and 3 people (3%). From the explanation above, it can be concluded that the majority of answers are strongly agree, meaning that the presence of PKH in meeting children's health needs.

In the 15th statement item, it shows that the respondents' answers regarding PKH assistance were right on target, 10 people chose the strongly agree answer (10%), 41 people chose the agree answer (41%), 34 people chose the least agree answer people (34%) and 15 people (15%). From the explanation above, it can be concluded that the majority of the answers are in agreement, namely that this PKH assistance has been carried out on target.

Based on the table above, it shows that the effectiveness of Program Keluarga Harapan, namely in the Setting of Targets section in accordance with the questionnaire given to PKH recipients, produces a response that is in accordance with the alternative answers after calculating data on 100 respondents, namely 26.44% of PKH participants' answers in targeting running very effectively, then 45.33% of PKH participants' answers indicated that the targeting was quite effective, 14.88% of PKH participants' answers indicated that it was less effective /
less targeted and the remaining 13.44% indicated that PKH targeting was not effective / not yet on target [7].

In determining the effectiveness of Program Keluarga Harapan in the setting of targets as shown in the table above, the researchers not only focused on very effective answers (SE), but also took into account the percentage of effective answers (E). So the researchers added up the percentage of SE answers (26.44%) and E answers (45.33%) with a result of 71.77%. Thus, in accordance with the interpretation of the research that has been determined by the researcher himself, the result is that the effectiveness is categorized as 51% - 75%.

So it can be said that the target setting for Program Keluarga Harapan in Pulau Simardan Village and Tanjungbalai City is quite effective. In determining the effectiveness of Program Keluarga Harapan in the Real Changes section as shown in the table, the researchers not only focused on very effective answers (SE), but also took into account the percentage of effective answers (E). So the researchers added up the percentage of SE answers (13.33%) and E answers (48%) with the results of 61.33%. Thus, in accordance with the interpretation of the research that has been determined by the researcher himself, the result is that the effectiveness is categorized as 51% - 75%. So it can be said that the real change in Program Keluarga Harapan in Pulau Simardan Village, Tanjungbalai City is effective.

4 Conclusion

Program Keluarga Harapan (PKH) in Poverty Alleviation in Pulau Simardan Village, Tanjungbalai City with the aim of alleviating poverty can be said to be effective. Program Keluarga Harapan (PKH) can be said to be ineffective and effective through the variables measuring the effectiveness and indicators of the effectiveness of Program Keluarga Harapan (PKH). The existence of conformity of expectations with the implementation of Program Keluarga Harapan (PKH). If so, then the expected goal of Program Keluarga Harapan (PKH) in alleviating poverty has been achieved.

Acknowledgement
The author expresses his gratitude to all parties who have been involved in this research, especially to all PKH users and those in charge of PKH, housewives, school children to officials who cannot be said one by one.

References


Tutors' Efforts to Overcome Early Children's Aggressive Behavior in PAUD Tunas Kartika Binjai

Yusnadi1, Rabiatul Adhawiyah2, Sani Susanti3, Vidya Dwi Amalia Zati4
{yusnadi@unimed.ac.id}

Community Education, Universitas Negeri Medan1234

Abstract. The purpose of this study was to find out how the efforts made by tutors in overcoming aggressive behavior in early childhood at PAUD Tunas Kartika, Binjai City. This study uses a qualitative approach with a descriptive method. The informants in the study consisted of 4 people and the data collection techniques were observation and interviews. The data analysis technique used is by collecting data, reducing data, presenting data and drawing conclusions. The results showed that the forms of aggressive behavior carried out by early childhood were hitting, pushing, breaking things, pinching, berating and cursing, mocking, saying dirty words and refusing to be spoken to. As for the efforts made by tutors in overcoming aggressive behavior in early childhood were by correcting the words spoken by children and giving them an understanding of good and bad things; the tutors make themselves as an inspiration and can make themselves as an example for the students; tutors provide good information to deal with children's aggressive behavior; tutors organize children's academic and non-academic activities; motivate children.

Keywords: Tutor's Role, Overcoming Children's Aggressive Behavior

1 Introduction

Early childhood education is an effort aimed at children from birth to 6 years which is carried out through the provision of educational stimuli to help physical and spiritual growth and development, so that children have readiness to enter the further education. This emphasizes that early childhood education is very influential at the next level. [10] The field of early childhood education development is the totality of children's potential. The development areas include physical-motor, language, social-emotional and cognitive.

However, in this research, the potential to be studied is related to the socio-emotional potential of children. Because in general, early childhood still tends to have unstable social-emotional abilities. Children still show the ability to interact that is less than the maximum. In addition, children are also not able to show stable emotional abilities. We can see this by the behavior shown by early childhood. Early childhood still tends to show aggressive behavior. Many factors influence a person to carry out aggressive behavior including social, personal, cultural, situational, resources and mass media factors [9]. [4] Gender and personality also affect a person in behaving aggressively. Aggressive behavior is hurting other people both verbally and physically [11].

The aggressive behavior must be handled immediately and get attention from both parents and teachers, because if it is left unchecked, it has a great chance of becoming a permanent behavior [6]. So, it needs to be handled seriously, because it can be fatal. This aggressive
behavior is also shown by early childhood children in PAUD Tunas Kartika in Binjai, out of 20 children, there are 11 children who show aggressive behavior. This aggressive behavior is carried out by boys and girls. Aggressive behavior carried out by children includes hitting, pushing, fighting, breaking things, pinching, kicking, scratching his friend's cheek, berating, swearing, insulting / mocking, said dirty and some even refused to speak.

In a day, there are children who do aggressive behavior once a day and some even do it up to eight times a day. Usually the tutor scolds the child and pinches the child to stop the act, but these actions do not stop the child, instead the child imitates the tutor's actions, namely scolding his friend. The punishment given by the tutor does not cause a deterrent effect on the child, but causes feelings of anger, so that the child repeats the actions another day, even they imitate the actions that the teacher has taken when venting his aggression.

The impact is a learning disability or inability to express thoughts and feelings, unable to play with peers because children prefer to do negative behavior than play and unable to accept opinions from peers and the surrounding environment. This shows that aggressive behavior carried out by children is a negative behavior that has a negative impact on children. It needs to be handled, so that the aggressive behavior does not increase and will not eventually become a habit for early childhood children. Based on this fact, the researchers are interested in seeing how the efforts made by tutors in overcoming aggressive behavior in early childhood at PAUD Tunas Kartika, Binjai.

**Aggressive Behavior**

According to [8] aggressiveness is defined as behavior that can cause personal injury to others, the injury can be physical or psychological. From this definition, it can be understood that aggressiveness is a behavior that can cause injury to others, both physically and psychologically. [1] Aggressive as an offensive behavior, either verbally or verbally or by making a threat that is used as a statement of hostility. This behavior can harm or injure others. The losses incurred can be in the form of psychological losses and physical losses.

Zirpoli (2008:440) says that aggressive behavior is a form of physical injury from other creatures that is automatically contained in the mind, which will appear with signs of anger or overflowing emotions, so that it can hurt others through harsh words or ridicule. Based on the opinions of the experts above, it can be concluded that aggressive behavior is a negative behavior carried out by children that can disturb, hurt and harm other people and objects around them.

Lancellota and Vaughn state that there are four types of aggressive behavior and children's reactions to social acceptance, namely: (1) provoked physical aggression, for example: attacking back following the provocation; (2) explosive aggression, for example: angry for no apparent reason; (3) verbal aggression, for example: threatening; and (4) indirect aggression, for example; telling the teacher that other students made mistakes (Vaughn and Bos, 2012: 106). Meanwhile, Baron and Byrne classify aggressive behavior into eight, including: (1) direct physical verbal aggression; (2) nonverbal active direct aggression; (3) passive verbal direct aggression; (4) nonverbal passive direct aggression; (5) verbal active indirect aggression; (6) nonverbal active indirect aggression; (7) passive verbal indirect aggression; (8) passive nonverbal indirect aggression (Fatturrohman, 2006: 207-208)

**The Impact of Child Aggressive Behavior**

This aggressive behavior is allowed to continue or even be defended, then the child has a great opportunity to grow into an individual with an anti-social personality [7]. These impacts can affect themselves and others. The impact for themselves, namely: will be shunned by their friends and have the bad self-concept, the child will be labeled as a naughty child so that they feel less secure and less happy. Impact on other people (environment), which can cause fear for
other children and will create unhealthy social relationships with their peers. In addition, it can disturb the peace of the environment because usually children who behave aggressively tend to damage things around them [5].

**Handling Child Aggressive Behavior**

According to [2] many roles are needed by teachers as educators to deal with children's aggressive behavior, as described below:

a. **Corrector**
   The teacher as a corrector in handling aggressive children, namely the teacher can reduce good values in children and notify children if the values are carried out will have a good impact on children, tell which values are bad and the consequences of bad behavior, for example the attitude of children behaving aggressively includes bad grades for negatively impacting or injuring others. Teachers must be able to distinguish between good grades and bad grades.

b. **Inspiration**
   The teacher as an inspirator in handling aggressive children, namely behavior and everything that appears from the teacher can be an inspiration for aggressive children to imitate the good things. Teachers must be able to provide good inspiration for the learning progress of students.

c. **Informator**
   The teacher as an informant in handling aggressive children, namely the teacher can provide information related to the values of life by showing exemplary films. Teachers must be able to provide information on the development of science and technology, in addition to learning materials for each subject that has been programmed.

d. **Organizers**
   The teachers as organizers in handling aggressive children, namely teachers can organize all activities related to academic activities with interesting activities and the application of active learning, so as to provide flexibility for children in activities during the learning process. The other side of the required role of the teacher in this field, teachers have activities to manage academic activities.

e. **Motivator**
   The teacher as a motivator in handling aggressive children, namely the teacher can provide enthusiasm, support and positive appreciation to children so that children actively learn and behave well. Teachers should be able to encourage students to be passionate and active in learning.

2 **Research Methods**

This research was conducted in July-October 2021 at PAUD Tunas Kartika, South Binjai, Binjai. The subjects in this study were 4 people. This research used descriptive qualitative approach. Data collection techniques used in this study were observation and interviews. Observation and interview techniques were carried out to observe and collect information through informants related to the role of tutors in dealing with children's aggressive behavior, namely as: correctors, inspiration, informants, organizers, and motivators.

The data analysis techniques used in this study include the credibility test to test the validity of the data and the triangulation technique to test the credibility of the data which is done by checking the data to the same source with different techniques.
3 Result and Discussion

Based on the results of the research that has been carried out, it shows that the implementation of the tutor's efforts as a corrector carried out by the tutor at PAUD Tunas Kartika Binjai has been carried out to the maximum, the tutor has given good and bad grades to students, especially to children who behave aggressively. The tutor has also provided education and guidance to the child, given a warning to the child if the actions taken have disturbed the peace and comfort of the classroom atmosphere, the tutor also urges other students to immediately report a child who is behaving aggressively. In addition, tutors also use electronic media and print media to convey good and bad grades.

In addition, tutors have also played their role as inspiration, tutors provide inspiration to students so that they can study well, especially children who behave aggressively. Before starting learning, the tutor gives motivational words to the learning community, this is done so that children are enthusiastic about participating in the learning to be studied and far from aggressive behavior.

In addition to providing motivational words as inspiration for children in learning, tutors also give confidence to children and continue to provide support for children's wishes, if the child's wishes have a positive influence on children, friends and tutors then they are able to control themselves and avoid aggressive behavior. The tutor invites the child to visit his friend who is sick and in trouble so that the child has a high social attitude and reduces his aggressive behavior, besides that the tutor also uses stories and stories of the prophets and apostles to the child so that the child becomes a good child and reduces aggressive behavior.

As an informant, the tutor has also provided information to students so that they can study well, especially to children who behave aggressively through electronic and print media as a means of conveying information. Tutors also use hand puppets in the form of animals in presenting stories and use different intonations for each character. In addition, the tutor also asks questions related to the content of the story and what we can do. As an organizer, tutors have made efforts to organize learning activities for students so that they can study well, especially for children who behave aggressively.

Tutors conduct group learning to build good interaction and cooperation between students, for example through playing puzzles, holding coloring competitions, guessing words with students, with the hope that students will try to overcome aggressive behavior in children. As a motivator, tutors have provided motivation to students in learning activities, especially to children who behave aggressively, so that they study well. Tutors also provide advice, motivation and support to children who behave aggressively so that they do good things. The motivation given is in the form of rewards in the form of star stickers, praise.

The results of interviews and observations that have been made from the four tutors who teach at PAUD Tunas Kartika show that there are changes experienced by children who engage in aggressive behavior. Efforts made by tutors in the form of correctors, inspirations, informants, organizers, and motivators have been successful, because of the 20 children in the class, 15 children show aggressive behavior, but after the efforts of the tutor, the number of children who behave aggressively decreases, namely as many as 10 children. Meanwhile, 5 children still want to do aggressive behavior but not as often as before.
4 Conclusion

Based on the results of the research that has been done, it can be concluded that the tutor's efforts in overcoming aggressive behavior in early childhood at PAUD Tunas Kartika Binjai consist of five, namely as correctors, inspiration, informants, organizers and motivators, have been able to have positive impacts on reducing aggressive behavior in early children. The children who previously liked to make noise, were undisciplined and liked to annoy their friends, now have shown a better attitude, of the 20 total children, 15 have shown good behavior, while 5 others still want to show aggressive behavior but only just once in a while.

Acknowledgment

The author would like to thank all those who have helped in the implementation of this research, in particular to teachers of PAUD Tunas Kartika Binjai.

References

Parents' Perception of the Use of Digital Book Reading App in Improving English Skills for Early Childhood

Ince Dian Aprilyani Azir1, Tria Zulviana2, Dhian Gowinda Luh Safitri3, Devi Oktari Harvens4, Roudlotul Islamiyah5
{inedian@polimedia.ac.id}

Politeknik Negeri Media Kreatif1, Indonesia, PT. Voca Cipta Indonesia2345

Abstract. Literature studies have shown benefits of using technology and multimedia to improve children's engagement and interest in learning. However, the use of technology for children is still receiving mixed views from parents. Digital books are an alternative innovation that can be used by parents to improve their children's English skills in a fun way. Incorporated features in digital books such as voiceover, interactivity, and background music can help children improve their vocabulary and comprehension. Digital books are also believed to be able to facilitate children's needs for access to a variety of books that can be read anywhere and anytime. This study focuses on parents' perception regarding the use of digital book reading applications in improving children’s English skills. This study used a descriptive qualitative method with five parents of children aged 4 - 8 years old who have used a digital book reading application named Vocacio for 14 days. The data in this study is obtained by doing an in-depth interview with the parents. The result of the study shows that parents have mixed perceptions regarding the use of digital book reading applications in improving children’s reading interest, reading comprehension, reading fluency, and English vocabulary.

Keywords: perception, digital book, English, early childhood

1 Introduction

Early language development is critical. Good language abilities may help children communicate. According to Faqhatuddinnyah and Rasyid [1], good English language skills play a role in children's future by establishing abilities related to building cooperation in the global world through education, utilization of science and technology, trade, and other activities. In relation to English language competencies, Indonesia is ranked #74 out of 100 countries and is included in countries with low English language skills based on the EF EPI [2]. Yamin [3] and Putri & Rasmita [4] stated that one way to improve English skills in children is through reading English books, including digital books. Reading can be a starting point for children to know and develop their English skills.

Children nowadays connect with digital media early on, including digital books. Digital books are a kind of digital media that may organize and arrange information for readers according to Prasetya, Wahyu, and Syaad [5]. Now, storybooks are also published in a digital form. According to Paciga [6], storybooks in English include interactive media that have the
potential to provide meaning, so as to improve literacy skills and English language skills. Yuan [7] also reveals that reading digital English storybooks can increase children’s sensitivity to the sound of the letters being read, knowledge of letters, and understanding of stories. Bates et al. [8] provides recommendations related to the features that should exist in digital books, including narration, hotspot, audio, and visuals.

Children’s digital books are becoming a multidisciplinary and methodological subject. The sharing of digital books with young children is different. For example, parents engage in more discussion on digital books than traditional ones, in which both parents and children can be more focused on the story elements [9]. Parental participation in their children’s reading activity will have a beneficial influence [10]. Therefore, this study involved parents engaging in the reading activity as parents are the first, primary and natural educators [11]. After the reading activity, parents are required to share their perceptions contributing to providing feedback on the use of digital books for children.

**Vocacio Reading App**

Various digital book reading applications have been widely developed to facilitate access to reading, one of which is Vocacio. Vocacio is a reading application for early childhood from Indonesia. It provides English digital books in various difficulty levels accompanied by interactive features that can be accessed through smartphones and tablets. The aforementioned features are listed in Table 1.

<table>
<thead>
<tr>
<th>Table 1. Features of Vocacio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Features available in Vocacio</strong></td>
</tr>
<tr>
<td>Independent reading and turning pages</td>
</tr>
<tr>
<td>Voice narration</td>
</tr>
<tr>
<td>Narration replays</td>
</tr>
<tr>
<td>Highlights on text when it’s read</td>
</tr>
<tr>
<td>Available for iPad</td>
</tr>
<tr>
<td>Available for Android</td>
</tr>
<tr>
<td>Interactive animations related to the story</td>
</tr>
<tr>
<td>Background music related to the story</td>
</tr>
</tbody>
</table>

Vocacio has three main features: library, multimedia, and diary. The library feature contains access to hundreds of storybooks from famous series. Multimedia feature consists of walking text, voice-overs, and voice recognition. The diary feature enables children to draw, type, or record their voice after reading. Furthermore, Vocacio has other features, i.e. independent reading and turning, highlights on text when it’s read, interactive animations related to the story, and background music related to the story. Vocacio is also connected with a learning management system called “ICANDO School”.

2 Research Methods

This study aims to explore the parent’s perception of using the English Reading app called Vocacio to improve children’s literacy and English language skill. Therefore, the researcher investigated this study through a qualitative inquiry, which according to Merriam [12] enabled the researcher to capture the participants’ understanding of particular experiences, their perspectives about some issues, and what factors might influence their opinions. Marshall & Rossman [13] as well as Gilham [14] explained that the qualitative approach also provides the design that allows the researcher to describe the importance of context, settings, participants' frames of reference, and the perspective of those involved. The participants were selected through purposive sampling. Cresswell [15] explains that in purposive sampling, the researcher
intentionally selects the particular participants to discover, understand, and gain insights into the specific phenomenon. The criteria for the research participants were: (1) parents of children aged 4-8 years old; (2) Agreed to follow the instruction of study for approximately two weeks; (3) Can operate a mobile phone.

Based on the criteria above, four parents and five children were selected to participate in this study. The researcher asked the parents to give their children one book a day for two weeks through Vocacio App. Participants’ children read the books by following the difficulty level, ranging from level 1 to level 3.

During the research process, the researcher considered ethical aspects of the study by seeking consent and explaining the investigation process to the participants. We also used a pseudonym to address the name of the parents and children in this study. The detailed backgrounds of the participants are elaborated in the table below.

<table>
<thead>
<tr>
<th>Participant's code</th>
<th>Education</th>
<th>Gender</th>
<th>Their Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Diploma degree</td>
<td>Female</td>
<td>Rara, girl, 8 years old</td>
</tr>
<tr>
<td>P2</td>
<td>Bachelor degree</td>
<td>Female</td>
<td>Eri, girl, 7 years old</td>
</tr>
<tr>
<td>P3</td>
<td>Bachelor degree</td>
<td>Female</td>
<td>Lisa, girl, 8 years old</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kayla, girl 8 years old</td>
</tr>
<tr>
<td>P4</td>
<td>Diploma degree</td>
<td>Female</td>
<td>Aly, boy, 7 years old</td>
</tr>
</tbody>
</table>

The semi-structured interviews were used to investigate this study. According to Merriam [16], semi-structured interviews enabled the researcher to capture qualitative experiences, opinions, information, and perceptions of participants.

After collecting the data through a semi-structured interview, the researcher started preparing and organizing the data for analysis. Firstly, the researcher organized all the data from the interviews' transcripts and the notes taken during the conversations. Cresswell [15] described transcription as converting audio recording or field notes into written data. The researcher then translated the data from Bahasa into English.

According to Temple & Young [17], taking translator roles offer researchers opportunities to give close attention to cross-cultural meanings and interpretations. The next step is analyzing the data. The data are analyzed using a thematic analysis, which according to Braun & Clarke [18] as well as King [19] allows a flexible approach that can be modified according to the study's needs and provides a comprehensive yet complex account of the data. The thematic analysis allowed the researcher to investigate the different perspectives of participants, highlight the similarities and differences, generate the participants' insights, and help the researcher create a clear and organized final report.

3 Result and Discussion

The study discovered the following key findings after analyzing the data collected based on four topics.

Reading Interest

Reading interest can be demonstrated by how engaged a child is during reading activities. According to Moody et al. [20], reading engagement can be defined as children’s ability to sustain attention over time when reading a storybook. Children’s engagement in reading can be seen from three behavioral dimensions, namely persistence in completing and maintaining
participation during reading, enthusiasm and excitement, and compliance with requests and directions.

We found that the research participants seem to be aware that their children showed interest and engagement in reading storybooks using the digital books reading app. P2 said: “She’s very happy with it... because it’s new to her, she becomes very interested in it. If I tell her that there’s a new story on Vocacio, she will immediately read it on her own.” This finding is in line with the study conducted by Richter and Courage [21], which found that children were more attentive and more engaged when reading digital books compared to printed books. In their study, Moody et al. [20] also found that children who read digital storybooks showed higher levels of persistence during the reading task, which may increase children's exposure to reading experiences and lead to better literacy skills.

Another interesting finding in regard to the relationship between prior experience in using digital book reading apps and children’s reading engagement. One of the research participants said: “She’s the one who reminds me. Especially during the first weeks where it’s brand new to her, she becomes very passionate. When she has finished reading one, she’ll continue to read other stories on her own. She can read several stories in one day.” Reich et al. [22] discovered that children who had little experience in using gadgets (i.e., smartphone or tablet) tend to be more focused on the storybook when it is presented on a digital platform. This finding suggests a potential benefit of novelty in instilling reading interest in children using digital books reading apps.

Vocacio has several features such as page zooming, narrated text, background music, sound effect, and voice recognition. Research participants found that most of these features positively affected their children’s interest in reading after using the aforementioned app. Regarding this matter, P2 shared her view. “There are (improvements). She’s more interested because the stories are more immersive.” According to Zhou and Yadav [23], interactive features provided in digital books may support children’s autonomy in reading. These features allow children to explore stories through touching and receiving feedback after their actions. Richter and Courage [21] also states that digital storybooks can also support struggling readers through interactive support, which offers opportunities for an individualized reading practice.

On the other hand, the voice recognition feature provides a less pleasant experience for children when they read using Vocacio. P3 shared in her own words: “They’re happy, indeed. During the day, they are happy because they are reading for pleasure. But at night, I told them to use voice recognition. So they feel like they’re being forced to learn to read. In addition, if they made a mistake, they have to repeat it thrice. It’s different when they read for pleasure and when they read books for studying.” We infer that the negative feedback children get when using the voice recognition feature might decrease the enjoyable experience when reading. This might hinder children’s motivation and interest in reading using Vocacio. Thus, this feature needs to be reviewed for better experience for children.

Reading Fluency

According to K. Goodman [24], reading fluency is a crucial aspect of one’s reading skills and the manifestation of reading skills. Meyer and Felton [25] said that a person is deemed to be fluent in reading when they are able to read fluently, automatically, and almost effortlessly. Thoermer & Williams [26] mentioned three key elements in reading fluency assessment, namely accuracy, automaticity, and prosody. Accuracy refers to someone’s decode precision when relating the visual of a written word to the phonological awareness or a sound that represents
said words. Automaticity occurs when someone is able to decode without any additional help, thus making it frequently related to reading rate. Reading accuracy and rate is not always proportional to understanding. Therefore, the element of prosody is needed. According to Couper-Kuhlen [27] and Kuhn et al. [28], prosody refers to the ability to read with correct expression, intonation, and pausing. Once someone is able to read with the correct prosody, they are deemed to have excellent fluency and comprehension as prosody is impossible to do without comprehension.

The interview with the participants has shown that their perception regarding improvement in reading fluency from 2 weeks of reading digital story books through Vocacio is positive. Interestingly, the improvement also has affected children’s fluency in speaking which can be seen from children’s narration of the previously read stories. “Because it’s in English, the advantages are that children can listen to the pronunciation and the correct intonation. Printed books can’t give such advantages. Before knowing VOCACIO, it was still difficult for her to read English books.”

Vocacio provides a narration feature that provides a native English pronunciation model complete with text pointers. According to Morris in Zipke [29], the text pointing feature makes recognizing words in isolation easier. A native-like natural narration also provides a model when children listen so they can imitate the pronunciation when they need to express it. Moreover, the voice recognition provided in VOCACIO enabled children to imitate what they have heard. Both experiences support word recognition and sight vocabulary which is related to automaticity improvement as stated in Baker and Bradley [30].

Vocabulary

According to Ouellette [31], there has been increased awareness of the positive correlation between vocabulary knowledge and reading comprehension for the past few years. Masrai [32] stated that vocabulary knowledge also became a reliable indicator of children's reading skills. Book reading activities can play a significant role in helping children develop and improve children's vocabulary. The responses of the research participants showed that children benefited from the use of Vocacio in terms of developing children's vocabulary, as P2 stated: “The purpose of trying a digital reading application like Vocacio is to make children love reading because there are plenty of interesting storybooks. In addition, when they read, their vocabulary will definitely improve.”

The participants’ views are in accordance with the studies that showed reading a storybook could enrich children's vocabulary, as it provides them with opportunities to hear new words as mentioned by Senéchal & LeFevre [33], builds print knowledge as stated by Baker [34], enhances their phonological awareness by exposing them to rhyme stories as revealed by Hayes [35], and develops the comprehension skill as stated in a study conducted by Lehr [36]. Vocacio enables children to access hundreds of books. As they read the books, they get exposed to words, consequently fostering children's vocabulary development. Other parents stated that there is an improvement in children's English skills after using Vocacio. She said that Lisa could use the vocabulary in writing text as a reflection of the story. “There’s definitely a change. They’re already at the stage where they can write and recount things in English. Although their speaking abilities aren’t too fluent, they’re already using some English words to retell in written form.”

Additionally, P3 argued that even though Lisa and Kayla have not been able to write using correct grammar yet, they could write some words from the story and draw pictures of it. Along the same line, P4 asserted that Avi often used the word in the book while playing pretend. The statement from the research participants showed that the children were not only exposed to vocabulary from books, but they could also use it in written text and conversation. We also
found another interesting statement concerning the benefits of the digital reading app on vocabulary development, as P2 stated:

“Her vocabulary improved. That’s the advantage of digital books when compared to printed books. Printed books don't have examples of how a word should be pronounced.”

This finding supported the investigation conducted by López-Escribano et al. [37], which emphasized that multimedia features such as narration provide scaffolding for children's literacy experiences. Digital books with audio narration could enhance children's vocabulary and raise their phonological awareness, indicating that using digital books independently may be a valuable practice for promoting children’s emergent literacy skills.

**Reading Comprehension**

According to Daro’aeni et al. [38], reading comprehension is the capacity to comprehend written material. Text comprehension is crucial to learning materials mastery. Developing comprehension skills is also important to prevent distortion and misunderstanding of the content. Thus, reading comprehension is important in school and in life. Vocacio as a reading application has the opportunity to improve children's reading comprehension skills through appropriate multimedia features and complementing the reading context. Vocacio as a reading app is also equipped with animation and pictures that increase understanding of the storyline as proven in several studies as mentioned by Verhallen, Bus, & de Jong [39].

According to Verhallen, Bus, & de Jong [39], animation and narration features in digital books will help children with poor comprehension skills to understand words and stories faster. Participants in this research also revealed that Vocacio is able to improve reading comprehension in early childhood. The pictures displayed in the books match the stories (telling the plot of the pictures), so children can understand the content of the story and recount the story that has been read. P-1 revealed:

“Indeed, she likes it. Moreover, when she learns from the digital book (Vocacio), she’s able to understand better. Perhaps it’s because of the pictures in the digital books which tell the plot of the pictures that she can understand reading through pictures.”

A meta-analysis study conducted by Takacz et al. [40] reveals that multimedia features such as voice narration, music, and animation have positive effects on children’s reading ability. P-3 explained in her own words:

“Oh, it depends on the story. There are stories they find amusing, such as Minnirella, when Mickey gave Minnie a surprise. There are also words that they find funny or stories that make them happy because the music is good. Since they’re twins, most of their expressions are identical.”

Vocacio also has the ‘*My Diary*’ feature as an in-app platform for children to recount the story in the form of pictures or voice recording. Repetition in reading digital books on Vocacio can be maximized using the ‘*My Favorite Book*’ feature as a shortcut for children to read their favorite books repeatedly. Research participant P-3 revealed that not only her children could retell the story in their mother language, but they also tried to use English, so she felt like their English skills developed really well.

Drawing on the aforementioned opinion, parental assistance is also one of the factors that determine children’s success in understanding stories. Parental assistance is also proven to be able to increase reading comprehension. Various studies show that children have a better understanding of stories when they read with parental assistance compared to using digital books with read-to-me mode independently as stated in Richter & Courage [21] and Takacz et al. [41]. In addition to developing children’s love for books from a young age, parents also become facilitators in clarifying features or stories that children do not understand. This is reflected in P-3’s explanation in the interview:
“There are (improvements). They’re more interested because the stories are more immersive. However, since the person reading the voice-overs appears to be a native speaker, sometimes children were not able to understand it. Therefore, they still need to be accompanied or listen to my explanation first to understand. They already love to read in the first place, both digital books or printed books.”

Based on the result of the study, it can be concluded that Vocacio is an application that can improve children’s reading comprehension. “My Diary” feature as well as various multimedia features such as music, narration, and voice recognition developed children’s interest in reading and unintentionally improved children’s ability to comprehend stories. The improvement in children’s ability to comprehend stories after using Vocacio can also be seen from children’s ability to retell stories in English.

4 Conclusion
Parents have a positive perception towards Vocacio digital reading apps. They believe that using digital books during reading has improved their children's reading engagement, vocabulary, fluency, and comprehension. Embedded features provided on the reading app enable children to exercise their English skills, both verbally and in writing.

Acknowledgement
We would like to thank PT.Voca Cipta Indonesia who have provided us opportunities to carry out this research. We also would like to thank our research participants for participating actively during the research process. May this research provide an insight for increasing early literacy in early childhood and become input for the development of the next VOCACIO application.

References


The Influence of the Langkat Smart Community Movement on Increasing Children's Interest in Reading in Langkat Regency

Sudirman1, Friska Indria Nora Harahap2, Anifah, Zahra Ulfah3
{sudirman64@unimed.ac.id}
Community Education, Universitas Negeri Medan

Abstract. This study aims to determine the influence of the Gerakan Langkat Pintar Community in increasing children's interest in reading in Kwala Bingai, Langkat Regency by using a descriptive quantitative approach. The sample in this study were 30 children. The data collection tool used is a questionnaire, with data analysis techniques using simple linear regression and hypothesis testing. The findings of this study based on data processing with simple linear regression obtained linear regression equation is $y = 51.778 + 0.744x$, with the product moment correlation $r_{xy} = 0.744$. $r_{count} > r_{table}$ is $0.744 > 0.306$ and the result of $t_{count} > t_{table}$ is $5.891 > 1.697$ then the hypothesis is accepted. So, it can be concluded that there is “The Influence of the Gerakan Langkat Pintar Community in Increasing Children's Reading Interest in Kwala Bingai, Langkat Regency.

Keywords: Gerakan Langkat Pintar Community and Children's Reading Interest

1 Introduction

Indonesia is one of the developing countries that continue to try to catch up with the developed countries in the world. Human development is one of the best ways to compete and be recognized by other countries by creating superior human resources. Excellent human resources are not just created without the efforts of various parties, positive habits, and a culture of hard work; Indonesian people are famous for their people's habits who still like to spend time just chatting about things that are not important compared to reading, Very easy to meet for example, in public places such as on public transportation, at stations, bus stops, and others, we often encounter many people spending their time chatting or conversing, playing games, some even doing nothing, and not infrequently many we meet many people to the library not to read but to chat. Very sad. This is in line with the opinion of Nafisah, A (2014), who said that a developing society is synonymous with storytelling culture compared to spending time studying and reading.

Based on a survey conducted by the Program for International Student Assessment (PISA) released by the Organization for Economic Co-operation and Development (OECD) in 2019 regarding literacy levels, it was stated that Indonesia was ranked 62 out of 70 countries studied (Larasati Dyah Utami. 2021). This means that the Indonesian people have a very low reading culture,
which automatically shows that the Indonesian people also have a low interest in reading, which impacts their low human development index, low innovation, and low community competitiveness. The low interest in reading is closely related to the poverty rate. According to the Head of the North Sumatra Library and Archives Service, Harlen Purba explained that in general, interest in reading in Indonesia, especially North Sumatra, is still low, especially among students or university students, measured by the number of pages they read, and how many books a day the people of North Sumatra read.

In line with the position of North Sumatra being ranked 18th among other provinces, where Aceh and NTB are above North Sumatra, where previously they were in a lower position (Antara Sumut, 2021). If this is left for a long time, it will give birth to the left behind the generation and impact the next generation. On the other hand, reading will increase knowledge and hone skills in improving the community's economic life. Reading and writing must be inculcated from an early age so that we can catch up and progress in several other countries, for that we need efforts from various parties, both the government and the efforts of the community organizations themselves. So far, we adhere to an oral culture, not a written culture. As a result, reading and writing habits become weak. By fostering interest in reading from an early age, it is hoped that reading culture can also be improved.

In Langkat Regency, there are still villages with the criteria of underdeveloped villages. One of the factors that cause Langkat to lag behind other districts is the low level of education and interest in reading. The literacy rate of Langkat residents is currently only 10 percent; if you look at the total population of Langkat, which reaches 1.8 million people, it means that the number of people who read is around 100 thousand people. The government has made improvements in the service sector by making several programs to foster reading interest, but this has not been maximized and is in line with the program's objectives. This shows that the low interest in reading in Langkat is a phenomenon that encourages the desire of several community groups to participate in social and self-help participation to seek and overcome the problem of low interest in reading in the community. One of them is the Gerakan Langkat Pintar (GLP).

The Gerakan Langkat Pintar (GLP) is a community group that cares about reading interest and has a vision to create people with a reading culture. The Gerakan Langkat Pintar collaborates with other communities consisting of students from Langkat Regency who are concerned for their hometown to be the driving force in holding this social activity. The Gerakan Langkat Pintar is a continuation of the Langkat Inspiration Class Community. Class Inspiration is a social activity that focuses on assisting the government in increasing children's motivation to go to school and continue their education to a higher level.

This social activity is a derivative program of the Indonesian Teaching Movement and has been implemented in various cities/districts in Indonesia, all of which, when collected together, will be referred to as the Nusantara Inspiration Class. The Gerakan Langkat Pintar (GLP) is a non-profit reading community that aims to mobilize the community, especially children in Langkat, to have a high interest in reading, considering that Langkat is one of the districts that still has disadvantaged villages compared to other districts or cities in Sumatra North. So the cultivation of a culture of reading interest in the Langkat community is very much needed. The GLP Reading Community has been running for a year and currently its activities start from Kwala Bingai Village which then continues to other sub-districts. Based on the background of the problem above, the author is
interested in researching how "The Influence of the Gerakan Langkat Pintar(GLP) in Increasing Children's Reading Interest in Kwala Bingai, Langkat Regency.".

2 Method

The research method used in this study is a descriptive method with a quantitative approach. The descriptive method provides a systematic, actual and accurate description of the facts, characteristics, and relationships between the phenomena being investigated. Based on this understanding, quantitative descriptive methods are very appropriate because this study will try to describe, describe, and analyze the Effect of the Gerakan Langkat Pintar in Increasing Children's Reading Interest in Kwala Bingai, Langkat Regency. The population in this study were all children who were visitors to the Gerakan Langkat Pintar Community Reading in Kwala Bingai, Langkat Regency which was then taken as a sample of 30 people using random sampling technique. This study uses a questionnaire as a research instrument with data analysis techniques using a simple linear regression test and hypothesis testing.

3 Result and Discussion

Smart Langkat Movement Community

The Gerakan Langkat Pintar Community is an independent social movement that focuses on calling for reading to build community resources, especially in Kwala Bingai, Langkat district. The background of this community being established is because of the low reading interest of the people in Langkat Regency, the lack of social institutions or communities that focus on growing people's interest in reading, and the mandate of the 1945 Constitution which is "to educate the nation" therefore reading, and instilling interest in reading is very important for the community to achieve an information literate society and a literate society who can seek, use and practice the information they need.

This community was founded on the initiative of Putri Nur Saraswati or better known as Putri Pule, a student of German Literature at UI who also came from Langkat to organize an educational activity together with other Langkat boys and girls visiting schools in Langkat and educating them. However, this routine educational activity turned out to be not enough, he finally decided to create an advanced community called the Gerakan Langkat Pintar Community.

The Gerakan Langkat Pintar Community continues to develop and innovate to become a professional community, able to spread the spirit of spreading benefits with real actions and become a community that can educate the community, especially Langkat children to continue reading, willing to read and become a literate society.

Gerakan Langkat Pintar Community Programs

Some of the programs that GLP has implemented include:

a. Book Donation; is a program where the Gerakan Langkat Pintar Volunteers as facilitators collect books from people who are willing to donate books by direct delivery or through delivery services. This program is continuous (no time limit) the more book donations you get,
the more children's interest in reading is formed. Usually, donors get information from social media or GLP Volunteers themselves.

b. Read; This program is a routine program of the Smart Langkat Movement whose activities are not monotonous, only come to read and then go home. Activities include reading books, reading, and small games. This Reading Program also invites children to gain new knowledge and broad insights from volunteers about books, they are also allowed to borrow books. This reading activity is intended to make children want to read books, besides that, this is also because there are still many children who do not have reading books because books are still not a primary need in the Langkat community. The participants who participate in this activity are usually people who know information from social media such as Facebook, Instagram, and other social media. The participants in this activity are those who deliberately come to take part in this activity, some people are currently/already carrying out sports activities around the square and are interested in participating in this activity.

c. Wara Wiri; This program is an educational tourism activity for children in the smart Langkat movement community to see the historical horizon and feel the atmosphere of this country’s diversity while learning outside their comfort zone in their area. The background of this program is the lack of facilities and infrastructure, remote access, and monotonous learning methods make it difficult for the nation's small lanterns to see this country's historical horizon and diversity.

d. GLP Cares; This program is an incidental fundraising program (occurring or carried out only on certain occasions or times) such as natural disasters or other donations. The activity of this program is to help repair damaged libraries in schools and areas that need assistance because the government may not have assisted them.

**Description of Research Result Data**

To complete the decryption of research data, a tendency test was conducted for each research variable categorized into 4 (four) categories of very good, good, good enough, not good. The complete calculation of the trend test of the research variables is in the appendix.

a. Test the trend of the Gerakan Langkat Pintar Community

The results of the Community tendency test can be seen in Table 10

<table>
<thead>
<tr>
<th>Group</th>
<th>Frequency</th>
<th>F relative</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;50</td>
<td>18</td>
<td>60%</td>
<td>Very Good</td>
</tr>
<tr>
<td>47-49</td>
<td>8</td>
<td>30%</td>
<td>Good</td>
</tr>
<tr>
<td>44-46</td>
<td>2</td>
<td>6.7%</td>
<td>Fair</td>
</tr>
<tr>
<td>41-43</td>
<td>1</td>
<td>3.3%</td>
<td>Poor</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Based on the data in the table above, it can be explained that for the Gerakan Langkat Pintar Community variable, the score is declared very good when it reaches > 50, totaling 18 people by 60%, the score is declared good when it reaches a value of 47-49 totaling 8 people by 30%, the score is declared sufficient good when it reaches a value of 44-46 totaling 2 people by 6.7%, the score is
declared unfavorable when it reaches a value of 41-43 totaling 1 person by 3.3%. An overview of the tendency test of the Gerakan Langkat Pintar Community in the following graphic form:

![Histogram of the GLP Community Tendency Test (X)](image)

**Fig.1.** Histogram of the GLP Community Tendency Test (X)

b. Test the tendency of children's reading interest

The results of testing the tendency of Children's Reading Interests can be seen in Table 11.

<table>
<thead>
<tr>
<th>Table 2. Tendency Test for Children's Reading Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>&gt;38</td>
</tr>
<tr>
<td>35-37</td>
</tr>
<tr>
<td>32-34</td>
</tr>
<tr>
<td>29-31</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Based on the data in the table above, it can be explained that for the Children's Reading Interest variable, the score is declared very good when it reaches >38, totaling 15 people by 50%, the score is declared good when it reaches a value of 35-37 totaling 5 people by 16.7%, the score is declared quite good when it reaches a value of 32-34 totaling 4 people by 13.3%, the score is declared not good when it reaches a value of 29-31 totaling 6 people by 20%. The description of the tendency test for Children's Reading Interest in the following graphic form:

![Histogram of Children's Reading Interest Tendency Test (Y)](image)

**Fig.2.** Histogram of Children's Reading Interest Tendency Test (Y)
**Description of Data Analysis of the Influence of the Gerakan Langkat Pintar Community in increasing Children's Reading Interest.**

To determine whether there is an influence in this study, the data analysis found by researchers in the field is carried out as follows.

a. **Simple Linear Regression**

To find out whether there is an influence of the Gerakan Langkat Pintar Community in Increasing Children's Reading Interest in this study, a study was carried out using simple linear regression. The analysis is used to predict the value of the independent variable to increase and decrease. From the calculation results, it is known that the regression equation is $Y = 51.77 + 0.744x$. Thus, it can be concluded that there is an influence of the Gerakan Langkat Pintar Community in Increasing Children's Reading Interest in Kwala Bingai.

b. **Hypothesis testing**

Hypothesis testing is carried out after knowing in advance the results of calculating the correlation coefficient of the variable $X$ to $Y$. The correlation coefficient is tested for significance by using the t-test. The correlation coefficient of the Gerakan Langkat Pintar Community on Children's Reading Interest from the calculation results it is known that there is a positive correlation between the Gerakan Langkat Pintar Community ($X$) and Children's Reading Interest ($Y$), meaning the greater the influence of the Gerakan Langkat Pintar Community, the greater the influence of Children's Reading Interest.

To find out whether the Gerakan Langkat Pintar Community has a significant influence in increasing Children's Reading Interest in Kwala Bingai, a t-test was carried out, and the results of the calculations obtained the t-count $> t$ table, namely $5.891 > 0.306$. While the magnitude of the contribution of the Gerakan Langkat Pintar Community Influence in Increasing Children's Reading Interest can be seen through the calculation of the determinants obtained a value of $D = 55\%$, meaning that the large or small increase in children's reading interest by 55% is influenced by the activities of the Gerakan Langkat Pintar Community while the remaining 45% is due to other factors which are not included in this analysis.

**Discussion**

The discussion presented in this study is the findings and results of data management related to the answers to research questions that have been raised in the formulation of the problem, namely: Description of the State of Children's Reading Interest in the Gerakan Langkat Pintar Community in Kwala Bingai, Langkat Regency. Interest in Reading Children before participating in reading stall activities in Kwala Bingai did not like reading this because they spent the whole day at school, and when they came home, some played, and some took private lessons. Data from the Langkat district librarian confirm this. The intensity of student attendance for the kwala bingai village is dominated by teenagers who like to read. Some are looking for assignments and others.

For the presence of visitors, especially children, it is very rare to find. Whereas through reading, children will get information related to the content of the reading itself. In line with Harahap's opinion, F.I.N. et al. (2021) say that reading is an important activity in life that can renew knowledge. Children's reading interest after the Langkat Smart Community activity can be seen from the above data processing where the condition of children's reading interest in Kwala Bingai is already quite good; this can be seen from the questionnaire results distributed to 30 respondents. They were very enthusiastic about participating in the activities organized by the Gerakan Langkat Pintar
Community. Some of them did not really like reading. With the Langkat Smart Movement, they became diligent in reading, as evidenced by the presence of these children every week. As long as these activities provide satisfaction, their interest will remain. Noorika Retno Widuri's (2008) theory that activities (two-way communication) can be successful if they cause pleasure. There is a change in attitudes and actions. This theory is by the research results that the Gerakan Langkat Pintar Community has increased Children's Reading Interest in Kwala Bingai.

The Influence of the Gerakan Langkat Pintar in Increasing Children's Interest in Reading in Kwala Bingai, Langkat Regency, from the observations of the researchers, the children were very happy to participate in the reading stall activities carried out by G.L.P. A person's interest can be seen in how he acts or behaves, starting from paying attention, observing, and listening when reading stall activities occur. From these activities, the child looks bored, bored, or even the child laughs and looks happy and listens carefully to what is said by the volunteer brother. Reading activities are carried out as a means to grow and increase interest in reading in children. The things that can be seen are as follows.

a. Intensity of Child Arrival in Reading Program

The intensity of the presence of these children can be said to be frequent because it can be seen from the attendance list that they attend every activity that takes place.

b. Children's interest in reading activities

From the description above, it is known that children are interested in the activities organized by the Gerakan Langkat Pintar Community. This is because open reading and interesting activities in the Langkat area are still new. In addition, the attitude of children when participating in activities such as listening, listening, and asking questions proves that children are very enthusiastic and active. They experience positive changes in attitude, become more enthusiastic, and start to like reading.

Based on the research results, the Gerakan Langkat Pintar Community affects increasing children's interest in reading through reading stalls. This can be seen from the reading implementation carried out by GLP. Children are very happy to participate in reading activities carried out by GLP. There was a change in the child's attitude and the action in the form of the intensity of the child's presence in participating in the reading activities carried out by GLP. Children initially looked normal, but after participating in reading activities, the children looked happy and interested in borrowing books.

From the results of data analysis, it can be seen that the results of this study indicate a significant influence between the variables of the Gerakan Langkat Pintar Community in Increasing Children's Reading interests. The coefficient of determination is 0.550, which means that the influence of the Gerakan Langkat Pintar Community (X) in increasing (Y) is 55%, and other variables outside of this study influence the rest. In the t-test, it is known that the tcount value is 5.891 and ttable is 1.697 with the provisions a significance level of 0.05 or 5%. Then, stating Ha is accepted as true. This means that there is a significant influence between the Gerakan Langkat Pintar Community in Increasing Children's Reading Interest in Kwala Bingai Langkat.
4 Conclusion

Reading activities that have been considered boring activities can change if done in the right way. In addition to the right way, support or motivation also greatly affects the growth of reading interest in someone. Like the movement carried out by the non-profit GLP community (Gerakan Langkat Pintar), which has accommodated and fostered children's interest in reading in Kwala Bingai Langkat with the various programs they carry out, it is clear from the enthusiasm of the children who are the targets of participating in the programs that have been made. In line with the test results, by comparing the t table (N = 30), the significance value is 0.05, the t test results are the Gerakan Langkat Pintar Community (X) variable, the t count value is 5.891 > the t table value is 1.697, and the significance value is 0.744 > 0.3061 then states that Ha is accepted as true. This means a significant influence between the Gerakan Langkat Pintar Community in Increasing Children's Reading Interest in Kwala Bingai Langkat.

Acknowledgment

Thank you to all those involved, Putri Nur Saraswati as the Community's founder who has given permission and convenience to the research team to conduct research. All volunteers of the Gerakan Langkat Pintar Community provided complete information regarding this research.

References

The Effect of Interpersonal Communication and Achievement Motivation on Commitment to Implement Education Quality Pledge Policies of Primary School Principals in Deli Serdang District

Nasrun\textsuperscript{1}, Tikwan Siregar\textsuperscript{2}, Dody Feliks Pandimun Ambarita\textsuperscript{3}, Husna Parluhutan Tambunan\textsuperscript{4}
\{nasrun@unimed.ac.id\textsuperscript{1}, tikwan@gmail.com\textsuperscript{2}, dodyambarita@unimed.ac.id\textsuperscript{3}, husnaparluhutan@unimed.ac.id\textsuperscript{4}\}

Faculty of Science Education, State University of Medan\textsuperscript{134}, Deli Serdang District Education Office\textsuperscript{2}

Abstract. The goals of this study are to determine the effect of interpersonal communication and achievement motivation on devotion to incorporate education quality pledge policies, as well as to develop a conceptual background (fixed model) that could define the framework of the causal association between independent variable and dependent variable. This study was carried out in 2020 at State Primary Schools across the Deli Serdang district, with a number of respondents of 236 individuals. The research variable data was collected using a valid questionnaire obtained from the results of rational assessment (Expert Judgement), and the instrument was trialed with 30 participants from the research population. Data analysis methods include descriptive analysis, analysis requirements testing, and path analysis with a significance level of 0.05. The overall path analysis yielded $F = 109.643$ with a significance value of $F_{count} 0.05$. The analysis results indicate that $H_0$ is rejected while $H_a$ is approved. As a result, there is a direct positive and significant impact on interpersonal communication and achievement motivation on the commitment of state primary school principals throughout the Deli Serdang district to incorporate education quality pledge policies. Furthermore, premised on the path analysis results, it was discovered that: (1) a significant path coefficient between interpersonal communication and achievement motivation is $p_{32} = 0.339$ and the direct effect is 0.114921 or 11.49%, (2) a significant path coefficient between interpersonal communication and commitment to implement education quality pledge policies is $p_{52} = 0.107$ and the direct effect is 0.011449 or 1.15%, and (3) a significant path coefficient between achievement motivation and commitment to implement education quality pledge policies is $p_{53} = 0.374$ and the direct effect is 0.139876 or 13.99%. Therefore, all of the tested path coefficients are significant, and if all paths in the model have significant path coefficients, then the suggested framework is perfect (the fit is perfect) with the data, according to the $Q$ test provisions.

Keywords: The Effect, Interpersonal Communication, Achievement Motivation, Commitment

1 Introduction

In Indonesia, primary school is the most basic level of formal schooling. Primary school (SD) can be completed in six years, beginning with Class I and ending with Class VI. SD aims to provide basic knowledge, religion and skills. In the context of educating the nation's life,
national education must obtaining knowledge and sculpt the character and civilization of a respectable nation. It should aim to help students reach their full potential as human beings who believe in and fear God Almighty, have good character, are healthy, intelligent, competent, creative, and self-sufficient, and are democratic and responsible citizens. In line with the opinion expressed by Rusman (2009: 427) said that education needs to be organized and directed at achieving the five pillars of knowledge, namely: (1) learning to have faith and fear of God Almighty; (2) learning to understand; (3) learning to act; (4) learning to coexist; and (5) learning to form identity (learning to be) [1]. Therefore, primary schools as educational organizations really need effective principal leadership, because through leadership behavior all components of the school organization can run better.

According to Regulation of the Minister of Education and Culture of the Republic of Indonesia no. 6 Year 2018, concerning the assignment of teachers as principal (15.1 and 15.2) stated that the principal's sole responsibility is to conduct the primary managerial functions, enterprise development, and teacher and academic staff supervision; the task aims to develop the quality of schools based on the 8 National Education Standards [2]. This explains why teachers' role as school principal is critical in bringing out the most essential management duties, such as entrepreneurial development and supervisory of teachers and academic staff, with the help of teachers.

Gultom (2009: 11) suggests that the leadership in institutions is very systematic as they can bring all of the organisation's activities together to attain a common purpose. This means that leaders can play a role in changing individual behavior into organizational behavior in achieving goals. Through the leadership of the principal, attitudes, motivation, knowledge, and commitment of his subordinates can be built in order to change individual behavior into organizational behavior, so that school effectiveness can be realized [3]. Regarding leadership in a school, Hechinger in the Direktorat Tenaga Kependidikan (2007: 6) states that There are no excellent schools led by poor school heads, and there are never any failing schools led by decent school heads. [4].

A different opinion was expressed by Luthans (2006: 248) who said that in addition to leadership, the headmaster's commitment to the school's vision, mission, and objectives is also critical. [5]. Thus, a headmaster with adequate leadership abilities should be supported by greater work commitment and a devotion to implementing education quality pledge policies so that he aspires to achieve the school's goals and objectives.

But in fact, the Minister of Education and Culture (2011: 7-8) stated according to the United Nations Development Program's (UNDP) Human Development Index, Indonesia's education ranking dropped from 108 in 2010 to 124 in 2011 [6]. Furthermore, Pakpahan (2009: 3) in his study, he mentioned an elaboration from the Ministry of National Education estimating that 70% of school heads in Indonesia are inadequate [7]. This illustrates the low commitment to implement education quality pledge policies from school principals.

Several factors contribute to school heads' lack of commitment to implementing education quality pledge policies. Interpersonal communication is one area that requires consideration. Kreitner and Knicki (2007: 381) suggest that commitment varies according to the elements that determine it, which are: (1). psychological and interpersonal, which involves ego defence system, motivation, and peer pressure; and (2). organisational factors, which includes communication and the organization's internal circumstance (3). project characteristics; and (4). Contextual [8]. Then, Ivancevich, Konopaste, and Matteson (2007: 234) which clarifies how leadership at the center of interpersonal communication has a direct impact on commitment [9].

Another important aspect is achievement motivation. Allen and Meyer (1997: 15) suggest that organizational commitment can be influenced by motivation and job satisfaction [10].
relation to commitment, different opinions were expressed by Colquitt, LePine, and Wesson (2009: 8) Individual characteristics such as character, cultural norms, and skill sets significantly impact personal functions such as work satisfaction, stress, encouragement, trust, and fairness, according to the integration model of organizational behavior. In addition, these individual mechanisms directly affect individual work outcomes which include organizational performance and commitment [11].

The equations of the concerns in this study are premised on the problem background described above: Does interpersonal communication impact achievement motivation? Is interpersonal communication a determinant in a person's willingness to follow on a pledge to improve education quality? and is achievement motivation affect commitment to implement education quality pledge policies? The goals of this study are to find out how interpersonal communication affects achievement motivation, how interpersonal communication affects commitment to implement education quality pledge policies, and how achievement motivation affects commitment to uphold education quality pledge policies.

2 Research Methods

This is an ex post facto research and was conducted at State Primary Schools throughout Deli Serdang district. A total of 236 headmasters were included in the study. The instrument consisted of survey questionnaire with favourable and unfavourable statements constructed according to the Likert Model. Each variable's constructs were used to generate all of the questionnaires. In the interpersonal communication questionnaire, there are five indicators to consider, including: (1) submission of information and orders to teachers in schools, (2) submission of data and information to superiors as the giver of authority, (3) submission of information and orders to employees at school, (4) submission of information, facts, data, messages, values to students, and (5) school relations with the community. The indicators will be defined in a statement of 21 items.

The achievement motivation questionnaire has four dimensions, such as: (1) carry out responsibilities in carrying out school work optimally, (2) Prioritizing school work achievements, (3) achievement of the highest goals in school, and (4) use all your attention and potential independently in achieving school work performance. The indicators will be comprehended in the statement of 40 items. There are six predictors of commitment to implementing education quality pledge policies, which are as follows: (1) mapping school quality needs, (2) make a school work plan, (3) carry out school management, (4) supervising the process of learning, (5) controlling and assessing the integration of the school work policy, and (6) developing educational strategic plan The predictors will be described in the 34 items.

It is important to test the instrument in order to obtain a validated and reliable instrument. The trial was conducted by 30 headmasters who shared similar characteristics based on the actual situation. The validity test begins with an expert's analysis (expert judgment), and then analyzes the validity and reliability statistically. The validity is calculated using the Correlation formula, and the reliability by Cronbach Alpha, with considered valid if r.count > r.table at 5% significance. The validity analysis revealed that not all items are valid for each questionnaire, as shown in table 1.
Table 1. The Results of Validity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total Statements Tested</th>
<th>Statements Not Valid</th>
<th>Statements Valid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal Communication (X₁)</td>
<td>21</td>
<td>2</td>
<td>19</td>
</tr>
<tr>
<td>Achievement Motivation (X₂)</td>
<td>40</td>
<td>5</td>
<td>35</td>
</tr>
<tr>
<td>Commitment to implement education quality pledge  policies (X₃)</td>
<td>34</td>
<td>5</td>
<td>29</td>
</tr>
</tbody>
</table>

Questionnaire statements are declared reliable if coefficient value (α) > reliability coefficient (0.70). The result of reliability is shown in table 2.

Table 2. The Results of Reliability

<table>
<thead>
<tr>
<th>Variables</th>
<th>α</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>X₁</td>
<td>0.853</td>
<td>High reliability</td>
</tr>
<tr>
<td>X₂</td>
<td>0.903</td>
<td>High reliability</td>
</tr>
<tr>
<td>X₃</td>
<td>0.892</td>
<td>High reliability</td>
</tr>
</tbody>
</table>

3 Results

3.1 Data Description

Table 3. Summary of Data Description of Each Research Variable

<table>
<thead>
<tr>
<th>Statistic Value</th>
<th>X₁</th>
<th>X₂</th>
<th>X₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>49</td>
<td>92</td>
<td>72</td>
</tr>
<tr>
<td>Minimum</td>
<td>23</td>
<td>40</td>
<td>38</td>
</tr>
<tr>
<td>Maximum</td>
<td>72</td>
<td>132</td>
<td>110</td>
</tr>
<tr>
<td>Sum</td>
<td>11.505</td>
<td>21.088</td>
<td>16.934</td>
</tr>
<tr>
<td>Mean</td>
<td>48.75</td>
<td>89.36</td>
<td>71.75</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.694</td>
<td>1.291</td>
<td>0.993</td>
</tr>
<tr>
<td>Variance</td>
<td>10.657</td>
<td>19.833</td>
<td>15.250</td>
</tr>
<tr>
<td>Variance</td>
<td>113.567</td>
<td>393.362</td>
<td>232.561</td>
</tr>
</tbody>
</table>

Following that, the category trend of each research variable is presented

3.2 Interpersonal Communication (X₁)

The category trend of interpersonal communication variable is shown in the table 4.
Table 4. Category Trend of Interpersonal Communication Scores

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Observation Frequency</th>
<th>Relative Frequency</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>62 - 76</td>
<td>30</td>
<td>12.71%</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>48 – 61.75</td>
<td>103</td>
<td>43.64%</td>
<td>Pretty good</td>
</tr>
<tr>
<td>3</td>
<td>33 – 47.25</td>
<td>81</td>
<td>34.32%</td>
<td>Not good</td>
</tr>
<tr>
<td>4</td>
<td>19 – 32.75</td>
<td>22</td>
<td>9.32%</td>
<td>Bad</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>236</td>
<td>100 %</td>
<td></td>
</tr>
</tbody>
</table>

3.3 Achievement Motivation ($X_2$)

Table 5 depicts the category trend of the achievement motivation variable

Table 5. Category Trend of Achievement Motivation Scores

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Observation Frequency</th>
<th>Relative Frequency</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>114 - 140</td>
<td>33</td>
<td>13.98%</td>
<td>High</td>
</tr>
<tr>
<td>2</td>
<td>87 - 113</td>
<td>97</td>
<td>41.10%</td>
<td>High enough</td>
</tr>
<tr>
<td>3</td>
<td>60 - 86</td>
<td>88</td>
<td>37.29%</td>
<td>Not high enough</td>
</tr>
<tr>
<td>4</td>
<td>35 - 59</td>
<td>18</td>
<td>7.63%</td>
<td>Low</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>236</td>
<td>100 %</td>
<td></td>
</tr>
</tbody>
</table>

3.4 Commitment To Implement Education Quality Pledge Policies ($X_3$)

The category trend of commitment to implement education quality pledge policies variable is shown in the table 6.

Table 6. Category Trend of Commitment to Implement Education Quality Pledge Policies Scores

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Interval</th>
<th>Observation Frequency</th>
<th>Relative Frequency</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>95.5 - 116</td>
<td>16</td>
<td>6.78%</td>
<td>Strong</td>
</tr>
<tr>
<td>2</td>
<td>72.5 – 94.5</td>
<td>96</td>
<td>40.68%</td>
<td>Strong enough</td>
</tr>
<tr>
<td>3</td>
<td>49.5 – 71.5</td>
<td>105</td>
<td>44.49%</td>
<td>Less Strong</td>
</tr>
<tr>
<td>4</td>
<td>29.0 – 48.5</td>
<td>19</td>
<td>8.05%</td>
<td>Weak</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>236</td>
<td>100 %</td>
<td></td>
</tr>
</tbody>
</table>

3.5 Normality test

Normality testing was performed using the Kolmogorov-Smirnov Test to retrieve a normal distribution of data from each variable in this study. Data for each variable was shown to be normally distributed if Absolute value or $D_{count} < D_{table}$ (0.08853). Table 7 summarizes the findings of the normality test.
Table 7. Summary of Normality Test

<table>
<thead>
<tr>
<th></th>
<th>X₁</th>
<th>X₂</th>
<th>X₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>236</td>
<td>236</td>
<td>236</td>
</tr>
<tr>
<td>Normal Parameters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>48.75</td>
<td>89.36</td>
<td>71.75</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>10.657</td>
<td>19.833</td>
<td>15.250</td>
</tr>
<tr>
<td>Most Extreme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absolute</td>
<td>0.052</td>
<td>0.054</td>
<td>0.053</td>
</tr>
<tr>
<td>Positive</td>
<td>0.052</td>
<td>0.053</td>
<td>0.053</td>
</tr>
<tr>
<td>Negative</td>
<td>-0.039</td>
<td>-0.054</td>
<td>-0.039</td>
</tr>
<tr>
<td>Test Statistic</td>
<td>0.052</td>
<td>0.054</td>
<td>0.053</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>0.200²</td>
<td>0.087²</td>
<td>0.200²</td>
</tr>
</tbody>
</table>

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

3.6 Linearity Test and Significance of Regression

The linearity test is done to evaluate the linear relation between studied variables, and the Regression Significance has been used to identify the relation between variables. If the significance of Fcount is greater than 0.05, the linearity test is H₀ denied, Hₐ approved. If the significance of Fcount is greater than 0.05, the requirements for the Regression Significance are H₀ denied Hₐ approved. Table 8 summarizes the linearity test and the Regression Significance analysis.

Table 8. Summary of Linearity Test and Significance of Regression

<table>
<thead>
<tr>
<th>No.</th>
<th>Exogenous Variable to Endogenous Variable</th>
<th>Linearity Test</th>
<th>Significance of Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F_count</td>
<td>Sig.</td>
</tr>
<tr>
<td>1</td>
<td>X₁ to X₂</td>
<td>1.309</td>
<td>0.109</td>
</tr>
<tr>
<td>2</td>
<td>X₁ to X₃</td>
<td>1.010</td>
<td>0.465</td>
</tr>
<tr>
<td>3</td>
<td>X₂ to X₃</td>
<td>1.271</td>
<td>0.107</td>
</tr>
</tbody>
</table>

3.7 Hypothesis Test

Table 9 displays the calculated correlation coefficient (r) and path coefficient (p) values between the studied variables.

Table 9. Results of Correlation Coefficient and Path Coefficient

<table>
<thead>
<tr>
<th>Hypothesis Number</th>
<th>Correlation Coefficient</th>
<th>Path Coefficient</th>
<th>T_count</th>
<th>Significance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>r₂₃ = 0.405</td>
<td>p₃₂ = 0.339</td>
<td>6.043</td>
<td>0.000</td>
<td>Meaningful Path</td>
</tr>
<tr>
<td>2</td>
<td>r₂₅ = 0.423</td>
<td>p₅₂ = 0.107</td>
<td>2.505</td>
<td>0.013</td>
<td>Meaningful Path</td>
</tr>
<tr>
<td>3</td>
<td>r₃₅ = 0.737</td>
<td>p₅₃ = 0.374</td>
<td>6.547</td>
<td>0.000</td>
<td>Meaningful Path</td>
</tr>
</tbody>
</table>
Table 9 shows that three proposed hypotheses are supported because $t_{count} > t_{table}$. It follows that the three path coefficients are significant. Interpersonal communication (X1) can thus have a significant impact on achievement motivation (X2), with a path coefficient of 0.339 and a correlation coefficient of 0.405. Interpersonal communication (X1) has a direct effect on commitment to incorporate education quality pledge policies (X3), with a path coefficient of 0.107 and a correlation coefficient of 0.423. Achievement motivation (X2) has a direct impact on commitment to implement education quality pledge policies (X3) with the path coefficient of 0.374 and the correlation coefficient of 0.737.

3.8 Goodness of Fit Model
The goodness of fit model's goal is to see how well the proposed model fits the data

$$Q = \frac{1 - R^2_m}{1 - M}$$

$$R^2_m = 1 - \left( 1 - R^2_1 \right) \left( 1 - R^2_2 \right) \left( 1 - R^2_3 \right) \left( 1 - R^2_4 \right)$$

If $Q = 1$, the model's fit meets all of the criteria. There are no path coefficients that are not significant based on the analysis results, so the suggested model has a perfect fit with the data.

4 Discussion
a. The Impact of Interpersonal Communication on Achievement Motivation
The findings of the hypothesis test reveal that interpersonal communication has a significantly positive direct impact on achievement motivation, with path coefficient of 0.339. Thus, achievement motivation changes are determined by interpersonal communication changes and increasing achievement motivation can be done by increasing interpersonal communication. This finding supports the theory from Newstrom and Davis (2007: 98) which states that communication affects motivation.

b. The Effect of Interpersonal Communication on Commitment To Implement Education Quality Pledge Policies
With a path coefficient of 0.107, the conclusions of the hypothesis test expose that interpersonal communication also has positive and statistically significant direct effect on commitment to incorporate education quality pledge policies. Thus, the changes in commitment to implement education quality pledge policies are determined by changes in interpersonal communication. This finding supports the theory from Steers and Porter (2003: 247) suggest that the formation of commitment occurs through three stages, namely: (1) compliance, accepting most of the influence to get something from other people, (2) identification, accepting influences that can cause pleasant things and build relationships, and (3) internalization, the stage where individuals find values.

c. The Effect of Achievement Motivation on Commitment To Implement Education Quality Pledge Policies
The study findings of the hypothesis test demonstrate that achievement motivation has a direct and significant influence on commitment to implement education quality pledge policies with path coefficient of 0.374. Thus, the changes in commitment to implement education quality pledge policies are determined by changes in achievement motivation. These findings support the theory from Wahjosumidjo (2001: 42) states that there are two types of factors that influence motivation: intrinsic factors that drive motivation from within the internal and extrinsic factors that come from outside the individual.
5 Conclusion

The study's findings indicate that interpersonal communication has a positive and direct effect on achievement motivation, with a path coefficient of 0.339. Furthermore, with a path coefficient of 0.107, there is a favorable direct impact of interpersonal communication on commitment to incorporate education quality pledge policies, and there is a decisive positive impact on achievement motivation on commitment to implement education quality pledge policies with path coefficient of 0.374.

References

Collaborative Group Work in Online Learning: The Contribution of Student’s Self-Regulation and Emotion Regulation

Shofia Mawaddah1, Asiah2, Khairun Nissa3, Utami Nurhafsari Putri4
{shofia.mawaddah@unimed.ac.id}

Guidance and Counselling Department, Universitas Negeri Medan123, English Education Department, Universitas Alwashliyah Sumatera Utara3

Abstract. Despite growing research on collaborative group work, there still is limited research on how group members productively regulate collaborative processes, particularly in online learning settings. The purpose of this study is to identify the impact of students' self-regulation and emotion regulation on collaborative group work in the online learning environment. This study included 157 higher education students who studied in collaborative group work settings during online learning at Universitas Negeri Medan. Data were collected using self-administered questionnaires and analysed using multiple linear regression. The findings of this study indicated that self-regulation and emotion regulation during online learning have a 62.1% simultaneous impact on collaborative group work. Self-regulation, in particular, was discovered to have the greatest impact (54.1%). Furthermore, the t-test results demonstrate that the tendency to regulate emotions through expressive suppression has a negative impact on collaborative group work.

Keywords: Collaborative Group Work, Self-Regulation, Emotion Regulation

1 Introduction

During the Covid-19 pandemic, the Indonesian government, through the Ministry of Education and Culture, mandated that all educational units shift from face-to-face to online learning. This policy was put in place to lower the risk of the Covid-19 virus spreading. It is outlined in the notification letter No. 36962/MPK.A/HK/2020 issued by the Minister of Education and Culture, which mandates online learning activities from April 2020 to the present. Online learning allows students to study at their own time and in their preferred location. As a result, students who participate in online learning have a greater need for autonomy in their studies [1]. During online learning, students must actively plan their learning, determine their learning objectives, and evaluate their learning processes and outcomes. These activities are also referred to as self-regulated online learning [2].

According to Zimmerman [3], students with strong self-regulation will actively participate in their learning process. They can regulate themselves well beginning with learning preparation, continuing through the learning process, and actually ended with the evaluation of their learning and achievement [4]–[6]. As a consequence, even if this role is not explained to students, self-regulation plays an important role in learning [7]. Furthermore, Schraw [8] suggested that self-regulation motivates learners to become impartial and independent learners, allowing them to continue their education as lifelong learners with less support from lecturers.

For the purposes of this study, self-regulation is operationally regarded as a combination of behaviour patterns that include awareness, understanding, and cognitive control, decent time
and resource management, the ability to regulate effort, including the ability to maintain focus and complete tasks, and the ability to identify the need for help and to pinpoint and use sources of help [6], [8], [9].

Students' experiences and feelings shift dramatically during online learning. This drastic change in lifestyle is undoubtedly difficult, particularly in terms of how well a student can regulate his emotions during the learning process. Emotions are vital for survival because they alert one to actively pursue out benefits and avoid downsides. Extremely strong emotions, on the other hand, are not always versatile. Successful emotion regulation is linked to better such as increased self-regulation and psychological well-being [10]. Emotion regulation approaches can have varying effects on personal experiences, cognitive processing, behavioural patterns, and well-being [11].

People use different emotion regulation strategies, such as cognitive reappraisal and expressive suppression [12]. The key aim of emotion regulation are to understand and identify one's emotions, manage and regulate them into more positive emotions, interpret emotions in peer interactions in a more healthy manner, and make better decisions [13]–[16]. Furthermore, Pekrun [13] assumed that positive and negative feeling could have a major impact on task-related metacognition, involvement, and subsequent on-task motivation. These characteristics are important in supporting one's self-regulation and predicting one's ability in collaborating in group work.

Collaborating with peers has been shown to improve learning and achievement in research findings. As a direct consequence, encouraging and promoting collaborative group work is extremely advantageous [8], [9]. Many teachers are trying to integrate online groups into their teaching methods as a result of digital advancements in education. Some research findings also suggested that collaborative group work is significant in fostering students' self-regulation in the classroom context. According to Zimmerman [17] and Greene, et. al [18], the best strategy for improving students' self-regulation is to give them opportunities to practice with peer group. This importance has the inverse result; therefore it is safe to conclude that the collaborative group work approach is associated to the students’ ability of self-regulation and emotion regulation.

The collaborative group work approach fosters student development and allows them to put their newly acquired skills to use. Its learning environment required students to cultivate self-awareness, self-management, social awareness, relationship skills, and responsible decision-making abilities (Durlak et al. 2007). Collaborative group work is critical for students to become more involved in their learning, more independent and accountable for their learning, and to attain better self-regulation in their achievement [20], [21]. This approach promotes interaction and fosters a collaborative and respectful culture among students.

The majority of previous empirical findings, however, have focused on collaborative group work in face-to-face learning settings. Therefore, this study attempts to place a greater emphasis on collaborative group work approach in online learning environments. The purpose of this study is to determine the impact of students' self-regulation and emotional regulation on their ability to collaborate in group work settings, especially in online learning environments. This study is expected to increase understanding of self-regulation and emotion regulation as predictors of students' collaborative group work abilities.

2 Research Methods

A quantitative research approach was used in this study. The independent variable consisted of two variables: the student's ability to self-regulate and the student's emotional regulation. Furthermore, the ability of students in collaborative group work is the independent variable in
In this study, the ability of students to self-regulate in online learning was measured using a 36-item self-regulated online learning questionnaire [2]. The Emotion Regulation Questionnaire (ERQ) developed by Gross and John [22] was used to assess emotion regulation ability. It is a 10-item scale aimed at assessing students' ability to regulate their emotions in two ways: 1) cognitive reappraisal and 2) expressive suppression. Furthermore, in this study, the dependent variable was measured using a collaborative group work questionnaire. This questionnaire contains 32 items that accommodate four dimensions of collaborative group work, notably: 1) Cooperating, 2) Coordination, 3) Communication, 4) Reassurance, and 5) Conflict Resolution.

The questionnaires were completed by 157 students who participated in collaborative group work during online learning. Purposive sampling was used as a sampling technique. In this study, the two independent variables and the dependent variable underwent a series of classical assumption tests, including the normality test, linearity test, multicollinearity test, and heteroscedasticity test. Based on the results of the classical assumption test, it was confirmed that both the independent variables and the dependent variable in this study were normally distributed, linear, and no indications of multicollinearity or heteroscedasticity, indicating that the requirements for conducting multiple linear regression analysis were met and could be carried out.

3 Results and Discussion

Multiple Regression Analysis

The results of multiple regression analysis are summarized in Table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficients</th>
<th>t_{table}</th>
<th>t_{value}</th>
<th>Sig.</th>
<th>Hypothesis Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constanta</td>
<td>77.508</td>
<td>1.660</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Regulation (X1)</td>
<td>12.231</td>
<td></td>
<td>0.000</td>
<td>Accepted</td>
<td></td>
</tr>
<tr>
<td>Cognitive Reappraisal Emotion Regulation (X2)</td>
<td>2.640</td>
<td></td>
<td>0.009</td>
<td>Accepted</td>
<td></td>
</tr>
<tr>
<td>Expressive Suppression Emotion Regulation (X3)</td>
<td>-0.701</td>
<td></td>
<td>0.484</td>
<td>Rejected</td>
<td></td>
</tr>
</tbody>
</table>

According to Table. 1 above, the significance value (Sig.) in the F-test is 0.000 < 0.05, and the F_{value} value is 86.287 > 2.68 (F_{table}), therefore, similar to decision making in the F-test, it can be concluded that the hypothesis in this study is accepted, or, in other words, self-regulation and emotional regulation affect collaborative group work ability simultaneously. Table 1 also has shown that self-regulation and emotion regulation simultaneously contributed 62.1% to the collaborative group work ability variable in this study.

Furthermore, a t-test was performed to determine the partial effect of the variables, as shown in the Table. 2, see below:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficients</th>
<th>t_{table}</th>
<th>t_{value}</th>
<th>Sig.</th>
<th>Hypothesis Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constanta</td>
<td>77.508</td>
<td>1.660</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Regulation (X1)</td>
<td>12.231</td>
<td></td>
<td>0.000</td>
<td>Accepted</td>
<td></td>
</tr>
<tr>
<td>Cognitive Reappraisal Emotion Regulation (X2)</td>
<td>2.640</td>
<td></td>
<td>0.009</td>
<td>Accepted</td>
<td></td>
</tr>
<tr>
<td>Expressive Suppression Emotion Regulation (X3)</td>
<td>-0.701</td>
<td></td>
<td>0.484</td>
<td>Rejected</td>
<td></td>
</tr>
</tbody>
</table>
According to the t-test results, the Self-Regulation (X1) variable has a significance value (Sig.) of 0.000 < 0.05 and a t value of 12.231 > 1.660 (t table), as a consequence, we can conclude that the first hypothesis is accepted. It thus means that the self-regulation variable (X1) effects the collaborative group work ability (Y). Furthermore, the Cognitive Reappraisal Emotion Regulation (X2) variable has a Sig. of 0.009 < 0.05 and a t value of 2.640 > 1.660 (t table). It is possible to conclude that the variable Cognitive Reappraisal Emotion Regulation (X2) influences the collaborative group work ability (Y).

Lastly, with a significance value (Sig.) of 0.484 > 0.05 and a t value of -0.701 < 1.660 (t table), it can be concluded that the Expressive Suppression Emotion Regulation (X3) variable has no effect and is negatively related to collaborative group work ability (Y). Following that, Table 3 below describes the results of statistical calculations for the effective contribution and relative contribution of self-regulation variables and emotional regulation that affect the collaborative group work ability variable.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Correlation Coefficient</th>
<th>Effective Contribution (%)</th>
<th>Relative Contribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Regulation (X1)</td>
<td>0.703</td>
<td>0.782</td>
<td>54.1</td>
<td>87</td>
</tr>
<tr>
<td>Cognitive Reappraisal Emotion Regulation (X2)</td>
<td>0.164</td>
<td>0.498</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Expressive Suppression Emotion Regulation (X3)</td>
<td>-0.038</td>
<td>0.074</td>
<td>-2.96</td>
<td>-4.7</td>
</tr>
</tbody>
</table>

Based on the data analysis above, it is known that the self-regulation variable (X1) has the effective contribution value of 54.1% and the relative contribution value of 87 %. In comparison, the variable Cognitive Reappraisal Emotion Regulation (X2) has the effective contribution value of 8% and the relative contribution value of 13%. Nevertheless, the variable Expressive Suppression Emotion Regulation (X3) has an effective contribution value of -2.96% and a relative contribution value of -4.7%. Based on the findings of the above analysis, it is reasonable to suggest that the self-regulation variable (X1) has a greater influence on the collaborative group work ability variable (Y) than the two emotional regulation variables (X2 and X3 respectively).

We proposed a self-regulated and emotional regulation learning approaches for supporting collaborative group work learning by examining the self-regulated online learning ability and emotion regulation tendency of students who took classes with group work settings. The findings revealed that self-regulation and emotional regulation had a 62.1 % simultaneous influence on the collaborative group work ability variable. While the remaining 37.9 % is influenced by variables not investigated in this study. According to the findings of the data analysis, self-regulation has the strongest effect, with an effective contribution of 54.1 % and a relative contribution of 87%. As a result, students with better self-regulation tend to have better collaborative group learning abilities.

We discovered that self-regulation ability and cognitive reappraisal approach in emotion regulation can have a significant impact on collaborative group work ability. This was line with the findings of Zheng, Li, and Huang [23] and Jarvela and Hadwin [24], who discovered that a regulated learning strategy, particularly in social contexts, enhances collaborative group functional ability.
The results of the coefficient of determination analysis for the cognitive reappraisal emotion regulation variable indicate that emotional regulation linked with cognitive reappraisal has a simultaneous positive influence on a person's ability to work in groups with an effective contribution value of 8% and a relative contribution value of 13%. Individuals who seem to have cognitive reappraisal emotion regulation tend not to have difficulty learning in collaborative groups. The findings of this study support Han's [16] conclusion that individual emotional intelligence and social bonding among students become important factors in facilitating positive interactions in online learning and potentially reducing transactional distance between people. Gross[11] explained that cognitive reappraisal is an assertive emotion regulation technique that takes place in the early stages of emotion experience. This strategy aims to alter emotional experiences by modifying cognitive processes, which involve the re-interpretation of emotional events.

The coefficient of determination analyses prove that the variable expressive suppression emotion regulation has no impact on a person's ability to learn in groups and has negative values with an effective contribution value of -2.96 % and a relative contribution value of -4.7 %. Individuals with expressive suppression emotion regulation have weak collaborative group work skills. Expressive suppression approach A response-focused emotion regulation strategy is expressive suppression. It suppresses emotional responses (such as facial gestures) that are about to appear or are already happening in order to regulate emotion experience [22]. If students use an expressive suppression approach in online learning where there are almost no face-to-face meetings, interaction will be extremely difficult. As a consequence, they will be unable to rely on one another and eventually will be unable to collaborate in group work effectively.

4 Conclusion

We can conclude that self-regulation and emotional regulation have simultaneous influence on the collaborative group work ability variable. If compared to expressive suppression, the type of emotion regulation with cognitive reappraisal has the greatest impact on a person's ability to collaborate in group work. Several flaws are evident in this study. This study's findings were entirely based on self-report data collected via a questionnaire. As a necessary consequence, future research should be able to use various instruments to measure the collaborative group work process. Thus, the research findings can provide a comprehensive picture of the challenges encountered in collaborative group work.

References

Development of Audio-Visual Learning Media IT-Based on Thematic Learning Primary School

Naeklan Simbolon1, Miranda Roulina Silitonga2, Eva Betty Simanjunta3, Try Wahyu Purnomo4

{naeklan@unimed.ac.id}

Fakultas Ilmu Pendidikan Universitas Negeri Medan1234

Abstract. The purpose of this study was to determine the feasibility of ICT-based audio-visual learning media. The type of research used is Research and Development. The subjects of this study were third grade elementary school students in Belawan. Data collection techniques using interview instruments and questionnaires. The results of the research from material experts show that ICT-based audio-visual learning media has a feasibility percentage of 84% in the Very Eligible category. The validation results from media experts obtain a feasibility percentage of 88% and fall into the Very Eligible category. Individual trials obtained an eligibility percentage of 93.3% in the Very Eligible category. So it can be concluded that the ICT-based audio-visual learning media is suitable for use in the process of learning activities.

Keywords: Learning Media, Audio Visual, ICT

1 Introduction

Learning is an interaction directly or indirectly that occurs between teachers and students. A learning will be carried out well if the teacher can choose the right media and learning methods. Media is everything that can be used to channel messages from the sender to the recipient of the message so as to stimulate the thoughts, feelings, attention, and interests and willingness of students (Simanungkalit, 2019). The use of learning media is very important to increase student learning activity, eliminate boredom, and the main thing is that students easily understand the material being studied.

The learning process without using media, students find it difficult to understand the material presented. The learning media developed will be very useful for teachers and students in the learning process. A teacher is required to be creative in order to be able to create learning media to create an effective and fun learning atmosphere. One of the learning media that can attract attention and create effective learning is audio-visual media. Audio-visual media is a tool that is used in the form of audio that is equipped with visuals, writing and colors. By using audio-visual media, it is hoped that students will easily remember and understand what they see and hear, making it easier for students to understand the learning material.

Along with the development of information and communication technology in the world of education, a teacher is required to be able to master it. This is in order to adapt to existing advances so as not to lag behind existing developments. Information and communication technology in education today is very important for a teacher. It can't be avoided because teachers should learn to use technology to advance learning in schools. Technology can be used
by teachers to come up with ideas in developing interesting media. So as to facilitate students' understanding of learning. By using technology today, the learning media used by teachers are also increasingly varied, which are used as tools to convey material to students.

Based on some of the expert opinions above, it can be concluded that learning media are all tools used by teachers to support learning activities. Thus, facilitating the delivery of material to students, not only that the learning media also provides reinforcement and motivation for students to take part in learning activities. Information and Communication Technology is an inseparable equivalent that contains a broad understanding of all activities related to processing, manipulating, managing and transferring information between media (Simatupang, 2018). According to Batubara (2017) Information and Communication Technology consists of three different words, namely technology, information, and communication. Technology means the application of tools, machines, materials and processes that help humans to solve problems. Information is the result of processing, manipulating and organizing a group of data that gives knowledge value to its users, while communication is a process of delivering information from one party to another so that there is a mutually influencing relationship between the two.

Budiman (2017) says that Information and Communication Technology (ICT) is all activities related to processing, manipulating, managing, and transferring information. Based on the above understanding, it can be concluded that Information and Communication Technology (ICT) is a tool that covers all parts of technology, both the use, process, and benefits obtained by the technology itself. According to Budiana et al (2015) stated that the benefits of using ICT in order to support the implementation of learning include: 1) improving the quality of learning, 2) expanding access to education and learning, 3) helping to visualize abstract ideas, 4) facilitate understanding of learning material, 5) display learning material to be more interesting, and 6) allow interaction between learning and the material being studied.

In other words, the benefits of information and communication technology are that it can help in developing student learning in an effort to achieve life skills such as communication skills, creativity, innovation, independence, and so on. So it can be concluded that the benefits of Information and Communication Technology (ICT) in learning are to simplify and create an effective and fun learning process.

2 Research Methods

The type of research used in this research is the type of research and development (R&D). Research Research and Development is the process of developing and validating educational products. Sugiyono (2013) states that Research and Development research is research that is used to produce a certain product that has been tested for the effectiveness of the product. This research was conducted in Belawan elementary school. This research was carried out in 2021.

Data collection techniques used are interviews and questionnaires. While the data analysis in this study was obtained from qualitative data and quantitative data. Qualitative data were obtained from the comments of the validators, both suggestions and criticisms contained in the questionnaire that had been given by the researcher. The suggestions and criticisms were used as material for improvement of the media developed by the researchers. Quantitative data were obtained through scoring the questionnaires that had been filled out by the validators, both material and media experts. The assessment or scoring of the questionnaire uses a Likert scale in the form of a checklist with five categories.
3 Results and Discussion

Material Expert Validation
Validation in this study was carried out in May offline or face to face with the validator. The score obtained through material experts with a feasibility percentage of 84% and is included in the "Very Eligible" criteria.

Media Expert Validation
The first stage of validation for media experts was carried out in May offline or face to face with the validator. The first validation results obtained a score of 77 with a percentage result of 77% and was included in the "Eligible" criteria. In the first stage of validation, the validator only commented that the media that the researcher developed was good, but because the results obtained were still not very feasible, the researcher made revisions to carry out stage II validation to media experts. The second phase of validation was carried out in June online because the campus was in lockdown.

As for the material for revision by the researcher before carrying out the second stage of validation, namely improving the questionnaire statement which was given a value of 3 or sufficient. After the researcher revises the media, the second stage of validation will be carried out. The score obtained in the second stage is 88 with a percentage of 88% and is included in the "Very Eligible" criteria. The comments given by the validator are that the media is good.

![Bar chart showing Media Expert Assessment results](chart.png)

**Fig.1.** Results of Phase I and II Media Expert Assessments on ICT-Based Audio Visual Learning Media

Individual Trial
The media that has been validated by material experts, media experts and teachers will then be tested on 3 elementary school students. This trial was conducted in May online via google form. The percentage of eligibility is 93.3% and is included in the "Very Eligible" criteria.
The media has been validated by material and media expert validators, then the next step is the media will be tested in small groups to class III-A students, totaling 9 students. Small group trial sampling of 9 people was based on a situation where students in class III-A only had 12 people who had cellphones, so that only they were able to help researchers carry out research. Therefore, the researchers divided the 12 people into two groups, namely 3 people for individual trials and 9 people for small group trials. The small group trial of 9 people consisted of various abilities, namely, high, medium, and low.

**Discussion**

ICT-based audio-visual learning media is a media development carried out by the researchers themselves, the process of making it has been completed. The developed media contains material for grade III elementary school students contained in the thematic book theme 7 on Technological Development, Development of Food Production Technology in learning 1. This thematic learning is in accordance with the 2013 curriculum that has been set and used by the school where the research is conducted. This learning media is edited through one application, namely Power Director which is downloaded using a cellphone.

Before editing, the researcher looked for and collected various materials that were needed in making media, be it pictures, teacher animations, and others. As the title suggests, this audio-visual learning media is in the form of a video containing grade 3 material, the initial appearance contains the title of the material according to the thematic book, then there are basic competencies, learning objectives, the content of thematic material, namely from SBdP lessons, Indonesian Language, and Mathematics and ends with the closing and editor's bio. This learning media lasts 9 minutes 31 seconds and will be packaged into a CD to be used by teachers at the school where the study is located.

Setyawan and Arumsari (2019:) argue that with the development of information technology, teachers are required to be more creative in delivering learning materials using appropriate learning methods and media so that students are able to understand what they are learning, one of which is audio-visual media, slide shows and films. If previous research developed audio-visual media for slide shows and films, the researchers developed audio-visual media in the form of video.

Tic-based or multimedia-based learning media has the advantage that it makes students more active, it also makes it easier to understand lessons independently anytime and anywhere. This is in line with the opinion of Paseleng and Arfiyani (2015) who say that multimedia-based learning media will make students more active, independent, and more attractive to students. The advantages of media developed by researchers are that it can be used anytime and anywhere. Only because audio visual video media can be stored on a mobile phone or tablet without using special tools such as a projector to display it. In addition, this audio-visual media also has material that is not only delivered verbally, but also displays pictures according to the material discussed so as to help students understand the world and their environment.

According to Fitria Ayu (2014) states that the benefits of using audio-visual media can convey learning content, because with the presence of audio which allows students to receive messages through their hearing, and visuals that allow students to capture material through sight. Similarly, in this study, the media developed was useful for conveying the content of learning materials through audio and visual, with these two elements students would focus and understand the learning material presented.

In developing the media, it must have weaknesses, but with suggestions and criticism from experts, these weaknesses are minimized by revising the product (Sugiyono, 2013). The purpose
of developing this media product is to find out whether the developed media is suitable for use in learning activities so that it is useful for students to more easily understand the lesson.

Based on the assessment of the relevance of the material, practicality, and language used in the learning media, the percentage of eligibility is 84% with very feasible criteria from material experts. While the aspects of appearance, content, and language of the learning media obtained a feasibility percentage of 77% with appropriate criteria from media experts for stage I and obtained a feasibility percentage of 88% with very feasible criteria from media experts for stage II. Furthermore, individual and small group trials were carried out in order to see the response of students whether the learning media developed by the researchers was interesting and fun to make it easier for them to understand the subject matter. The individual trial obtained a feasibility percentage of 93.3% with very good criteria, while the small group trial obtained a feasibility percentage of 91.1% with very good criteria.

4 Conclusion

Based on the results of the research and discussion above, it can be concluded that ICT-based audio-visual learning media can be said to be very feasible to be used in learning activities in elementary schools. The results obtained through the assessment of the material experts obtained a feasibility percentage of 84% with the "Very Eligible" criteria, while the media experts in the first stage obtained a feasibility percentage of 77% and were included in the Eligible criteria and there were revisions. The second validation stage carried out by media experts obtained a feasibility percentage of 88% and was included in the Very Eligible criteria. Furthermore, individual trials obtained a feasibility percentage of 93.3% with the "Very Eligible" criteria and individual trials obtained a feasibility percentage of 93.3% with the "Very Eligible" criteria. So it can be concluded that ICT-Based Audio Visual Learning Media is very feasible to be used in learning activities.

References


Three Tier Test in Analyzing the Misconceptions of Mathematics learning

Elvi Mailani¹, Umri Rahman Efendi², Suyit Ratno³
{elvimailani@unimed.ac.id}

PGSD, Faculty of Education, State University of Medan, Indonesia¹²³

Abstract. The purpose of this research is to describe how students' misconceptions about the material of flat shapes in the fourth grade of SDN 050644 Bahorok on 2020/2021. Misunderstanding of the concept or the principle will have an impact on how students' ability to understand the learning material. Formal learning is a long continuous process must start with the right concept. This research was conducted by using descriptive methods. The research was carried out in the fourth grade of SDN 050644 Bahorok. The research instrument used the three-tier test or the test with three levels. The results showed that 29% of students have misconceptions, 12% of students have false positive misconceptions, and 14% of students have false negative misconceptions.

Keywords: Misconceptions, Three Tier Test, Flat Shape.

1 Introduction

Learning occurs when there is an interaction between the individual and the environment, both the physical environment and the social environment. The learning process must be carried out effectively where learning can take place smoothly, directed, and in accordance with the learning objectives. Learning objectives are not only the assignment of subject matter, but the process of changing students' understanding in accordance with the objectives to be achieved also needs to be considered. However, the current teaching view is only limited to conveying that knowledge. The success of a teaching process is measure by the extent to which students can master the subject matter presented by the teacher.

Education is a process of preparing human resources to run the life and fulfill life goals more effectively and efficiently. Thus, we can mean the education is an effort that is deliberately made to students to improve the personality and potential possessed by students. In mathematics, students are not only required to be fast in counting, but what is equally important is how to instill mathematical concepts in students. This is important so that students are able to understand the true meaning of mathematics. Mastery of student material is often hampered due to misunderstanding of concepts or misunderstanding of principles. Initial concepts that are not in accordance with the conception of science brought by students will have an impact on the formal learning process.

Various definitions of the concept have been put forward by experts. In the Ministry of Education and Culture's online KBBI (2016) a concept is a design, idea or understanding that is abstracted
from concrete events. The term concept comes from the Latin conceptum which means something that is understood. In general, the concept can be interpreted as a general picture to interpret an idea or understanding that is abstract. Misconception is an understanding of a concept that is not in accordance with the scientific understanding accepted by experts in the field of science (Abidin et al., 2019, p. 9).

Mathematics is a universal science that underlies the development of modern technology and is important in various disciplines and is able to develop human thinking power (Ganesis and Banjarnahor, 2017, p. 59). According to Mailani (2015, p. 9) there are many misleading myths about mathematics, these false myths play a major role in making some people feel allergic or even dislike mathematics. Flat shape is a geometric shape that is flat (flat) which has two dimensions, namely length and width but does not have height and thickness.

According to the Ministry of Education and Culture's online KBBI (2016), an investigation into an event (writing, deed, and so on) to find out the actual situation (cause, situation, and so on). Students’ initial understanding is not always in accordance with existing theoretical concepts. Misconceptions will have a negative impact on the learning process. With students' misconceptions, it will be difficult to accept learning materials. Students who experience misconceptions if they are not detected will cause continuous conceptual errors. The existence of this misconception is caused by many things, both errors from the teacher, errors from learning resources, errors from learning methods, and errors from students themselves. In this case, students will find it difficult to distinguish one flat shape from another flat shape or one formula with another formula if students already have the wrong flat shape concept.

To find out the misconceptions that occur in students, we can do various ways including using concept maps, essay tests, interviews, class discussions, multiple choice, multiple choice with reasons (two tier test), to multiple choice with reasons accompanied by the level of confidence in the answers given (three tier test). The use of the three-tier test can make it easier to uncover misconceptions that occur in students well. With this test it is possible to identify the possibility of students answering by guessing, understanding concepts or the occurrence of misconceptions (Maulini et al. 2016, p. 43).

Three tier test is a test with three levels. The first tier is the usual multiple choice. The second level is the reason as reinforcement for the answer choices at the first level. The third level is the level of confidence in the answers given. From the combination of answers at these three levels, the percentage of students who understand, misconceptions, misconceptions (false positive), and misconceptions (false negative) will be obtained, the correct answer because of luck or the correct answer but not confident, and do not understand the concept.

2 Method

This research was conducted at SDN 050644 Bahorok, which is located at Jl. Ampera, Pekan Bahorok Village, Bahorok District, Langkat Regency, North Sumatra Province. This research was conducted in the even semester of the 2020/2021 academic year. This type of research is descriptive research with a qualitative approach. Qualitative research is often called a naturalistic research method because the research is carried out in natural conditions (natural settings).
Because the research principle is measurement, it is necessary to have a good measuring instrument. This measuring instrument is referred to as a research instrument. The research instrument is a tool used to measure the observed natural and social phenomena (Sugiyono, 2019, p. 146). The instrument used in this study was a test instrument in the form of 15 items of flat material. Data analysis is an effort to process data into information so that the characteristics or properties of the data can be easily understood and useful for answering problems related to research activities (Hartati, 2017, p.73). From the data obtained, the data were analyzed based on the combination of answers starting from the first level, second level and third level.

From the three tier test data, it was analyzed and calculated the percentage of misconceptions in each item. The researcher then concludes from the data obtained in the form of the results of the analysis of misconceptions that occur. For the classification criteria, the researcher refers to the classification of the results of the three-tier test according to Arslan, Cigdemoglu & Moselay (2012, pp. 1667-1686) in Istiyani, Muchyidin & Raharjo (2018, pp. 228).

<table>
<thead>
<tr>
<th>First Grade</th>
<th>Second Grade</th>
<th>Third Grade</th>
<th>Category</th>
</tr>
</thead>
<tbody>
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<td>True</td>
<td>confident</td>
<td>Understand of concept</td>
</tr>
<tr>
<td>True</td>
<td>False</td>
<td>confident</td>
<td>Misconcept (false positive)</td>
</tr>
<tr>
<td>False</td>
<td>True</td>
<td>confident</td>
<td>Misconcept (false negative)</td>
</tr>
<tr>
<td>False</td>
<td>False</td>
<td>confident</td>
<td>Misconcept</td>
</tr>
<tr>
<td>True</td>
<td>True</td>
<td>Unconfident</td>
<td>Lucky guess, lack in confidence</td>
</tr>
<tr>
<td>True</td>
<td>False</td>
<td>Unconfident</td>
<td>Lack understand of concept</td>
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<tr>
<td>False</td>
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<td>Lack understand of concept</td>
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<tr>
<td>False</td>
<td>False</td>
<td>Unconfident</td>
<td>Lack understand of concept</td>
</tr>
</tbody>
</table>

3 Result and Discussion

The three-tier diagnostic test given to the fourth-grade students of SDN 050644 Bahorok, totaling 20 people, namely 10 male students and 10 female students. From the implementation of the test, a combination of student answers was obtained on each question with three levels (three tier test). The identification results from the results of student answers, it is known that as many as 29% of students understand the concept, as many as 55% of students experience misconceptions, 2% of students answer correctly because they guess lucky or are not confident, and as many as 14% of students do not understand the concept. For the classification criteria, the researcher refers to the classification of the results of the three-tier test according to Arslan, Cigdemoglu & Moselay (2012, pp. 1667-1686) in Istiyani, Muchyidin & Raharjo (2018, pp. 228).
From the level of student understanding, it is known that 55% of students have misconceptions. The misconceptions experienced by students are divided into 3 categories, namely misconceptions (conditions when students are not right in answering questions and give inappropriate reasons as well), false positive misconceptions (conditions where students answer correctly at the first level but cannot provide appropriate scientific reasons to strengthen the answer), and false negative misconceptions (conditions when students have determined the right reason but are careless in determining the correct answer at the first level). In each question, the level of misconception experienced by students in the flat wake material is different.

This research has differences and advantages from previous relevant research, namely it can identify the occurrence of misconceptions more precisely and can be done in a more effective time. In addition, this study is able to identify misconceptions in a large number of students and can classify students' misconceptions without having to generalize to all students. The combination of answers from the three levels of the three-tier test in this study is the key in determining the level of students' understanding of the material being tested. The alternative solution presented by the researcher in this discussion is the result of a literature review that the researcher conducted on several previous relevant studies and has not yet been tested when the researcher conducts the research..
4 Conclusion

Based on the results of the research above, the following conclusions can be drawn.

a. The results of the student test with the three tier test showed that as many as 55% of the 20 fourth grade students of SD Negeri 050644 Bahorok had misconceptions.

b. Types of misconceptions experienced by students are as many as 29% of students have misconceptions, 12% are identified as having false positive misconceptions, and 14% are identified as having false negative misconceptions.

c. The misconceptions that occur in students are found in each flat material.

Acknowledgement

The author would like to thank to all of everyone who supported this research. Thanks and Hopefully that the results of this research will give much benefit to everyone who has read and use this article.

References


Field Trip Educational Tourism as A Mean
Strengthening Cultural Literature of Students in
Pematang Johar Village, Labuhan Deli District

Try Wahyu Purnomo¹ Masta Marselina Sembiring², Sri Mustika Aulia³, Erlinda
Simanungkalit⁴
{twahyu@unimed.ac.id}
Fakultas Ilmu Pendidikan Universitas Negeri Medan¹²³⁴

Abstract. This study aims to be able to develop learning facilities for students by utilizing
the potential of local tourism in Pematang Johar Village. The benefits of this research are
(1) increasing the ability and understanding of students' cultural literacy through utilizing
local potential, (2) increasing student competence in learning strategies that are integrated
with local potential, (3) Provide alternative outing class learning to students so that they
can increase the love for the homeland and nation, (4) increase product sales, increase
creativity in rural communities, and (5) community in the economic aspect as an effect
positive tourist visits. The research method uses a descriptive approach to describe the
process of implementing an educational field trip by utilizing the local potential of the
village. The conclusion from the research activities that have been going on is that the field
trip education tourism, agro-tourism, rice fields, oyster mushroom cultivation, batik and
culture (dance) are very effective in being used as a means to strengthen the cultural
literacy of Pematang Johar students.

Keywords: field trip education, cultural literacy, tourist village

1 Introduction

An educational process is not only always applied in a formal or non-formal environment
but can also be carried out through tourism activities. In the concept of education-based tourism,
the process aspect is carried out with the active involvement of tourists physically, mentally and
emotionally in the tourist objects that are followed. According to Wiwin [1] today, the level of
motivation of tourists has changed, which was originally just a desire for recreation as a physical
need, but then is more oriented towards self-esteem/development motivation, actualization and
the need for appreciation. In the North Sumatra region, there are several creative villages that
have various tourism commodities so that they can be used as public educational tourism
destinations.

BPS [2] describes Pematang Johar Village is located in Labuhan Deli District, Deli Serdang
Regency, North Sumatra with an area of about 2,217.84 hectares. Of the area, about 1,750
hectares are rice fields that function as livelihoods for local residents. Based on these data, it
can be concluded that the majority of the people of Pematang Johar Village use rice fields as
their livelihood. To answer the issue of the development of the education-based tourism sector
in the North Sumatra region, the Pematang Johar Village Government has taken the initiative to
develop the potential of rice fields to become one of the tourism commodities.
The Village Government has the idea that rice fields can not only be managed for the food needs of the community, but can also be used as a comfortable, inexpensive and educational means of learning and family recreation. Rice field tourism in Pematang Johar Village is a form of the BUMDES (Village Owned Enterprise) program and is managed directly by the community who are members of the POKDARWIS (Tourism Awareness Group) community.

Through strengthening cultural literacy by utilizing the potential of local tourism, it can certainly form students with character and love for the homeland. This study aims to be able to develop learning facilities for students by utilizing local potential at the Rice Field Tourism destination in Pematang Johar Village, North Sumatra. The benefits of this research are (1) Improving students' cultural literacy skills and understanding through the use of local potential, (2) Increasing student competence in designing learning materials and strategies that are integrated with local potential, (3) Providing students with an alternative outing class learning process so that can increase the sense of love for the homeland and nation, (4) Increase sales of products created by the village community's creativity, and (5) Improve community welfare in the economic aspect as a positive effect of high tourist visits.

2 Research Methods

This study uses a descriptive qualitative approach, namely research that aims to create a descriptive picture in the form of a clear description of the research object under study, namely the process of implementing field trip educational tourism as a means of strengthening student literacy aspects. According to Tarmizi [3] Data processing is carried out descriptively in accordance with the opinion of Moleong which states that qualitative research is descriptive, meaning that the data analyzed, and the results of the analysis will also be in the form of descriptive. Furthermore, Vredeberg in Astutik [4] states that the goal in qualitative research is to describe complex social realities in such a way, this also refers to the relationship between sociological-ethnographical relevance relationships achieved.

This study describes the process of implementing field trips starting from agro-tourism field trips, cultural arts field trips and edupreneur field trips starting from the stages of preparation, implementation, evaluation and potential outcomes of the program.

3 Result and Discussion

From the research that has been done, it can be seen that there are 4 types of field Trip Education Tourism facilities that can be used as media to strengthen the cultural literacy of Pematang Johar Students, North Sumatra, as follows:

a. Field trip activities for agro-tourism to introduce the cycle of rice cultivation. In this activity, students provide an introduction to material about the potential of rice as a staple food for Indonesian people. Students are taught theoretically about the process of planting rice starting from the stages of sowing seeds, seeding, planting seeds to harvesting rice.
Fig 1. Submission of Materials by Students Regarding the Rice Cultivation Cycle

In this activity, resource persons (Farmers in Pematang Johar Village) guided Salsa Private Junior High School students to directly practice the process of seeding and planting seeds directly.

Fig 2. Rice Planting Practice Activities by Salsa Junior High School Students

b. Field Trip Activities for oyster mushroom cultivation as an effort to optimize the village's potential as a leading commodity in Pematang Johar Village. In this activity, students play a role in providing material regarding the process of making oyster mushroom fermentation media, the nutritional content of mushrooms, and the marketing potential of oyster mushrooms as a leading commodity in Pematang Johar Village.

Fig 3. Submission of Materials by Students Regarding Mushroom Cultivation

Mushroom cultivation activities continued with the practice of making oyster mushroom fermentation media facilitated by the Rice Field Tourism Manager. This activity aims to guide students in the process of mixing the materials needed in making baglog as a medium for oyster
mushroom cultivation. Students were also introduced to F4 seeds as a medium for oyster mushroom fermentation.

**Fig. 4. The Process of Making Baglog as Oyster Mushroom Fermentation Media**

The results of making baglogs that have been made in the previous Field Trip activities then continue with the cultivation process in the Salsa Private Junior High School environment. Students, assisted by teachers, monitor the mushroom cultivation process so that later it produces mushrooms that are ready to be harvested.

**Fig. 5. Mushroom Cultivation Monitoring Activities at Salsa Junior High School**

c. The Batik Field Trip activity was carried out by providing material by students about batik as a means of strengthening cultural literacy and alternative millennial entrepreneurs. Students provide material reinforcement for various kinds of decorative potential in North Sumatra which can be developed into batik designs that have local characteristics.

**Fig. 6. Activities to Strengthen Batik Materials as Local Potential Based on Cultural Literacy**

The practice of hand-drawn batik uses canting as a means of student creativity. This activity was facilitated by the batik studio Liza Mangrove as a resource person. Salsa Private Junior
High School students are invited to be able to hone their creativity by creating batik art while getting to know various alternative decorations that can be used as batik designs.

Fig. 7. The Practice of Batik Using the Canting Technique By Liza Mangrove Batik Studio

The next activity was a Cultural Field Trip by explaining the concept of Traditional Dance as a means of strengthening students’ cultural characters. In this activity, students explained about the various ethnic groups in North Sumatra and discussed the characteristics of each ethnic group. This activity will be held on 19-20 November 2021

Fig. 8. Presentation of Materials by Students Related to Strengthening Cultural Literacy Through Introduction to Traditional Arts of North Sumatra

The next activity was the practice of dancing by Salsa Private Junior High School students as an implementation of understanding the material presented at the previous meeting. The dance practice activity was led by resource persons from the Alfhun Art Studio, Pematang Johar Village.

Fig. 9. Dancing Practice Accompanied by Alfhun Art Studio Pematang Johar Village

Based on the implementation of the above activities, the benefits and opportunities of sustainability can be seen as follows:
Educational Aspect
a. The Field Trip Educational Tourism activity is an alternative outing class activity that can be a reference for partner schools to develop students' cultural literacy skills and understanding through the utilization of local potential in the tourist destination area of Pematang Johar Village.
b. The Field Trip Educational Tourism activity is a forum for students to be able to get to know the object of the lesson directly so that it can increase students' analytical power and creativity as the goal of the Higher Order Thinking Skills aspect.
c. Student Learning Experience Activities outside campus are a means to improve student competence in designing learning materials and strategies that are integrated with local potential.

Economic Aspect
a. Field Trip Educational Tourism activities are a means to increase sales of products created by the people of Pematang Johar Village.
b. This activity can also stimulate rice field tourism managers to be able to package educational tour packages so that they can increase rice tourism income.
c. This activity can be a means to improve the welfare of the community in the economic aspect as a positive effect of the high tourist visits.

Social Aspect
a. Field Trip Educational Tourism activities as a step to empower the people of Pematang Johar Village to be able to optimize the potential of the village which has economic value.
b. Field Trip Educational Tourism activities as a means of increasing a sense of togetherness and collectivity between creative components in Pematang Johar Village so as to create an advanced Creative Village.

4 Conclusion

The conclusion from the research activities that have been going on is that the field trip education tourism, agro-tourism, rice fields, oyster mushroom cultivation, batik and culture (dance) are very effective in being used as a means to strengthen the cultural literacy of Pematang Johar students. Even though there are actually many tourism facilities based on local wisdom in Pematang Johar village, if it's just a tour without absorbing the educational elements in it, then it's just an ordinary tourist attraction.

References
Case Study of The Difficulties of Learning to Write Children Aged 5-6 Years at Integrated Islamic TK Muadjajah Kec. Lubuk Pakam FY 2020/2021

Suri Handayani Damanik¹, May Sari Lubis², Isa Hidayati³, Annisa Khairani Andini⁴

¹{suridamanik@unimed.ac.id}
¹²³ Faculty of Education, State University of Medan-Indonesia

Abstract. This study aims to determine the difficulties in learning to write in the Muadjazah Islamic Kindergarten, Kec. Lubuk Pakam. The research method used is descriptive qualitative research and the type of case study approach (case study). The subjects used in this study were 3 children in class B of the Integrated Islamic Kindergarten Muadjazah Kec. Lubuk Pakam. Data analysis techniques used in this study are data collection (data collection), data reduction (data reduction), data display (data presentation), and conclusion drawing (drawing conclusions). The findings of the study indicate that the ability to learn to write in children aged 5-6 years at the Muadjazah Islamic Kindergarten, Kec. Lubuk Pakam showed different results of children's learning to write and only one child developed better, while the other two children did not develop. Children's ability to recognize letters, hold writing tools, imitate making letters and numbers and make various shapes of lines also shows varied results.

Keywords: Writing Ability, Difficulty in Learning to Write

1 Introduction

Education is one of the most important aspects that need to be given to individuals even since they have just been born, both spiritually and physically. Education for children at an early age is the basis for the formation of a personality by playing an important role and will determine the development of children in the future era. UU no. 20 of 2003 concerning the National Education System Chapter 1 Article 1 Point 14 states that Early Childhood Education (PAUD) is an effort in terms of guidance aimed at children from the time the child is born until the age of 6 years which he does by passing the educational stimuli provided. to provide assistance regarding spiritual and physical development and growth so that children have readiness to enter education which is much more improved.

Education for early childhood is not only about giving new world introductions to children, especially in terms of academic introductions which will later be continued to the next levels. This is also related to the character education of children from an early age so that they can form superior personalities in various positive characters. The implications of this character education are not only for the personal environment and also for the child's family but are in line with the country's vision to be able to continue a superior generation.

Not based on academics, early childhood education actually has the concept of non-formal education where children can learn from their surroundings. As stated by Buchari in (I Ketut Sudarsana, 2017, p.02)[1], that what must be done, so that the non-formal education activities held really bring significant progress, namely progress that is greater than the swelling of the various problems faced, and no less rapidly than the pace of progress achieved by other countries.
According to someone named John Amos Comenius in (Anita Yus, 2011, p. 02)[2], suggests that from the moment a child is born, education has to be started. Education takes place in a natural way by paying attention to the maturity factor and providing it with the best opportunities and opportunities, due to the various sensory experiences experienced by children at an early age which are the basis of all learning. Therefore, Comenius believes that the use of books with illustrations will be very helpful in developing a child's skills and abilities. Comenius also began to emphasize how important the act of play is in the self-development of a child.

Education in Kindergarten can provide assistance to the development of various potential children, both physically and psychologically which includes morals and various religious, cognitive, physical, motor, social emotional values, language, art and independence in learning: enter basic education. One of the physical activities for a child, especially for fine motor skills, is writing. In line with that, (Shaleh, 2008, p. 162) argues that the key to the development and growth of a child is in the sentence of stimulation and stimulation. From stimulation or stimulation, one can develop and grow each of the potentials that exist within the child.

The problem of education in Indonesia cannot be taken lightly. There are still many cases of ineffective education that make many children who have graduated at a certain level but have not met the competency standards that are targeted to be achieved at their age after receiving education at a certain level. This is very unfortunate because it will be the seeds of the destruction of the generation that will continue the baton of nation building. One of them is the problem of writing skills at the level of early childhood education, which at this level should be the initial foundation for early childhood to be able to learn in the future.

At the age of Kindergarten, especially in group or group B (5 to 6 years), the ability in terms of writing children should have been at the stage of being able to write well and correctly. In Permendikbud 146 of 2014[3], a child aged 5 to 6 years has been able to master the indicators by recognizing early literacy, namely: a) showing various kinds of symbols, b) creating images with various kinds of writing and scribbles that have been in the form of symbols. words or letters, c) write various letters of his own name. However, after reviewing, there are still many children who attend early childhood education and even those who have graduated cannot write words or letters correctly. Therefore, the author conducts research or research on similar cases, namely things that can hinder early childhood writing learning in TK IT Muadjajah Kec. Lubuk Pakam.

**Characteristics of Children with Writing Difficulties**

Characteristics of learning difficulties according to the National Center for Learning Disabilities (2014, p. 4) are the position of holding writing instruments too weak or strong, difficulty in forming letters, there is inconsistency in the position of the letters on the line, there is inconsistency the distance between letters or words, difficulty in pouring ideas or ideas into writing, and the inconsistency of the shape of the size of the letters. Meanwhile, according to Yusuf in Marlina (2019, p. 134) [4] there are inconsistencies in the form of letters in writing, there is mixing of lowercase and uppercase letters, the shape of the letters written is disproportionate, children seem to try very hard in communicating ideas, knowledge, and understanding through writing, difficulty in holding a writing utensil steadily, communicating with oneself when writing, or paying too much attention to hands when writing, writing inconsistently and not following a proportional and precise line, still having difficulties even if only copying examples existing posts.

From these two references the author concludes a characteristic of writing difficulties into several points, namely difficulty holding writing instruments correctly, not remembering the letters in his own name, difficulty forming letters even though he is copying, difficulties in expressing his ideas through writing.
Types of Difficulties in Learning to Write

Based on the types of difficulties in learning to write by Yusuf (2005, p. 181)[5], the authors conclude that several types of learning difficulties in writing which will also be parameters in this study are too rigid in holding writing instruments, taking too long in writing, wrong direction in the writing of numbers or letters, the form of numbers and letters cannot be read and reversed, does not follow the horizontal line correctly, the size of the writing is too large.

Factors Causing Difficulty Learning Writing

There are various aspects that can hinder learning in terms of writing according to Freeman (2001, p. 91)[6] are: a) Interest in writing to a child has not yet emerged, b) writing activities are rarely accustomed against a child, c) the level of intelligence of a child who is completely lacking, and the infrastructure and facilities are not supportive. According to Roos, et al., (in Kosasih, 2012, p. 34)[7] difficulties in learning to write are caused by: a) an injury to the brain in the era of brain development, b) an imbalance of various kinds of chemicals that exist in the brain, the brain, c) a disturbance in the development of nerves, and d) a delay in the stages of individual development.

Hallahan, et al., (in Kosasih, 2012, p. 34)[7] also stated the factors that cause difficulties in carrying out learning activities, genetic, organic, and environmental factors. Apart from that, physical and psychological conditions as well as affective and motivational factors are also the cause of the occurrence of a child having difficulty in carrying out learning activities. Judging from the various factors that have been described above, it can be concluded that each of the treatment programs that will be given to a child who has difficulty in learning to write is different, it must be synchronous or in accordance with the aspects that cause the child in terms of experiencing learning difficulties so that each of the parents and educators does not experience an error in handling it. Apart from that, the cause of difficulties in terms of learning itself is not only from the external aspect, but also from himself independently.

2 Research Methods

Methods used is using qualitative methods. Qualitative research is research that aims to understand the phenomena experienced by research subjects (Moleong, 2007)[8]. The research used is descriptive qualitative research. This type of research is research that uses a case study methodology or approach. This research focuses itself in an intensive way on a particular object that studies it into a case. Data obtained from all related parties, therefore in this study were collected from various sources (Nawawi, 2003, p. 1)[9]. The research location was conducted at the IT Muadzjah Kindergarten, Lubuk Pakam District, Deli Serdang Regency, North Sumatra from June to August 2021.

The research subjects were three students from the kindergarten. Data collection techniques used are interviews, observation, and documentation. There are three stages in this research, namely the preparation, implementation and final stages. In the preparation stage, the researcher visited the research location to apply for a research permit, then met the B1 and B2 class teachers as a pre-research step. In this preparatory stage, the researcher also begins to prepare the research instrument that will be used.

At the implementation stage, the researcher conducted observation of subject data through files owned by educators. After that, the researcher collected the required data through four meetings. The final stage is the intensive analysis stage. The researcher collects portfolio data on learning to write, identity documents (children's photos and child identities), and checklist sheets for writing activities. From all the data and analysis obtained, the researcher draws a conclusion.
3 Results and Discussion

This study used three students who had difficulties in learning to write and were aged 5-6 years. The three children are Nauzan, Naifa, and Kezya. Collecting data from the three subjects used several techniques such as observation or observation techniques, interviews, and documentation. There are three types of problems identified in this study, namely children who are only able to cross out, children who have not been able to write, copy, imitate, and thicken letters or numbers well, and children's writing that is difficult for teachers to read.

First, the problem of children who are only able to cross out is indicated in Nauzan and Dilla. The research findings regarding the difficulty of learning to write Nauzan are at the stage of the first writing ability, namely the stage of crossing out. The results of Nauzan's writing at school, home and tutoring centers are in the form of lines and circles in various writing activities. Many efforts have been made by parents, schoolteachers and tutors in tutoring centers to develop Nauzan's writing skills, but his writing skills are still at the scratching stage. However, Nauzan always shows high enthusiasm to complete every job given by the teacher.

In addition, Nauzan also never complains when given a lot of work in terms of writing. Various efforts have been made by Nauzan's parents and teachers to help develop Nauzan's writing skills, but these abilities are still the same as before, which is still at the crossing out stage. Nauzan can only write lines and circles for all writing activities carried out. The research finding regarding Naifa's writing difficulties is that she is at the first writing ability stage, which is the crossing out stage. Naifa's writings at school, home and tutoring centers are in the form of lines and circles in various writing activities. There have been many ways and efforts that have been made by parents, schoolteachers and tutors at tutoring centers to develop Naifa's writing skills, but her writing skills are still at the crossing out stage. Various efforts have been made by Naifa's parents and teachers to help develop Naifa's writing skills, but these abilities are still the same as before, which is still in the crossing out stage. Naifa can only write lines and circles for all her writing activities.

Second, in the problem of children who have not been able to write, copy, imitate, and thicken letters or numbers well, there are indications on the subject of Nauzan and Dilla. The difficulties faced by Nauzan when learning to write that the researchers found were that Nauzan had not been able to hold a pencil properly, copy writing, thicken letters or numbers, thicken and imitate writing, coloring and it was difficult to understand commands and it was difficult to express the obstacles experienced at the time of writing. learn to write. In addition, for psychomotor abilities, social-emotional and other languages are also still experiencing difficulties.

However, Nauzan memorized and could say the letters AZ, numbers 1-10 and the letters hijaiah although in a less clear voice. The difficulties faced by Naifa are not much different from those of Nauzan, the researchers found that the difficulties faced by Naifa were that Naifa had not been able to hold a pencil properly, copy writing, bold letters or numbers, and imitated writing, coloring and it was difficult to understand commands and difficult to express obstacles experienced when learning to write. In addition, other cognitive, psychomotor, religious, socio-emotional and language abilities are also still experiencing difficulties.

Finally, there is the problem of children's writing which is difficult for teachers to read. This problem was identified from the subject of Keyza. The difficulties faced by Keyza when learning to write that the researchers found were that Keyza still had difficulty distinguishing the letter 'b' and the letter 'd', the letter 'n' and 'm', and the shape and size of the letters were inconsistent in the writing. In addition, other cognitive, psychomotor, religious, and language abilities still have difficulties. Keyza finds it difficult to digest the information given by the teacher. For example, when given an assignment by the teacher, Keyza just kept quiet while looking at his friend and also followed what his friend was doing. Keyza is also difficult to express the obstacles he faces.
Based on the picture, the way Nauzan, Naifa, and Keyza is with the pencil angle is too big. In addition, they are also too strong in holding the pencil when writing. Even when they write, they put too much pressure on the pencil on the worksheet so that the pencil often breaks and the writing leaves marks on the next sheet. The use of carbon paper, drawing between two lines and using a three-lined book in the learning process during the researcher's research has never been done by the teacher. The activity that is often done is imitating the writing and thickening the image of the connecting dots. The teacher also provides verbal assistance when they are learning to write by saying instructions such as “up”, “down”, “turn”, “stop”. Not only that, but the teacher must also provide stimulation, motivation, enthusiasm and also praise for everything that is done by children. Regardless of the form of writing that has been done, children have the right to get praise. It is not only anger and threats that are given so that children experience pressure and eventually become lazy to write again.

Based on the results of research conducted by researchers in the teaching and learning process, teachers only carry out several activities that are used to help Nauzan, Naifa and Keyza in developing their writing skills which are considered easy, practical, efficient and not troublesome. In addition, not all teachers do the same with. There are teachers who do not care at all about the writing ability of the three children. Teachers should have to do these activities because soon they will continue their education to elementary school. In activities using the blackboard, children are not given the freedom to use the blackboard. The teacher does not give the children the opportunity to write the day and date and the answers to the questions the teacher gives them on the blackboard. The teacher only asks questions and provides opportunities for children to answer, not answers and writes answers on the blackboard.

In addition to the blackboard, there are many other materials that can be used to practice writing movements that include fine and gross motor skills that are not used by teachers. The purpose of using these other materials is to practice writing movements which are closely related to fine motor maturity and eye-hand coordination. The writing position, the position of the paper, and the way the child holds
the pencil are also less noticed by the teacher. The teacher only gives instructions to the children to sit in their respective chairs and do the task until it is finished.

4 Conclusion

Based on the research findings and discussions that have been described in the previous chapter regarding the difficulties in learning to write for children aged 5-6 years at the Muadzah Islamic Kindergarten, Kec. Lubuk Pakam, it can be concluded that the results of data analysis showed that only one of the three children had developed writing skills, while two of them showed that their writing skills had not yet developed. The ability of children to recognize letters and numbers can be seen that two of them can mention the symbols of letters and numbers, while one of them can mention but with the help of the teacher. One of the children's abilities to hold writing utensils has started well, while two of them have not been able to hold writing utensils properly. The ability of children in imitating letters and numbers is only one of them who is able to do it while two of them have not been able to do it. Only one of them can do it, while two of them have not been able to do it.

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Finally, as a researcher I would like to thank all those who have supported this research, especially for the supervisors who are willing to provide direction and guidance for me to be able to carry out this research. Also, to family and friends who have supported morally and financially. Hopefully this research article can be useful for readers.

References

Development Of Assessment Instrument Based on Higher Order Thinking Skill (HOTS) To Improve Critical Thinking for Class XI IPS At Sultan Iskandar Muda Private High School Medan for the 2020/2021 Academic Year

Darto Paulus Simanihuruk¹, Indra Maipita², Dede Ruslan³
{dartopm01@gmail.com}

Program Studi Pendidikan Ekonomi, Program Pascasarjana Universitas Negeri Medan¹²³

Abstract. The aim of this research is HOTS-based questions to improve students' critical thinking was developed through the Borg and Gall development model. The results of the material expert validation have an average score of 91 percent in the very good category and the evaluation expert validation has an average of 90 percent in the very good category, teacher response validation scores 93 percent in the very good category, and student response validation scores 95 percent are in the very good category. The effectiveness of HOTS-based questions with the interpretation of the n-gain score category for the experimental group of 52.2% is in the less effective category, while the control group is 28% in the ineffective category. Therefore, HOTS-based questions are considered less effective in improving students' critical thinking in economics subjects.

Keywords: Assessment Instruments, HOTS, Critical Thinking

1 Introduction

Assessment is the evaluation and results of the study of information to determine the achievement of student learning outcomes (Suwartini, Samsi Haryanto, 2017). In conducting evaluations, educators need to make a study of good questions to test the ability of knowledge, attitudes and skills. The results of the evaluation carried out will have an impact in making a decision. That is, the results of the evaluation will provide a better picture of students with their achievements in learning. In the 2013 curriculum, students are required to have the ability to think highly through the learning process and evaluation of learning, for example in working on assessment instruments that are HOTS.

Meanwhile, teachers are required to be able to develop assessment instruments in the form of better and good quality HOTS so that they can be used as good references in evaluating learning. Assessment instruments not only evaluate students' abilities but can improve students' critical thinking. One approach taken is to develop questions that contain high reasoning, namely between C4 to C6. HOTS-oriented assessment instruments are a necessity in today's education world. In the world of education, HOTS thinking is more emphasized in working on questions that are able to train students' thinking patterns such as problem solving, criticizing, and improving children's abilities to this level. HOTS is very closely related to the current education curriculum in Indonesia.

So far, schools are still using the K13 curriculum which aims to produce people who are great, critical, innovative and have extraordinary creativity in learning. From the findings, according to the development rules, studies from students at the research site showed that students were not familiar with HOTS abilities, for example working on more difficult questions with full analysis. In fact, students tend to prefer to work on questions that are easier and easier to solve. Therefore, they are not used to it and do not excite children's interest in learning. Students are happier with instant answers from the internet without thinking, only attaching importance to high grades from the teacher without understanding the essence of the learning objectives.

Meanwhile, teachers are only used to making easy questions, not following the rules for making good and quality assessment instruments such as semester exam questions in economics subjects. Where the questions that have been made have not included a question grid and do not include a description score. Furthermore, the researcher analyzed the midterm exam questions made by the teacher based on the results of the state's questions. It was found that 70 percent was invalid, 76.6 percent was bad questions and 46.7 percent was easy category questions. Based on these problems, researchers are interested and need to develop good and quality HOTS-based assessment instruments to improve students' critical thinking.
Assessment Instrument

The assessment instrument is a tool to measure how well students have improved their learning based on standards (Mangiante, 2013: 222). According to Suryani (2015: 457), an assessment instrument is an assessment tool that will be used by educators to assess the achievement of students through test and non-test techniques. Meanwhile, according to Amirono and Dariyanto (2016), the assessment technique is divided into two forms of tests, namely tests and non-tests. The test is a tool to measure students’ abilities in the form of questions, orders or instructions according to the learning objectives, while non-tests are measurements to get results from the form of student behavior. Thus, it can be concluded that an assessment instrument is a tool used to measure the ability of students to achieve learning competencies through tests and non-tests.

According to Matondang (2019), the requirements for quality assessment instruments must be valid, reliable, relevant, representative, practical, economical and have a level of difficulty. According to Arifin (Sofa, 2019), the requirements for quality assessment instruments must be valid, reliable, relevant, representative, practical, discriminatory, specific, and proportional. Meanwhile, Sudijono (2013) states that the requirements of a good assessment instrument are valid, reliable, practical, easy to measure, and easy to administer. Thus, it can be concluded that the requirements for quality assessment instruments are valid, reliable, relevant, representative, practical, proportional, sustainable, and meaningful which can provide an overview and feedback in learning.

The Development of Assessment Instruments Based on HOTS

According to Thomas & Thome, HOTS is a higher way of thinking than memorizing facts, expressing opinions, or applying rules, formulas, and procedures when solving problems (Nugroho, 2018:16). HOTS is a kind of thinking process that involves psychological activities, trying to explore complex, reflective and creative experiences, these experiences are carried out consciously to achieve the goal of acquiring knowledge including analysis, synthesis and evaluation of thinking levels. Rofiah et al., 2013: 17). Meanwhile, according to Resnick, HOTS is a complex thought process that involves the most basic mental activities, including describing material, drawing conclusions, building representations, analyzing, and establishing relationships (Ariyana et al., 2018). It can be concluded that HOTS are higher thinking skills such as reasoning, analytical skills, problem solving, critical thinking and doing based on facts.

In developing the assessment instrument, Anderson & Krathwohl followed the cognitive process, namely for the LOTS question categories between C1 (remembering), C2 (understanding), C3 (applying), while the HOTS question categories were among C4 (analyzing), C5 (evaluating), C6 (creating). According to Widana (Rodiana & Pahlevi, 2020) the steps to develop a HOTS-based assessment instrument include several steps, namely (1) analyzing basic competencies and indicators to make HOTS questions, (2) creating a grid of questions, (3) using a stimulus that interesting and contextual, (4) writing questions according to the grid, (5) making scoring guidelines and rules and answer keys. Meanwhile, according to Mardapi (Arifin, 2018) the steps in developing the HOTS question instrument include (1) compiling test specifications, (2) writing test questions, (3) studying test questions, (4) conducting test trials, (5) analyzing items questions, (6) improve the test, (7) assemble the test, (8) administer the test, (9) interpret the test results. It can be concluded that the main steps in developing the test in this study are analyzing core competencies and basic competencies for the test, then formulating clear instructional goals that will be assessed, making a grid or blueprint for assessment tools, making question cards, then the questions are reviewed by experts and instruments ready to be tested.

Definition of Critical Thinking

Critical thinking ability is thinking that is capable of high reasoning, reasonable, reflective and able to determine what is done and believed. This pattern of thinking is very important in the current era of education as a necessity in the future. Critical thinking aspect is one part of higher order thinking analysis (HOTS) which can shape students' mindset. In line with Ennis' opinion, critical thinking is a thinking process that analyzes, formulates, or solves problems with reasonable decisions about something. Therefore, it can be concluded that critical thinking is a student's way of thinking in determining something, formulating, and analyzing a problem critically and reliably.

Becoming a critical thinker requires awareness and skills in following the steps of critical thinking properly and correctly, although this step is not a full benchmark in improving critical thinking. The steps for critical thinking are recognizing problems, assessing relevant information correctly, being able to solve problems and drawing conclusions. While the indicators distributed to students in the form of a questionnaire as a benchmark for critical thinking according to Carole Wade are:

a. Activities to formulate questions
b. Limiting a problem
c. Testing the data
d. Analyze various opinions
Avoid emotional considerations

Interpretation in various ways

Tolerance and ambiguity

Economics Learning Materials

The economics subject matter is in accordance with the basic competencies in the 2013 revised 2018 curriculum of economics subject syllabus, class XI IPS semester two containing LOTS:

3.6 Analysing APBN and APBD in economic development.
3.7 Analysing taxation in economic development.
3.8 Describe international economic cooperation.
3.9 Analysing international trade concepts and policies

While the basic competency analysis for HOTS questions is based on basic competencies in accordance with the syllabus for economic subjects in the 2013 revised 2018 curriculum, class XI IPS semester two containing HOTS:

3.6 Analysing APBN and APBD in economic development.
3.7 Analysing taxation in economic development.
3.9 Analysing international trade concepts and policies

2 Research Methods

Development research using the Borg and Gall model with HOTS-based questions on economics class XI social studies. The purpose of this research is to meet whether or not the questions developed are based on HOTS and to find out whether the product is effective or not to improve students' critical thinking patterns. The research was carried out in the even semester of the 2020/2021 academic year. The technique of collecting data was through observation and validation questionnaires, evaluation experts and material expert validation, teacher response questionnaires, and student response questionnaires and following the stages of Borg and Gall development research. After the product is finished, then experimental research is carried out with a sample of 41 students of class XI IPS1 as the control class, and 42 students of class XI IPS2 as the experimental class. The purpose of this study is to improve students' critical thinking in economics learning by using HOTS-based assessment instruments.

3 Result and Discussion

The development of HOTS-based questions to improve students' critical thinking was developed through the Borg and Gall development model by following each development stage. In the results of the study conducted by the author, he first analysed the information according to the needs in the field. Based on the analysis of the needs of teachers and students, it was found that it was necessary to develop good and quality HOTS-based questions in accordance with the development procedure. Furthermore, the design is carried out in developing the product, starting from the stage of analysing basic competencies and indicators for each economic lesson in class XI IPS according to the economics syllabus.

After that, design the test grid to be made and the selection of indicators that meet the HOTS and LOTS questions. For the HOTS questions, there are 20 multiple choice questions covering C4 to C6 and the LOTS questions are 20 multiple choice questions covering C1 to C3. After the questions are designed and developed to the stage of question cards. Furthermore, the product can be given to the validator to review each instrument made in the form of suggestions, input or improvements. There are two validators in this study, namely material expert validation and evaluation expert validation. The results of the study from the validation of material experts related to the products developed had an average score of 91 percent in the very good category. And the validator provides suggestions and input in the form of learning objectives to be included in the question card.

Furthermore, the results of the evaluation expert validation related to the products developed have an average of 90 percent in the very good category, with suggestions and inputs given, namely the questions must contain factual data and are in accordance with the realities of everyday life. The small field test stage in the form of validating teacher responses related to the products developed had an average score of 93 percent in the very good category and did not provide suggestions or input. And the validation of student responses related to the product developed had a score of 95 percent in the very good category and there were no student input and suggestions. In a large group test involving a sample of 40 students to find out the results of the quantitative validation, including
validity and reliability tests, differentiating power tests, and testing the level of difficulty of each question. From the analysis of the questions, it was found that the results of the validity test of all questions were in the valid category with the assumption that the r-count was greater than the r-table, which was 0.312.

The results of the reliability test with an average of 0.90 are in very high criteria, the results of the average difficulty level test are in the medium category, and the differentiating power of the questions in the criteria is very good. After going through the large group test stage, so that the questions developed meet the elements of eligibility for HOTS-based questions on economics subjects for class XI Social Sciences that are good and of good quality which are ready to be distributed to students with a product of 20 multiple choice questions. In line with the large group test, the critical thinking questionnaire was first carried out by field testing to determine the feasibility of the instrument. The results of the critical thinking questionnaire test with 20 statements with a 5-point Likert scale are in the valid category.

From experimental research using pretest and posttest. For the pretest, the critical thinking questionnaire was first distributed to the two samples to determine the results of temporary critical thinking skills, then different treatment was given to the experimental class (XI IPS2) on HOTS questions and the control class (XI IPS1) on LOTS questions. The results of the pretest and posttest can be presented in the table below:

Table 1. Pre-test and Post-test Results

<table>
<thead>
<tr>
<th>Class</th>
<th>Average Pretest</th>
<th>Average Posttest</th>
<th>N-Gain Score(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment Class</td>
<td>61</td>
<td>83</td>
<td>52.2</td>
</tr>
<tr>
<td>(XI IPS2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Class</td>
<td>60</td>
<td>73</td>
<td>28</td>
</tr>
<tr>
<td>(XI IPS1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From table 1 above, the results of the experimental class pretest with an average score of 61 while the control class average score of 60. From the two samples, the students' critical thinking at the beginning was not much different for the two classes, both the experimental class and the control class. The results of the posttest with different treatments found the results that the experimental class had an average score of 83 and the control class had an average score of 72. Therefore, it can be seen that the comparison shows that the treatment, namely students who received HOTS questions had higher critical thinking scores than students with LOTS questions.

Furthermore, the normality test can be tested using the Kolmogorov-Smirnov technique, the data is declared normal if the probability value or sig > 0.05. The results of the normality test are presented in table 2 below:

Table 2. Normality Test

<table>
<thead>
<tr>
<th>Class</th>
<th>Data</th>
<th>Sig</th>
<th>α</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>0.200</td>
<td>0.05</td>
<td>Normal Distributed Data</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>0.148</td>
<td>0.05</td>
<td>Normal Distributed Data</td>
</tr>
<tr>
<td></td>
<td>Pretest</td>
<td>0.200</td>
<td>0.05</td>
<td>Normal Distributed Data</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>0.200</td>
<td>0.05</td>
<td>Normal Distributed Data</td>
</tr>
</tbody>
</table>

The normality test data for the pretest and posttest of the experimental group and the control group have a probability value > 0.05, namely, the data is normally distributed. Furthermore, a homogeneity test was conducted to determine whether the two groups of experimental and control pretest samples had the same variance value or not. It is said to have the same variance value if the sig level is > 0.05. The results of the homogeneity test are presented in table 3 below:

Table 3. Homogeneity Test

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.912</td>
<td>3</td>
<td>156</td>
<td>.130</td>
</tr>
</tbody>
</table>

The results of the homogeneity test using the Levene method, the significance value of the experimental and control posttest results is a sig value of 0.130 > 0.05, so it can be concluded that the two samples of the experimental and control groups are homogeneous. To determine the effectiveness of the HOTS-based assessment instrument, it can be calculated by interpreting the n-gain score category for the experimental group, 52.2% is in the less effective category. This is like Widya stated in her research (2019) that the HOTS assessment instrument to improve critical thinking skills is in the less effective category, which is an average of 45.6 percent on a scale of 100.
While the control group is 28% in the category ineffective. Therefore, HOTS-based questions are considered less effective in improving students’ critical thinking in economics subjects.

4 Conclusion

a. The development of HOTS-based questions to improve students' critical thinking was developed through the Borg and Gall development model. The results of the material expert validation have an average score of 91 percent in the very good category and the evaluation expert validation has an average of 90 percent in the very good category, teacher response validation scores 93 percent in the very good category, and student response validation scores 95 percent are in the very good category.

b. The effectiveness of HOTS-based questions with the interpretation of the n-gain score category for the experimental group of 52.2% is in the less effective category, while the control group is 28% in the ineffective category. Therefore, HOTS-based questions are considered less effective in improving students' critical thinking in economics subjects.

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Analysis of the Impact of Online Learning on Cognitive Ability of Children Aged 5-6 Years in Nafiri Kasih Kindergarten Sibuntuon

Dorlince Simatupang¹, Srinahyanti², Rizki Ramadhani³, Purnama R Sihombing⁴
{dorlince@unimed.ac.id¹}
Faculty Of Education, Universitas Negeri Medan¹²³⁴

Abstract. This research was executed with the purpose of understanding the effect of online learning on the cognitive competencies of student elderly five until six years. Information were collected using interview data series technique and interview. The validity of the data is checked through triangulation of methods and sources. The consequences confirmed the cognitive skills of youngsters at Nafiri Kasih Kindergarten for the duration of the net studying pandemic in phrases of citing, including and subtracting simple, bringing up, grouping, sorting objects based on shape, shade and length. The fulfillment of children's cognitive development at this school has decreased because teachers continually try to supply obligations to students that are able to stimulate children's cognitive competencies.

Keywords: online learning, cognitive, abilities

1 Introduction

According to Sujiono (2013, p. 53) childhood is the golden age, where physical, motor, social-emotional, cognitive and language growth and development take place rapidly. Growth and development starts from birth, even since the child is still in the womb. All aspects of child development develop rapidly in early childhood, so proper stimulation and learning are needed for optimal child growth. The results of research conducted by Dr Benjamin S. Bloom, Professor of Education, University of Chaigo revealed that at the age of 4 years 50% of a child's intelligence competencies have been formed. Children's intelligence at the age of 8 years has reached 80% and at the age of 18 the child's adult intelligence has been completely formed (Unizah, 2017). After the Covid-19 pandemic, direct learning was replaced with online learning. This is done to break the chain of transmission of the virus. The Coronavirus Disease (Covid-19) pandemic that hit several countries including Indonesia in early 2020, in order to prevent the spread of transmission, the Ministry of Education and Culture (Kemendikbud) issued a circular regarding the prevention and handling of Covid-19. First, Circular Number 2 of 2020 concerning Prevention and Handling of Covid-19 in the Ministry of Education and Culture. Second, Circular Number 3 of 2020 concerning the prevention of Covid-19 in Education Units. Third, circular letter Number 4 of 2020 concerning the Implementation of Education policies in the Emergency Period for the Spread of Coronavirus Disease, which among other things contains directions regarding the learning process from home.
2 Research Methods

The short of research used in this research is descriptive research with a qualitative method. In descriptive research, the researcher does not provide treatment, manipulation or change to the variables studied, but describes a condition that takes place within the area.

The research was conducted at Nafiri Kasih Sibuntuon Kindergarten which is located on Jl. Toruan Sibuntuon Village, Hamlet II, Kec. Uluan, Kab. Toba, Prov. North Sumatra. The research starts on May 03, 2021 until July 02, 2021 through the initial stages, namely visiting the research site directly

Data collection with interview and observation techniques.

Online learning at Nafiri Kasih Kindergarten has been implemented after the Covid Pandemic began to enter the red zone, but when the principal and educators saw that most aspects of child development were declining, therefore, the school implemented face-to-face learning for 2 days a week, Monday and Tuesday. When face-to-face learning is implemented, schools also reduce children's learning hours, which used to be 4 hours, now only 3 hours. This face-to-face learning always applies health protocols, such as washing hands, wearing masks, and keeping a distance. Based on the results of research and data analysis on the impact of online learning on student’s cognitive competencies at this school, it can be concluded that the cognitive development of Kindergarten students during online learning is in terms of the competency to sort and pronounce numbers one until twenty, adding and subtracting simple numbers, grouping, sorting and naming objects based on color, size and shape are included in the capable and moderately capable categories. The achievement of cognitive competencies of Kindergarten student is categorized as capable and quite capable because educators always give assignments online and the school makes breakthroughs so that children can go to school. Parents also still want to give their time to teach their children even though sometimes there are parents who don't teach their children at all at certain times because their parents are tired and busy working.

3 Result and Discussion

The effect of the online learning on kid's cognitive competencies is that there are a few parents who do now not guide or participate in children's learning. students do not do the assignments given by the trainer because there may be no parental steerage, youngsters feel bored and every now and then aren't interested by getting to know this makes kid's cognitive talents less properly evolved.

Online learning at Nafiri Kasih Kindergarten has been implemented after the Covid Pandemic began to enter the red zone, but when the principal and educators saw that most aspects of child development were declining, therefore, the school implemented face-to-face learning for 2 days a week, Monday and Tuesday. When face-to-face learning is implemented, schools also reduce children's learning hours, which used to be 4 hours, now only 3 hours. This face-to-face learning always applies health protocols, such as washing hands, wearing masks, and keeping a distance.

Based on the results of research and data analysis on the impact of online learning on children's cognitive abilities in Nafiri Kasih Sibuntuon Kindergarten, Toba Regency, it can be concluded that the cognitive development of Nafiri Kasih Kindergarten students during online
learning is in terms of the ability to sort and pronounce numbers 1-20, adding and subtracting simple numbers, grouping, sorting and naming objects based on color, size and shape are included in the capable and moderately capable categories.

The achievement of cognitive abilities of Nafiri Kasih Kindergarten children is categorized as capable and quite capable because educators always give assignments online and the school makes breakthroughs so that children can go to sokaah even though in the midst of the current Covid pandemic. Parents also still want to give their time to teach their children even though sometimes there are parents who don't teach their children at all at certain times because their parents are tired and busy working.

The impact of the online learning system on children's cognitive abilities is that there are some parents who do not support or participate in children's learning. Students do not do the assignments given by the teacher because there is no parental guidance, children feel bored and sometimes are not interested in learning this makes children's cognitive abilities less well developed.

In the development of cognitive aspects, there are factors that can affect children's cognitive abilities, namely family and school environmental factors. Supporting factors in children's cognitive development, namely the environment, a good family environment will support children's cognitive abilities and a good school environment will also support children's cognitive abilities. Therefore, teachers and parents must provide appropriate stimulus and teaching to children.

4 Conclusion

The cognitive competency of children during online learning decreases. Children prefer to study at school because children can meet their friends, teachers and can play while learning. At school, children can learn directly with their friends, children are more concentrated when their teacher gives lessons to them and children can ask friends when they miss learning activities.

Acknowledgement

The researcher would like to thank all the supporters for the occurrence of this research. I hope this research can be useful in scientific development

References

Learning Media Development Using the Lectora Inspire Application Refers to the 2013 Curriculum for Elementary School Students

Irsan¹, Elvi Mailani², Lala Jelita Ananda³, Friska Lestari Nainggolan⁴
{rangkuti23@gmail.com}

Faculty of Education, Universitas Negeri Medan-Indonesia¹²³

Abstract. The purpose of this study was to determine the feasibility of learning media using Lectora Inspire on the sub-theme of Animal Movement Organs. The subjects in this study were fifth grade of elementary school students. The results showed that the learning media using Lectora Inspire which was developed was classified as “Very Good” learning media criteria based on the results of the assessments of the three validators in the “Very Valid” category with details of the material expert validators obtained a score with an average of 95% very valid categories. In the aspect of media assessment by media experts, a score of 93.75% was obtained in the very valid category. In the aspect of language assessment by linguists, a score of 96.66% was obtained in the very valid category and the teacher response assessment aspect by the second-grade teacher was obtained with an average score of 97.61% in the very valid category. Based on the results of the three validations, the learning media using the Lectora Inspire Application on the sub-theme of Animal Movement Organs is appropriate for fifth grade elementary school students.

Keywords : Learning Media Development, Lectora Inspire, Elementary school students.

1 Introduction

Learning media is a means that can be used in the learning process to increase student motivation and learning outcomes and assist students in achieving learning objectives. Media has a role as an inseparable part of the teaching and learning process for the creation of learning objectives. Utilization of appropriate learning media can foster interest in learning, and even improve student learning outcomes.

Based on the results of interviews conducted by researchers at SD Negeri 066046 Perumnas Helvetia Medan, the teacher said that during learning the teacher had used learning media, but what was often used was pictures. As time goes by, teachers are required to be more creative and innovative in developing learning in the classroom. The teacher also conveyed some of the difficulties experienced, including the very limited availability of digital-based learning media, while at the current online learning period related to the limitations of face-to-face learning, learning media in digital form is very much needed.

Furthermore, the researchers tried to provide alternative solutions to solve the problem by developing learning media in the form of audio-visual learning media based on Lectora Inspire referring to the 2013 curriculum theme 1 sub theme 1 learning 2 for class V SD Negeri 066046 Perumnas Helvetia Medan. Therefore, the researchers compiled development research entitled...
The purpose of this research is to find out:

a. The validity of learning media based on Lectora Inspire Sub-theme of Animal Movement Organs Class V SDN 066046 Academic Year 2020/2021 Perumnas Helvetia Medan?.

b. Practicality of learning media based on Lectora Inspire Sub-theme of Animal Movement Organs Class V SDN 066046 Academic Year 2020/2021 Perumnas Helvetia Medan?

c. The effectiveness of learning media based on Lectora Inspire Sub-theme of Animal Movement Organs Class V SDN 066046 Academic Year 2020/2021 Perumnas Helvetia Medan?

2 Research Methods

This research is a type of 4D model Research & Development which consists of four stages, namely: (1) Define, (2) Design, (3) Development, and (4) Disseminate. In this study, what will be developed is learning media in the form of a Lectora Inspire-based Learning Media application in the Sub-Theme of Animal Movement Organs for Class V Elementary School students.

In this study, the researcher also uses a cooperative learning model of Example non Example. The research was conducted at SD Negeri 066046 Jl. Kamboja Raya, Medan Helvetia District, Medan with the research subject being class V Semester II students for the 2020/2021 Academic Year, totaling 30 students, consisting of 14 female students, and 16 male students. The time of the research was carried out in March-May 2021.

The following is the main flowchart of the Thiagarajan development model:

![Thiagarajan Research and Development Steps](image)

In this study, the data taken are as follows:

a. The results of research on the feasibility aspect of Lectora Inspire-based learning media obtained from media experts, material experts, and linguists.

b. The results of the questionnaire on the practical aspect obtained from the fifth-grade teacher of SD Negeri 066046 Perumnas Helvetia Medan.

c. In addition, interviews were also conducted with fifth grade teachers regarding the effectiveness of using Lectora Inspire-based learning media in supporting the learning process.

3 Result and Discussion

Development research is research that is used to produce certain products and test the effectiveness of these products (Sugiyono, 2017: 407). The product produced in this study is a Lectora Inspire-based learning media that can help students understand the complex material
for the Sub-theme of Animal Movement Organs. The development of Lectora-based media inspires learning on the problems found by researchers when collecting information in the field, namely students still find it difficult to understand the material for the sub-theme of the organs of motion in the midst of bold learning that is implemented and the availability of digital learning media in schools. So that researchers need to develop learning media based on Lectora Inspire to help students understand the material for the sub-theme of Animal Movement Organs more easily.

The steps for developing Lectora Inspire-based learning media are based on Thiagarajan's research and development procedure which consists of 4 stages. However, this research was only carried out with 3 stages of development, namely: 1) Define, 2) Design, and 3) Development. The researcher did not carry out the dissemination stage due to the limitation of face-to-face learning due to the Covid-19 pandemic, so that teaching and learning activities are carried out online from home. This causes researchers to not be able to carry out research directly to students.

In the Define stage, the researcher conducted interviews with the fifth-grade teacher at SD Negeri 066046 Perumnas Helvetia Medan, it was found that the teacher really needed the media as a learning aid for students when the learning process took place both in offline learning and even in the midst of online learning that was enforced when this. Furthermore, in the media needs analysis that teachers have difficulty in using learning media due to limited costs, time, and also school facilities that do not support it.

So that teachers use less media during the learning process. Researchers develop learning media based on Lectora inspire which is designed according to the following basic competencies and material indicators:

Table 1. Basic Competencies and Indicator

<table>
<thead>
<tr>
<th>No.</th>
<th>Competency</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Determining the main idea in spoken and written texts.</td>
<td>3.1.1 Listening to spoken texts read by the teacher.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.1.2 Find the main idea based on the text you hear.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.1.3 Read the main idea based on the text made.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.1.4 Find the main idea based on the text read.</td>
</tr>
<tr>
<td>4.1</td>
<td>Presenting the results of the identification of main ideas in written and oral texts orally, in writing, and visually.</td>
<td>4.1.1 Summarize the main idea orally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.1.2 Describe the main idea in writing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.1.3 Visualize the main idea of the text into pictures.</td>
</tr>
</tbody>
</table>

Table 2. Subjects : IPA (Ilmu Pengetahuan Alam)

<table>
<thead>
<tr>
<th>No.</th>
<th>Competency</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Explain the means of locomotion and their functions in animals and humans as well as how to maintain the health of the human locomotion</td>
<td>3.1.1 State the organs of motion and their functions in animals.</td>
</tr>
</tbody>
</table>
Make simple models of human and animal locomotion

<table>
<thead>
<tr>
<th>No.</th>
<th>Competency</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Understanding story images</td>
<td>3.1.1 Telling the story contained in the picture story.</td>
</tr>
<tr>
<td>4.1</td>
<td>Create story pictures</td>
<td>4.1.1 Making arrangements and series of story pictures.</td>
</tr>
</tbody>
</table>

The second stage is Design, which is making a defined product design. There are three steps that must be done at this stage, namely media selection, format selection, and initial design.

a. Media Selection
Selecting learning media in accordance with the analysis at the define stage. At this stage the researchers decided to choose to develop a Lectora Inspire-based learning media related to the sub-theme of Animal Movement Organs, namely Lectora Inspire-based learning media.

b. Preliminary Design
In the initial design stage, the initial product design is carried out from pre-selected learning media, namely Lectora Inspire-based learning media.

Researchers made the initial design of the media using the Adobe Photoshop application, which is an application that can be downloaded on a computer. The results of the design of learning media at this stage are the design of instructional media based on expert advice from the validator and suggestions from second grade elementary school teachers who previously had interviews. The third stage is Development. Lectora inspire learning media is made by selecting the display and audio design that will be placed as the background on the media. Lectora inspire-based learning media, which initially was only an application with several features, will then be developed into a unified concept of interesting interactive learning media. This interactive learning media is an inspiration for researchers in developing this media to help students understand the concept of the material for the sub-theme of Animal Movement Organs which is broken down into vertebrate and invertebrate animals.

The results of the form of media development above are the advantages of Lectora Inspire learning media on the sub-theme of Animal Movement Organs in class V at the elementary school level from the previous media. Where the previous media did not have an evaluation of questions and scores, the material has not been presented in depth in accordance with the demands of the curriculum in elementary schools, especially in accordance with learning activities in the curriculum that adapts to the needs of students and the level of student development. And has not provided a menu that is able to relate the connection between one material to another.

The Lectora inspire learning media used will make the thematic learning process for the Animal Movement Organs sub-theme easier to understand and increase students' enthusiasm for learning. In addition, this Lectora Inspire-based learning media also has several supporting tools, namely a menu of instructions for using Lectora Inspire-based learning media which can make it easier for students to understand the steps for using Lectora Inspire-based learning media.
media. Apart from the advantages of Lectora Inspire-based learning media above, this media also has weaknesses. The weakness of this Lectora Inspire-based media is that it cannot be tested directly on students due to the current Covid-19 pandemic in Indonesia.

The next step taken at this stage is product validation by media experts, material experts, linguists and teacher responses to several aspects of media assessment. Material validation is carried out with the aim of obtaining material that is in accordance with the developed media. The results of material validation obtained an average value of 95% with the "very good" category. It can be concluded that the material on the Lectora Inspire-based learning media component is very feasible to use. Media validation is carried out with the aim of obtaining media that is suitable for use.

The results of media validation obtained an average value of 93.75% with the criteria of "very good". It can be concluded that the Lectora Inspire-based learning media is feasible to use. Language validation is carried out with the aim of obtaining appropriate linguistic rules on the media so that they are suitable for use. The results of language validation obtained an average value of 96.66% with the criteria of "very good". It can be concluded that Lectora inspire-based learning media is feasible to use. The validation of the teacher's response was carried out with the aim of obtaining appropriate media and in accordance with the learning process. The results of the validation of the teacher's response obtained an average value of 97.61% with the criteria of "very good". It can be concluded that the Lectora Inspire-based learning media is feasible to use.

The following is presented in the form of a diagram of the results of the assessment by media experts, material experts, and teacher responses.

![Fig.2. Expert assessment result chart](image)

The results of the validation of the experts obtained an average value of 95.75% with the criteria of "very good". It can be concluded that the Lectora Inspire-based learning media is feasible to use. Because all aspects of the assessment of the media are in the very valid category, the media that has been developed can be used at a later stage and the media can be used both at school and outside of school as learning media on the sub-theme material Animal Movement Organs in class V SD.
Table 4. Product Revision

<table>
<thead>
<tr>
<th>Before Revision</th>
<th>After Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is an error in making the logo contained in the opening page of the media where the logo is the Universitas Negeri Medan logo. The media validator directs that the logo be changed to a more specific logo, namely the Fakultas Ilmu Pendidikan Universitas Negeri Medan Logo.</td>
<td>The logo has been changed to a more specific logo in accordance with the advice given by a media expert validator, namely the Fakultas Ilmu Pendidikan Universitas Negeri Medan logo.</td>
</tr>
<tr>
<td>![Before Revision Image]</td>
<td>![After Revision Image]</td>
</tr>
<tr>
<td>There is no back button to the previous view on each page of the media.</td>
<td>On each page there is a back button icon in the form of a rabbit image to make it easier for users to operate.</td>
</tr>
<tr>
<td>![Before Revision Image]</td>
<td>![After Revision Image]</td>
</tr>
</tbody>
</table>
The menu arrangement on the media is not appropriate in every stage of its function. The composition of the media has been made sequentially according to the stages of its function and in accordance with suggestions from expert validators, namely as Instructions, Competencies, Learning Activities, Evaluations, and Profiles.

There is no image source for every image displayed on the media. There is an image source in every image displayed on the media.

In the material for locomotion in animals, the material is still too abstract, which is only in the form of images. In the material for locomotion in animals, material is included in the form of videos learning the differences in animal locomotion and grouped into vertebrates and invertebrates.

In the formulation of indicators for Indonesian subjects, it is still too ambiguous and has not fulfilled significantly the achievement of basic competencies. The formulation of indicators in Indonesian subjects has been in accordance with the achievement of basic competencies and has been improved based on suggestions from the Linguist Validator.
There are several difficulties that researchers experience when conducting research during the current Covid-19 pandemic, such as:

1) The limitations of doing activities outside the home and the limitations of students who do not have many Android-based smartphones that have high storage capacity.
2) Students do not come directly to school and the school directs assignments to be collected by parents.
3) Researchers have a pause when they will carry out research directly to students.

4 Conclusion

Based on the formulation of the problem that has been described by previous researchers, namely the Development of Lectora Inspire-based learning media that was developed was Valid and in accordance with the Characteristics of Class V Students at SD Negeri 066046 Perumnas Helvetia Medan T.A 2020/2021 in mastering the material for the sub-theme of Animal Movement Organs. Based on the validity test data, the Lectora Inspire-based learning media on the Animal Movement Organs sub-theme meets the valid category with the feasibility of being used in learning the Animal Movement Organs sub-theme material, this feasibility is based on:

a. Eligibility test of media experts who get a score of 93.75% (Very decent),
b. Feasibility test of material experts who get a score of 95%, (very feasible),
c. Feasibility test of linguists who got a score of 96.66%, (Very decent),
d. The feasibility test of the effectiveness of the use of instructional media on the fifth grade teacher respondents at SDN 066046 Perumnas Helvetia Medan 97.61% (very feasible).

From the four expert validation scores obtained an average value of 95.75% with the criteria of "very good". So that the Lectora Inspire-based learning media is feasible to use. Research and development of Lectora inspire-based media for fifth grade elementary school students which has been carried out in accordance with the research and development procedures from Thiagarajan which have been simplified due to the limited circumstances that occur in the midst of the current conditions, namely the Covid-19 pandemic.

Acknowledgement
The author would like to thank all those who supported the implementation of this research. The author also thanks the Directorate of Education and Culture for providing funding for the implementation of this research. Hopefully the results of this study will be of benefit to us.
References

Science Literacy-Based E-Module Development in Elementary Students

Lala Jelita Ananda1, Imelda Free Unita Manurung2, Lidia Simanihuruk3, Suyit Ratno4, Erika Amalia5, Nurwahyun6

{jananda.84@gmail.com}

Faculty of Education, Universitas Negeri Medan-Indonesia

Abstract. In this study, the development of an E-Module based on science literacy was carried out on the ecosystem theme which was used to improve science literacy for fifth grade elementary school students. The results showed that the validation process by the media expert validator obtained an average of 4.76 with the “Very Good” category, the percentage of eligibility was 95% which was categorized as “Very Eligible”, the validation process by the material expert validator obtained an average value of 4.71 “Very Good” categories with a percentage of 94% categorized as “Very Eligible”. Practicality tests by education practitioners obtained a practicality percentage 95% and were included in the “Very Practical” category. The results of student responses obtained a percentage 96% and were included in the “Very Practical” category. Based on the results of the effectiveness test of the E-Module, it can be seen that after using the E-Module, the average score of students increased from the initial average before using it, namely 61.25 with the “Enough” category and the completeness criteria “Not Complete” to 87.18 with “Very Good” category and completeness criteria “Complete”.

Keywords : Science Literacy-Based E-Module, Ecosystem Theme, Grade V Elementary School.

1 Introduction

Ilmu Pengetahuan Alam (Science) is a science that learns about all events that are around. Science as a subject is given starting from the elementary school level to the high school level. In the 2013 curriculum at the elementary school grades I, II, and III, science content is integrated into the basic competencies of Indonesian subjects in the form of reading materials. Meanwhile, the science content in grades IV, V and VI, is no longer integrated with the basic competencies of other subjects, but the learning continues through integrated thematic learning.

Science in the 2013 curriculum aims to develop scientific thinking in elementary school students. Science learning in elementary schools has the aim of preparing students to study science at a higher level of education, preparing students to enter the challenges of the world of work or carrying out tasks in their field of work and preparing students to become members of a science literate society.

Indonesian is also a subject that is learned in elementary schools from grade 1 to grade 6. Learning in this elementary school can be divided into low-grade and high-grade learning. Learning Indonesian in lower grades uses a thematic approach or is integrated into the basic competencies of other subjects. Indonesian language learning is directed at improving students'
ability to communicate using Indonesian properly and correctly which includes four aspects of skills, namely listening, speaking, reading, and writing skills. These four aspects of skills are part of literacy. Literacy is one of the language skills, namely the ability to read and write. Literacy is a person's language ability which includes listening skills, speaking skills, reading skills and writing skills and it can be said that literacy is language literacy.

In carrying out learning, learning tools are needed. Learning tools are a form of preparation made by a teacher before carrying out learning activities. Learning tools are also defined as a number of materials, tools, media, instructions, and guidelines that will be used during teaching and learning activities. It is very important to prepare for learning through the development of learning tools.

The purpose of preparing learning tools is so that everything that has been planned together can be achieved. Learning tools are needed as a guide or guide when carrying out learning. Learning tools will provide direction for a teacher. This is important considering the learning process is something that is systematic and patterned. Learning tools are useful as a guide for teachers on what teachers should do in the classroom. Learning tools also greatly facilitate a teacher in helping the learning facilitation process. With learning tools, a teacher can easily deliver material only with the help of learning tools that have been prepared in advance.

The Covid-19 pandemic that has hit most parts of the world, including Indonesia, is currently affecting several sectors, one of which is education. The world of education is currently feeling the impact of this pandemic so that current learning cannot be carried out directly or face to face.

However, learning must continue. So educators must ensure that teaching and learning activities continue, even though they are carried out remotely or from home. As a result of distance learning activities, teachers are required to design various learning tools as innovations by utilizing online media. With learning carried out like this, learning tools are also needed that support online learning. Learning tools needed such as teaching materials and technology-based learning media.

From the results of initial observations at SD Negeri 101777 Saentis, it is known that the types of learning resources available at this school are still limited. The learning resources available at this school are only learning resources provided by the government, namely teacher books and student books. The teacher has never innovated the development of teaching materials as a companion to the available thematic books. In learning, teachers only use learning resources provided by the government. Learning resources currently available only emphasize students' understanding of the concept.

Therefore, the mastery of students in the context of students' scientific literacy which includes aspects of science application, aspects of scientific knowledge, aspects of scientific processes, aspects of scientific attitudes of science are still lacking. This is evident from the lack of students' ability to draw conclusions, ask questions, in written and oral form and in making decisions. Teachers in learning need other learning resources in addition to the available thematic books. Teachers need teaching materials with different types from those currently available, which can train students to learn independently.

So far, in the implementation of learning, students tend to depend on information from the teacher. Therefore, it is necessary to innovate teaching materials that help teachers and students carry out learning. Innovation in the development of teaching materials is needed to facilitate learning activities so that learning is not only centered on the teacher because students can learn independently through teaching materials that have been made previously.

Based on previous research, it is known that the effectiveness of scientific literacy-oriented teaching materials is to improve student learning outcomes. Scientific literacy that appears
during learning is that students and teachers ask questions during learning. Students answer questions by giving examples of events they experience in everyday life. Therefore, it is necessary to develop non-printed teaching materials (E-Modules) which will be presented in an attractive manner with science literacy-based materials and examples that are familiar with the daily lives of students and are equipped with video explanations of material that are easy for students to understand. With the development of this E-Module, it can help students be more interested in learning and make it easier for students to learn science lessons so that it helps students to explore their ideas so that they are able to acquire new knowledge by themselves.

2 Research Methods

This research is a Development Research (R&D). Sugiyono (2017) suggests that research and development methods are research methods used to produce certain products and test their effectiveness. The development model used in the development of this teaching material is the ADDIE model. According to Sugiyono (2019: 38) this ADDIE model consists of 5 stages, namely Analyze, Design, Development, Implementation, and Evaluation. The development design that will be used in this research is ADDIE.

3 Result and Discussion

E-Module Development Process

The development of the E-Module will greatly assist teachers in carrying out learning in schools, therefore the result of the development of this E-Module is an E-Module Based on Science Literacy on the theme of ecosystems in class V SD Negeri 101777 Saentis. The development of this E-Module was developed using the ADDIE development model which consists of five steps, namely analysis, design, development, implementation and evaluation.

The Analyze stage is carried out to determine the needs of students and teachers in the learning process as well as the problems encountered when carrying out the learning process. At the analysis stage, the researcher conducted an analysis of teacher needs, analysis of student needs, analysis of curriculum and learning tools, analysis of basic competencies and indicators, analysis of student characteristics. From the research results, the researchers obtained data regarding the analysis of teacher needs through interviews with fifth grade teachers at SD Negeri 101777 Saentis.

Based on the analysis, teachers really need learning resources other than thematic handbooks as learning resources. then based on the analysis of students, it is known that students have not been able to explore independently the material being studied and it is known that students need more interesting learning resources and can learn independently. Therefore, it can be concluded that the research subjects need learning resources that are in accordance with their needs.

The second stage is Design. At the design stage, the researcher prepared an initial plan for making an E-Module based on science literacy. The activities carried out at this stage are compiling materials in accordance with the 2013 curriculum, namely thematic learning on the ecosystem theme sub-theme 1 learning 1 and 2 by collecting materials as material from several sources and then systematically arranged according to the learning implementation plan. which has been made. Furthermore, the researchers also designed an assessment instrument in the form
of a questionnaire and questions to get an assessment of the feasibility, practicality and effectiveness of the E-Module made.

Based on the results of the practicality test of the E-Module by looking at the recapitulation of the students' response results, it can be seen that the average practicality percentage is 96% and in the "Very Practical" category and the recapitulation through the responses of education practitioners (teachers) it is known that the average practicality percentage is 95% and in the "Very Practical" category.

Based on the results of the implementation, the effectiveness of the E-Module test can be seen from the increase in student learning outcomes and achievement of the minimum completeness criteria. It can be seen that student learning outcomes increased before using the E-Module, obtaining an average of 61.25 and included in the "Enough" category and the completeness criteria "Not Complete" but after using the E-Module, the average score of students increased to 87.18 with the "Very Good" category and the completeness criteria "Complete".

The last stage is Evaluation where the researcher improves the E-Module based on the small notes given by the validator and teacher. Even though it is valid, there are still a few things that need to be improved on the science literacy-based E-Module in order to produce the best results.

**Media Development Results**

After going through the design and development stages, the resulting E-Module also has several changes, the following are the results of the E-Module that has been developed:
4 Conclusion

Research and development of an E-Module based on science literacy on the theme of ecosystems in class V of SD Negeri 101777 Saentis, Percut sei Tuan District has been completed in accordance with the steps and stages of development research. Based on the research and development carried out by the researchers, several conclusions were obtained, namely:

An e-Module based on science literacy on an ecosystem theme that has been developed and validated by media expert validator Mrs. Masta Marselina Sembiring, S.Pd., M.Pd with an average score of 4.76 and a total score of 95% with the category "Very Worthy". Then material validation by material expert validator Mr. Faisal, S.Pd., M.Pd with an average value of 4.71 and a total score of 94% in the "Very Eligible" category. Based on the validation carried out by media expert validators and material expert validators, the E-Module based on science literacy on the ecosystem theme is suitable for use in the learning process.

The e-Module based on science literacy on the ecosystem theme that has been developed is then tested for practicality through validation of educational practitioners and student responses. Validation by education practitioners was carried out by Mrs. Misngatun, S.Pd as a fifth grade teacher at SD Negeri 101777 Saentis. Based on the results of the data obtained a percentage of 95% with the category "Very Practical". Furthermore, through the results of the students' responses, they obtained a percentage of 96% of the data in the "Very Practical" category. Based on the results of the practicality assessment by education practitioners and student responses, the E-Module based on science literacy on the theme of a practical ecosystem is to be used.

The e-Module based on science literacy on the ecosystem theme that was developed has been tested classically to see an increase in student learning outcomes. Based on the results of the trial, it was seen that the learning outcomes of each student before and after using the E-Module based on science literacy were seen. Before using the E-Module based on science literacy, the average score of students was 61.25 and after using the E-Module based on science literacy on the ecosystem theme, the average score of students increased to 87.18 with the category "Very Good" and finished. Based on these results, it is known that the E-Module based on science literacy on the ecosystem theme is effective to use.

Acknowledgement

The author would like to thank all those who supported the implementation of this research. The author also thanks the Directorate of Education and Culture for providing funding for the implementation of this research. Hopefully the results of this study will be of benefit to us

References

Abstract. This research aims to 1) Develop interactive multimedia-based learning media power point, 2) know the feasibility of interactive multimedia-based learning media power point, and 3) know the effectiveness of interactive multimedia-based learning media power point in blood system materials in humans in Primary 5th SDN 101928 Rantau Panjang based on the results of field trials. Based on the results of research 1) interactive multimedia power points developed with 10 stages, namely potential problems, data collection, product design, design validation, design revision, product trials (small scale), product revisions, field trials (large scale), revisions, and mass products, 2) the results of expert validation of materials including excellent categories (3.7) the percentage of feasibility of 92.5% belongs to the category is very feasible, the average assessment of interactive multimedia-based learning media power points is declared "Very Good" (3.78) and "Very Decent" (94.6%).

Keywords: Research and Development, Interactive Learning Media, Power Point

1 Introduction

Education is any living situation that affects an individual's growth as a learning experience that takes place in all environments and throughout life. Education is a conscious effort, which is carried out in the form of learning where there are educators who serve their learners to conduct learning activities, and educators assess or measure the success rate of learning learners with prescribed procedures. Education itself is a teaching that is held generally in schools as a formal educational institution.

School as a formal educational institution is one of the educational institutions that are where the teaching and learning process takes place. Teaching and learning is an educational activity. However, during the Covid-19 pandemic educators cannot interact directly with learners. Interactions of educational value are not maximally accepted by learners because learning activities carried out by schools only use offline and online learning. The use of this technology encourages government efforts in learning during the Covid-19 pandemic.

Technology is growing very rapidly making the learning process no longer monopolized by the presence of learners in the classroom. Students can learn where and whenever. But due to the lack of school facilities and infrastructure, learners learn only using books received from
the government. Educators who only sourced the teacher's book make learning less attractive to learners in receiving information provided by educators. Therefore, there needs to be the use of interactive multimedia-based learning media as a tool to clarify the information conveyed by educators. This is as stated by AECT (Association of education and communication technology) "media as a symptom of the form and channel used to convey messages or information".

Learning media is recognized as one of the success factors in learning. With interactive multimedia-based learning media learners can be motivated, engaged physically and psychologically actively, maximize all learners' senses in learning, make learning more meaningful, and learners get hands-on experience. In IPA learning using technology is very influential on learning outcomes, because IPA learning in high classes is abstract, therefore with the interactive multimedia-based learning media learners can see firsthand how the process of the human body.

IPA lessons are expected to be a vehicle for learners to learn themselves and the environment, as well as the prospect of further development in applying them in everyday life so that they can adjust to phenomena and changes in the environment around him. In other words, IPA learning aims to develop the potential of learners through the provision of experience by exploring and understanding the environment scientifically. The development of learners' self-potential will run effectively if an educator is able to use the right teaching methods and media. In the time of the covid-19 pandemic learners cannot learn face-to-face, therefore technology-based media is needed to facilitate the online learning process. In the application of learning methods and media selected by educators in providing a subject matter is very decisive to the success of the learning process, especially what educators must pay attention to is in the selection and use of technology-based learning media.

The use of interactive multimedia-based learning media in elementary school learning is still very inadequate, because educators' knowledge of technology is also an obstacle in the online learning process. Based on observations made by researchers on Wednesday, September 23, 2020 at SD Negeri 101928 Rantau Panjang Kec. Labu Beach researchers see the interactive multimedia-based learning media Power Point is not adequate in SD Negeri Rantau Panjang. As per the results of the researcher's interview with the class V class guardian stated that during learning educators use passive learning media in the form of images in cardboard, and during the pandemic covid-19 learning is done online. Therefore, there needs to be an introduction in learning to use technology to educators and learners. And researchers saw low student learning outcomes in grade V of 101928 Rantau Panjang State Elementary School after carrying out observations to the school. This is evident from the results of the analysis of the daily value of IPA Theme 4 system material.

Human and animal blood circulation, the learning results of learners must meet the value of minimum completion criteria (KKM) that is by obtaining a value of 75. Students of class V of State Elementary School 101928 Rantau Panjang obtained a repeat value of IPA of circulatory system material in humans below an average of 55% (incomplete) from 22 learners who scored above 75 only 12 people and who scored less than 75 as many as 11 people. Low learning outcomes during the covid-19 pandemic, researchers saw from the absence of supporting media learning when delivering IPA material. Educators only provide tasks that are in the package book, so that the knowledge of learners is only obtained from the reading text contained in the student package book.

Limitations of learning support media result in the learning process of learners is not maximal. Media helps the delivery of messages, and the content of lessons and can increase the interest of learners in learning. The absence of learning media during the online learning process becomes an obstacle for educators in delivering subject matter. During the pandemic covid-19
the delivery of material is less than optimal because the learners do online learning. And before the pandemic covid 19 educators also have constraints that are time, in conveying the material of the circulatory system educators are constrained by time constraints, because when drawing the circulatory process a lot of time is used only to draw material on the board. So that educators have limited time in explaining the material.

2 Research Methods

This research uses research and development methods or often called Research and Development (R&D). Research and development is a research method for developing and testing products in the world of education. In addition to developing and testing research products, it is used to discover new knowledge about fundamental phenomena, as well as educational practices. Serves to find fundamental phenomena done through basic research (basic research). Then for research educational practices conducted applied research (applied research).

Sugiyono (2010, h.407) says that R&D research is a research method used to produce a particular product and test the effectiveness of the product. In order to produce a product then using research that is a needs analysis to test the effectiveness of the product in order to function for the wider community, research is needed to test the effectiveness of the product. In research and development this is longitudinal means that it is done gradually.

This research and development method research and development R&D in addition to being used in the natural sciences and engineering can also be used in other fields of science. This research is suitable for product development. In developing the R&D research method, researchers developed 10 steps of Borg and Gall development developed by Sugiyono.

\[ \text{Fig 1. Steps of R&D Research (Research and Development)} \]

According to Sugiyono (2010, p. 298) potential is "everything that when used will have added value". Potential and problems raised in a study must be demonstrated by empirical data. Data about potentials and problems do not have to be searched for yourself, but usually based on other research reports, or documentation of activity reports that are still up to date. The potential problems raised in the research must be demonstrated by empirical data. For example, the potential for wind energy on the coast must be able to put forward some data including the strength of the wind, where the wind direction is from, and wind speed. The wind data is then used to design windmills or other products to generate mechanical energy from the wind.

This study uses a development procedure that produces an interactive multimedia-based learning design. This interactive multimedia-based media was developed based on the research steps of Borg and Gall's development. The development procedure starts from the potential and problems to produce a final product design in the form of the development of interactive
multimedia-based learning media. Natural science subjects for the human circulatory system for fifth grade students at SD Negeri 101928 Rantau Panjang.

Thus, the researchers chose this research for the development of interactive multimedia-based media on the Human Circulatory System material for class V SD Negeri 101928 Rantau Panjang. The development of Borg and Gall in accordance with the steps that have been described, the researchers developed this research through 10 steps as follows:

Data collection techniques in this study used observation, interviews, questionnaires or questionnaires, pre-test, post-test and documentation.

a. Observation is a way of collecting data by observing directly the object of research. Researchers choose observation participant is a method of observation in which the researcher takes part of the activities carried out by the object under investigation.

b. Interview, used as a data collection technique when the researcher conducts a preliminary study to find the problem. Interviews were also conducted to find out the initial data in research and the information obtained is used as a input for developing learning media on the material of the circulatory system in humans in class V SD Negeri 101928 Rantau Panjang FY 2020/2021.

c. Questionnaire (Questionnaire) is a number of written questions that used to obtain information from respondents. Questionnaire used when evaluating and testing interactive multimedia-based learning media.

d. Pretest, learning outcomes test is used to measure learning outcomes before using interactive multimedia-based learning media Power Point. Pre-test is used to determine the initial ability of students.

e. Learning outcomes test (post-test), learning outcomes tests are used to measure student learning outcomes after studying the subject matter. The test used is a formative test, which is carried out to measure the level of student mastery of the material given.
f. Documentation, in the form of photos, images, and supporting data research conducted. Research results from observations and the interview will be stronger if it is supported by photos documentation.

The instrument was used to collect data during the process of developing interactive multimedia-based learning media on the material of the circulatory system in class V humans in the form of a questionnaire. Data collection in this study used an instrument that was divided based on the source of data acquisition consisting of a validation questionnaire from media experts, material experts, teachers and students during field trials. And researchers also collect data on student learning outcomes.

3 Results and Discussion

The research was conducted at SD Negeri 101928 Rantau Panjang which is located on Jl. Raya Rantau Panjang No. 3 District of Labu Beach, Deli Serdang Regency. The subjects in this study were fifth grade students of SD Negeri 101928 Rantau Panjang, one material expert, one expert on Power Point-based interactive multimedia learning media and one education practitioner, namely the fifth-grade teacher of SD Negeri 101928 Rantau Panjang. The first potential problem in this study is the ineffective use of technology by teachers in carrying out the teaching and learning process.

During the COVID-19 pandemic, technological advances really require teachers to be creative and innovative in the delivery of the teaching and learning process so that material is delivered according to learning objectives, especially in the field of technology. Observations made by researchers at SD Negeri 101928 Rantau Panjang were conducting interviews with homeroom teachers for class V, teachers at SD Negeri 101928 Rantau Panjang still using passive image media during the learning process. Other data obtained by the researcher shows the learning outcomes of students under the KKM.

In problems like this, teachers must be able to find solutions so that all potential students can develop well in the direct or indirect learning process. Based on the results of the study, the researchers concluded that it is necessary to develop learning media that can motivate students to learn to be effective and the material to be delivered as expected. Potential problems are the first step that must be done in this research. Seeing these problems, the researchers took the initiative to develop science learning media based on interactive multimedia Power Point on the material of the human circulatory system, with learning media that contained animated video explanations and evaluations related to the material and also aimed to reduce students' perceptions of the circulatory system material. which is considered so far difficult to be boring and understood.

Potential problems begin with the analysis phase in this study including needs analysis, student analysis, and curriculum and material analysis. The instrument for assessing learning media based on interactive multimedia Power Point is based on a questionnaire with a Likert scale. The questionnaire consists of 4 answer choices, namely 1, 2, 3, and 4, each of which states very not good, not good, good, very good which is used to assess the quality of the feasibility of the learning media developed by the researcher.

This questionnaire has been validated by Mrs. Masta Marselina Sembiring, S.Pd., M.Pd. as a lecturer at the Faculty of Education. There are three eligibilities in this questionnaire, namely: clarity, content accuracy, language accuracy. In this study, the researcher added and modified the questionnaire according to the needs of the researcher, namely by adding the feasibility
aspect according to the learning media developed. In addition, there are also learning outcomes to see the effectiveness of learning media and researchers also look at student response questionnaires to learning media developed by researchers which are also compiled based on a Likert scale to find out how students respond after learning using interactive multimedia-based learning media Power Point developed by researchers.

### Table 1. Recapitulation of Material Expert Validation Results

<table>
<thead>
<tr>
<th>Component</th>
<th>No</th>
<th>Indicator</th>
<th>Evaluation</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspects of Material Content</td>
<td>1.</td>
<td>The interactive Power Point multimedia developed is in accordance with the core competencies and basic competencies in the thematic learning of the 2013 curriculum.</td>
<td>3</td>
<td>Well</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>The interactive Power Point multimedia developed is in accordance with the learning indicators with basic competencies</td>
<td>3</td>
<td>Well</td>
</tr>
<tr>
<td></td>
<td>3.</td>
<td>The interactive Power Point multimedia developed is in accordance with the learning materials with the indicators achieved</td>
<td>4</td>
<td>Very good</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Subtotal A</strong></td>
<td><strong>10</strong></td>
<td></td>
</tr>
<tr>
<td>Aspects of Material Presentation</td>
<td>4.</td>
<td>The material information presented in the Power Point-based science learning media is easily understood by fifth grade elementary school students.</td>
<td>4</td>
<td>Very good</td>
</tr>
<tr>
<td></td>
<td>5.</td>
<td>The material presented in the science learning media based on interactive multimedia Power Point is arranged according to the experiences that exist in the students' environment</td>
<td>4</td>
<td>Very good</td>
</tr>
<tr>
<td></td>
<td>6.</td>
<td>The explanation of the material is presented in the form of animated images and videos that make it easier for students to understand the material</td>
<td>4</td>
<td>Very good</td>
</tr>
<tr>
<td></td>
<td>7.</td>
<td>The material in interactive multimedia Power Point is arranged systematically in order to stimulate students' ability to think scientifically.</td>
<td>3</td>
<td>Well</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Subtotal B</strong></td>
<td><strong>15</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.</td>
<td>Writing vocabulary on the material developed is in accordance with the level of students' thinking abilities</td>
<td>4</td>
<td>Very good</td>
</tr>
<tr>
<td></td>
<td>9.</td>
<td>The suitability of sentences in multimedia is easy to understand and does not have multiple meanings</td>
<td>4</td>
<td>Very good</td>
</tr>
<tr>
<td></td>
<td>10.</td>
<td>The writing of the material used is in accordance with the use of EYD (Enhanced Spelling), punctuation marks, and capital letters.</td>
<td>4</td>
<td>Very good</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Subtotal C</strong></td>
<td><strong>12</strong></td>
<td></td>
</tr>
<tr>
<td>Total score obtained</td>
<td></td>
<td>$= \text{Subtotal A} + \text{Subtotal B} + \text{Subtotal C}$</td>
<td>$= 10 + 15 + 12$</td>
<td>$= 37$</td>
</tr>
<tr>
<td>Total number of items</td>
<td></td>
<td></td>
<td>$= 10$</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td>$\frac{\text{jumlah skor}}{\text{jumlah item}}$</td>
<td>$\frac{37}{10}$</td>
</tr>
</tbody>
</table>
Based on table 4.5, it can be concluded that the results of the thematic material expert validation obtained an average of 3.7 and are included in the "Very Good" category. Based on table 4.5, it can be seen that the assessment of the results of material expert validation is in the following diagram:

![Material Expert Validation Assessment Chart](image)

4 Conclusion

Based on the results of research and discussion in Chapter IV, this research and development can be concluded that:

a. Power Point interactive multimedia-based learning media was developed by following the steps of Borg and Gall's research which included the stages of potential problems, data collection, product design, design validation, design revisions, product trials (small scale), product revisions, field trials (large scale), revision, and mass product.

b. The feasibility of learning media based on interactive multimedia Power Point on the healthy theme is important in class V by expert validation of the science material for the circulatory system in humans, obtaining an average assessment of 3.7 and the percentage of feasibility of 92.5% belonging to the very good and very feasible categories. While the validation of the interactive multimedia-based learning media Power Point obtained an average rating of 3.66 and a feasibility percentage of 91.8% belonging to the very good and very decent category. And finally, the validation of education practitioners who are VC class teachers at SD Negeri 101928 Rantau Panjang obtained an average rating of 3.83 and an eligibility percentage of 95.8% which is included in the very good and very decent category.

c. The results of the small-scale student trial using 8 students with very good results. This can be seen from the responses of students and student learning outcomes after using the Power Point interactive multimedia learning media. The results of the students' responses to the Power Point interactive multimedia-based learning media obtained an average of 3.91 which was included in the very good category and the percentage of eligibility 97.5% was included in the very feasible category. And the learning outcomes of students in the early stages / small scale pre-tests obtained an average value of 39.37 and the percentage of effectiveness was 0 and the post-test results obtained an average value of 85 with an effectiveness percentage of 87.5% belonging to the effective category so that the learning media was feasible. to be tested at the next stage / on a large scale. While the field trial on a large scale used all 22 students of class VC SD Negeri 101928 Rantau Panjang. Student responses in the field test obtained an average of 3.83 in the "very good" category and the percentage of eligibility was 95.65%. While the results of the pre-test only got an average
of 38.18 with a percentage of 9.5% belonging to the ineffective category and after the researcher gave the subject matter using interactive multimedia Power Point, the post average score was 88.86 with a percentage 86.36% which is classified as effective, so it is feasible to be used as a learning medium for students in the classroom.

References

Improving Teachers Professionalism through E-Learning Content Creation Training

Muhammad Fajar Marsuki1, Ismanik Juni Fitriyah2, Indra Fardhani3, Firdha Cahyaningwulan4, Febriana Nur Fauziah5
{muhammad.fajar.fmipa@um.ac.id}
Department of Science Education, Universitas Negeri Malang, Malang

Abstract. The Covid-19 pandemic has forced the educational process to run virtually since the beginning of 2020. Virtual learning makes it difficult for teachers to understand topics meaningfully to students. Therefore, the department of science education, State University of Malang provides training with synchronous and asynchronous methods to teachers to improve their professionalism in creating e-learning content. The results of the training show that 85% of participants who survive to the final stage can create e-learning content well. A total of 63.2% of participants are more interested in creating a Moodle-based LMS, 12.3% are more interested in creating a podcast, and 24.5% are more interested in creating a hybrid learning module.

Keywords: E-Learning, Teacher Professionalism, Training, Moodle, Podcast, Hybrid Learning

1 Introduction

The learning process in the classroom is always built by several elements, namely educators, students, learning strategies, learning media, and teaching materials. These five elements of learning are very influential on the success of a learning process. The learning process is said to be successful if students experience changes in behavior as a result of the stimuli and experiences they receive during the learning process. However, the learning process generally always has its problems. This problem is often caused by one of the five elements of the learning process. Problems in the learning process are usually specific depending on the characteristics of the class [1–3].

The central government's policy for the implementation of Distance Learning during the COVID-19 pandemic will also continue in 2021 [4–7]. The implementation of this distance learning is mandatory because it is one of the effective policies in tackling the spread of the COVID-19 virus in the Republic of Indonesia. But on the other hand, Distance Learning which has been carried out since the beginning of 2020 until now has caused several problems for various parties in the education unit. The examples are:

a. Students find it difficult to understand the learning material without meeting face to face with the teacher.
b. There are several areas where the infrastructure is inadequate to implement Distance Learning so that it has an impact on students and teachers.
c. Many students who are economically unable to have a smartphone as the main medium for distance learning.
The emergence of acts of violence against students by parents/guardians of students because they are disappointed with the learning performance of students during distance learning.

e. The teacher's ability is still low in compiling and/or using various learning facilities that can be used in Distance Learning.

The problems that have arisen since the start of Distance Learning are also experienced by education units at the junior high school level in several regencies in the Republic of Indonesia. Several teachers recounted their experiences when conducting Distance Learning since the beginning of 2020. The most difficult thing for teachers in education units at the junior high school level is to prepare the content that will be given in Distance Learning [8–10].

Generally, teachers only use the Whatsapp application as a medium to give instructions to students. Likewise with the delivery of learning materials which are usually given through the Whatsapp application. This is of course very inefficient considering that Whatsapp is not an application specifically designed to support Distance Learning activities. This problem becomes a very priority because the results will greatly affect the level of understanding of students towards the learning material.

To overcome the problem of the lack of teachers' ability to use and/or compose content that is by Distance Learning, the Department of Sciences Education, Universitas Negeri Malang initiated training for these teachers. The training in question is training to develop suitable and full-power e-learning content for students. The training was carried out in 3 stages, namely the face-to-face stage to provide materials related to the development of e-learning content, the independent work stage to provide opportunities for teachers to develop the e-learning content they had previously studied, and the online consultation stage to guide and assess the products of the trainees.

2 Research Method

This research was carried out in several stages. The first stage is to screen applicants online in the form of an online registration form. The second stage is to provide online training to participants synchronously via video conference for one meeting and asynchronously through the Learning Management System for two meetings. The training provided covers the following themes:

a. Effective and Efficient E-Learning
b. Moodle-Based E-Learning
c. Podcasting
d. Scientific Research-Based on Hybrid Learning

The second stage ends with participants collecting training products. The third stage is the process of evaluating participants' products using a product assessment rubric to see the feasibility of the products developed by participants. The research instrument used in this study was a material evaluation questionnaire and committee services questionnaire. All questionnaires used in this study used a Likert scale of 1 to 4. The results of the questionnaire obtained were tested for validity using the product-moment Pearson correlation method and also tested for reliability using Cronbach's Alpha method using the SPSS application.
3 Results and Discussion

Based on the results of the data entered into the implementing team for community service activities, the Department of Science Education, Universitas Negeri Malang, the number of registrants who filled out the Google registration form on 27 and 28 September 2021 reached 608 people with details of 525 registrants from the teachers, 24 registrants from the academic community, lecturers, 49 registrants from students, and 6 registrants from education practitioners.

This data shows that the training courses offered can attract the interest of people working in the field of education, especially teachers. However, of the 608 registrants who filled out the Google registration form, only 500 participants took the initiative to enter the participant's Whatsapp Group which had been provided by the community service implementation team of the Department of Science Education, Universitas Negeri Malang and it can be said that these 500 people indeed intend to participate in training activities for the creation of e-learning content for teachers carried out by the implementing team for community service activities, the Department of Science Education, Universitas Negeri Malang.

Of the 500 participants who have entered the participant's Whatsapp Group, only 482 participants confirmed their attendance at the synchronous activity of e-learning content creation training for teachers which was carried out by the implementing team for community service activities of the Department of Science Education, Universitas Negeri Malang. However, on the day of the synchronous activity (October 2, 2021), only 354 participants were able to attend as evidenced by filling in the attendance given by the implementing team for community service activities for the Department of Science Education, Universitas Negeri Malang in the form of a Google Form.

All participants who attended the synchronous activity of the e-learning creation training for teachers also managed to join and participate in accessing the Google Classroom which had been provided by the community service implementation team for teachers. Even though until the last day of collecting training bills, only 155 participants were able to complete the invoices and collect their products through Google Classroom for further evaluation by the training lecturers.

If described in more detail, for Moodle-based LMS products using the Moodlenesia Platform, 82 products were declared eligible, while the remaining 16 products were declared unfit by the Moodle-based LMS training lecturer, Muhammad Fajar Marsuki, S.Pd., M.Sc. For podcast products, 17 products were declared eligible and the remaining 2 products were declared unfit by the training lecturer, Indra Fardhani, S.Pd, M.Sc, M.I.L., Ph.D. And for the product of the Hybrid Learning practicum module, 33 products were declared eligible and the remaining 5 products were declared unfit by the training lecturer, Yessi Affriyenni, S.Pd., M.Sc.
After the implementation of the synchronous activity of training in the creation of e-learning content for teachers, the team implementing community service activities for the Department of Science Education, Universitas Negeri Malang gave an evaluation questionnaire for the implementation of activities to participants in the form of a Google Form. The results of the questionnaire evaluation of the implementation of the activities showed that 42.9% of participants gave the very good category and 52% of the participants gave the good category for the aspect of the ease of participants accessing information about the training. For the ease of registration process, 49.7% of participants gave the very good category and 44.4% gave a good category, while the remaining 5.9% gave the category quite good or not good.

The main reason was that many participants felt that they did not receive an invitation letter after filling out the Google registration form. It was the participant who wrote the wrong email address on the Google registration form so that the Autocrat application could not send the invitation letter automatically. Some participants who experienced this case were given direction by the implementing team for community service activities, the Department of Science Education, Universitas Negeri Malang, to fill out the Google registration form with the correct data.

For the aspect of ease of communication with the committee, 41% of participants gave the very good category and 51.7% gave a good category. This cannot be separated from the presence of 3 participant WhatsApp groups that have been prepared by the implementing team for community service activities of the Department of Science Education, Universitas Negeri Malang as a medium of communication between the committee and participants. All forms of problems faced by participants can be directly monitored by the committee through the participant’s WhatsApp group. For the aspect of information disclosure from the committee to participants, 45.8% of participants gave the very good category and 47.5% of the participants gave a good category.

These results explain that the committee shows a transparent nature of all processes related to the implementation of e-learning content creation training activities for these teachers. In terms of time management, 28% of participants gave a very good category and 59.3% gave a good category, while the remaining 12.7% gave a fairly good or poor category. This figure is quite high and the main cause of 12.7% giving the category quite good or not good is that participants think that the time for carrying out synchronous activities is too long. The synchronous activities do not last too long, starting at 07.30 to 12.15 AM or about 5 hours and even then it is appreciated as much as 8 hours by the implementing team of community service activities.
The results of the validity test using the Product Moment Pearson Correlation method in the Committee Services questionnaire showed a significance value of 0.000 for the five aspects asked in the questionnaire. This value is smaller than \( \alpha = 0.05 \) so that all questionnaires are considered valid and accurate for use in research [11–13]. The results of the reliability test on the committee's service questionnaire data resulted in a Cronbach's Alpha value of 0.928 and this value was greater than 0.6, which means the data is reliable or trustworthy [14, 15].

![Fig.3. Results of the Evaluation of the Implementation of Activities by Participants](image)

A part from the management of the implementation of activities, the team implementing community service activities of the Department of Science Education, Universitas Negeri Malang also asked participants to provide an evaluation of the implementation of the delivery of material from each training subject. The results of the evaluation showed that about 45.2% to 53.7% of the participants had given the very good category and about 42.7% to 48.3% of the participants gave the good category for delivering the material.

These results indicate that most of the participants considered that the four teaching lecturers had been able to convey their training subjects to a level that was easily understood by the participants. Although there were still around 3.1% to 5.1% of participants considered that the delivery of the material was still quite good or not good enough. This phenomenon may be because the training lecturers are too fast in presenting the material or the participants' initial abilities which may be low in technology so they are unable to follow the explanations of the training eye teachers.

Whatever the cause, this becomes an evaluation material for the team implementing community service activities for the Department of Science Education, Universitas Negeri Malang in carrying out similar activities in the future. The results of the validity test using the Product Moment Pearson Correlation method in the Evaluation Questionnaire showed a significance value of 0.000 for the five aspects asked in the questionnaire. This value is smaller than \( \alpha = 0.05 \) so that all questionnaires are considered valid and accurate for use in research [11–13]. The results of the reliability test on the Evaluation Questionnaire data resulted in a Cronbach's Alpha value of 0.943 and this value was greater than 0.6, which means the data is reliable or trustworthy [16, 17].
4 Conclusion

The team implementing community service activities for the Department of Science Education, Universitas Negeri Malang, has successfully carried out training on e-learning content creation for teachers. A total of 354 participants participated in synchronous activities and 155 of them succeeded in working on the training bill asynchronously. Of the 155 participants, 132 participants produced products that were suitable for use in the learning process in the Education unit based on the assessment of the training eye lecturer who served in these community service activities.

Acknowledgments

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References

Stimulating Elementary Student Higher Order Thinking Skills Through Educational Games in Chromebook

Fatmawati Nur Hasanah\textsuperscript{1}, Putri Rahadian Dyah Kusumawati\textsuperscript{2}, Toni Setiawan\textsuperscript{3}
\{fatmawati.nur.hasanah@iainpekalongan.ac.id\}

Faculty of Tarbiyah and Teacher Training, IAIN Pekalongan, Indonesia\textsuperscript{1}, Faculty of Science and Technology, Universitas Ivet, Indonesia\textsuperscript{1}

Abstract. This study focuses on efforts to stimulate Higher Order Thinking Skills (HOT Skills) in elementary students by using Educational Games in Chromebook. The subject is Mathematics, because Mathematics contains many elements of HOT Skills. The students used in the research were 3\textsuperscript{rd} grade elementary school students in Boyolali Regency with a total of 21 students. This exploration utilizes a qualitative approach, the sort is field research. Information examination procedure utilized is descriptive qualitative analysis. The outcomes showed that the utilization of chromebook included educational games could increase the HOTS of elementary school students, especially in the learning outcomes of 3\textsuperscript{rd} elementary school students in Mathematics.

Keywords: HOT Skills, Elementary Student, Educational Games, Chromebook.

1 Introduction

"Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual strength, self-control, intelligence, noble character, and skills needed by themselves, society, nation and state" [1]. Elementary school is the level of education that forms the basis of secondary and basic education as a "ticket" for further education.

One of the subjects taught by students since elementary school is Mathematics. This subject is one of the lessons at school that gets better attention from teachers, parents and students themselves. The general public's view of Mathematics subjects has not been replaced, namely subjects that are difficult, scary, and boring.

This can be seen in the fact that the average Indonesian student's grades on math learning outcomes fell by 7.4 points, as the PISA (Program for International Student Assessment) results show. organized by the OECD (Organization for Economic Cooperation and Development) and the international consortium in charge of Sampling, instrument, data, reporting, and secretariat problems which are held every 3 years show that Indonesia gets a score of 371 for reading, 379 for mathematics, and 396 for science [2].

Here are the results of PISA 2018:
A student's learning achievement is influenced by many factors, both external and internal factors. One of the external factors includes learning styles, learning media, learning facilities, and so on, while internal factors are interest in learning mathematics, IQ, and other intelligences. The success factor of a student in learning mathematics is indicated by learning achievement [3], [4]. Also, one of the reasons for poor math grades is that students' higher thinking skills are still low, besides this other factor are school facilities, family, student psychology, student abilities, electronic media, and student discipline. Less student-centred learning can also be attributed to the fact that learning is still teacher-centred (teacher-centred learning) rather than student-centred (student-centred learning).

They need Higher Order Thinking Skills (HOTS) to learn math [5]. HOTS are critical, logical, reflective, supercognitive, and creative thinking skills [6][7]. It is the ability to think of higher dimensions. Higher Order Thinking Skill (HOTS) is a thinking ability that requires not only the ability to remember, but also other high abilities such as the ability to think creatively and critically. Applying HOTS education is not an easy task for teachers. Brings life. In addition to having to actually internalize materials and teaching strategies, teachers also face challenges relating to the environment and recruitment of the students they teach.

One of the government's efforts to improve the quality of basic education services is to provide information and communication technology (ICT) equipment to elementary schools. The support mechanism is to distribute funds to schools. The school then carries out procurement of goods and services through the school procurement information system (SIPLah). One of the important milestones in the product's primary educational use is the use of Chromebooks for teaching and learning and distance learning. The government's efforts are to support technological developments that occur today, especially in basic education which also affects the curriculum, learning to learning evaluation, with the advancement of ICT science and technology.

Observations made by researchers in 3rd SD N 1 Tarubatang students, particularly in mathematics, showed that 15 out of 21 students did not meet the KKM (based on minimum completeness). These observations are supported by interviews with classroom teachers and researchers. Researchers interviewed teachers and found a number of contributing factors, including low student HOTS and students' readiness to learn mathematics, the facilities used, and the learning media used.

Based on the problem of low student achievement and to support the government in terms of improving the quality of basic education services and teachers should be able to stimulate students to be enthusiastic in learning [8], researchers are interested in conducting research to simulate HOTS in elementary school students. HOTS in learning does not act as a learning method but HOTS here means learning that is able to create students to think HOTS such as the ability to understand, analyze, evaluate, create, identify a lesson or questions in learning, in this
case it is devoted to Mathematics on the grounds that Mathematics is very closely related to HOTS. Chromebook is a medium that has adaptive elements, as the needs of the 4.0 era challenges [9]. The use of Chromebooks with the reason that on Chromebooks there are various educational games.

2 Research Methods

This research includes field studies, that is, "studies in which data is extracted from the field and conducted systematically." The method used in this study was a qualitative research method. According to Bodgan and Taylor, a qualitative methodology is an exploratory process that generates descriptive data in the form of people's written or spoken and observed behavior [10]. This approach is for backgrounds and the general population. Where to get the results of this study, authors look for existing data to get the data they need with field data. In other words, authors collect data related to the issue they are discussing. Researchers also conduct research that highlights and comprehensively describes all activities carried out within the framework of a field approach, where data and information gathering efforts are accompanied by analysis and revalidation of everything intensively collected.

At this stage, the researcher wants to find and collect various data sources related to the problem under study. This study has master data (primary) and confirmatory data (secondary). The primary data were collected by researchers directly from the source of the question, and the primary data of this study were 21 elementary school students. The secondary data are collected and documented data, and the secondary data of this study are all related to 21 elementary school students. Data collection techniques are the most important step in a survey because the purpose of the survey is to retrieve data from a data source. Therefore, data collection techniques can be implemented in different social situations, taking into account different sources and different means that may be appropriate for the study.

To facilitate the collection of field data, the author uses the following data collection methods: 1) Interviews, interviews are conversations with a specific purpose. The conversation was conducted by two people, the interviewer who asked the question and the interviewee who answered the question. 2) Observation, observation is a technique performed through careful observation and systematic recording. One of the data acquisition technologies records various phenomena (situations, conditions) that occur. 3) Documents, documents search for data about things and variables in the form of notes, transcripts, books, newspapers, magazines, and more.

3 Result and Discussion

The implementation of HOTS-Based Learning for 3rd grade Elementary School Students in Boyolali Regency is carried out through several stages including:

a. Learning Preparation Stage

The preparatory stage was carried out at Elementary School Students in Central Java Province by making a learning implementation plan (RPP) based on the existing syllabus and paying attention to the HOTS values in it. The lesson plans have been made completely and systematically by including the HOTS values. The learning objectives have been designed to develop HOTS values. The application of HOTS values in the learning implementation plan lies in the models, strategies, and learning methods that are planned to be used in learning, as well as on the media used, namely Chromebooks. The use of student
center learning (SCL) learning strategies by utilizing educational games in Chromebooks, and etc.

b. Learning Implementation Stage
HOTS-based learning implementation activities emphasize student-centered learning or known as student center learning (SCL). In carrying out the learning, students are asked to discuss a learning material, then students complete educational games that are in the Chromebook. The teacher is tasked with ensuring that students are always active in learning activities. Learning is designed to achieve learning objectives by involving happy activities for students through games. Students have demonstrated the process of analyzing and evaluating. Students solving problems contained in the game show they have been able to analyze. After completing the games, they conduct an evaluation to find out the advantages and disadvantages when completing the game.

c. Learning Evaluation Stage
Evaluation of learning carried out on 3rd grade students of SD N 1 Tarubatang has used HOTS questions. Using higher level thinking questions in learning assessments trains students with multi-view thinking, which influences their ability to think. The evaluation used refers to Bloom's taxonomy of HOTS [11], are: 1) Knowledge transfer, the transfer of knowledge and thinking skills along the cognitive, emotional and psychomotor domains that become an integral part of the teaching and learning process. Knowledge transfer is not just a teacher presenting material to a class, but students becoming listeners. However, there should be student feedback on the material presented by the teacher. Knowledge transfer is already part of the game on Chromebooks. 2) Problem Solving, Skills with a strong desire to solve problems are born in everyday life. Problem solving is included in the Chromebook game. 3) Critical and Creative Thinking, skills used to solve problems, make decisions, analyze them, investigate them, and draw conclusions when they occur. Critical and creative thinking dominates Chromebook educational games.

![Fig 2. The instructional with a chromebook included educational games.](Source: Personal Documents, 2021)

4 Conclusion

Based on the data that has been collected and the analysis that has been carried out, the researchers conclude that from the implementation of HOTS-based learning implementation activities for 3rd grade students of SD N 1 Tarubatang, Boyolali Regency, Central Java Province as follows:
Based on the data collected and the analysis performed, the researchers conclude from the implementation of HOTS-based learning practices for 3rd students of SD N 1 Tarubatang in the Boyolali Regency, Central Java: a) Since the 2013 curriculum implemented, HOTS-based learning has been conducted. This requires teachers to be able to equip their students with higher thinking skills and 21st century skills, including HOTS; b) The main emphasis in shaping HOTS is on curriculum using the Student Center Learning (SCL) model. Students who use the SCL model to engage in educational activities have higher thinking skills than those who do not. You can maximize your HOTS ability if your training phases are continuous; c) Using a Chromebook in an educational game can increase the HOTS of 3rd grade elementary school students, especially when it comes to math learning outcomes.

Acknowledgement
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References

Stakeholder Satisfaction of the Guidance and Counseling Study Program Medan State University

Mirza Irawan1, Ibrahim Gultom2
{konsmirza@unimed.ac.id1, ibgultom@unimed.ac.id2}
Faculty of Education, Universitas Negeri Medan

Abstract. The purpose of this research is to gather data from stakeholders and former students of the Guidance and Counselling Program at Universitas Negeri Medan's Faculty of Education. Stakeholder satisfaction in terms of (1) learning benefits and experiences, (2) superior competencies, (3) performance quality. The current study's methodology is described quantitatively. A questionnaire has been used as a research instrument as part of a survey methodology. The findings of this study are expected to be useful in developing policy programs to enhance the quality of academic and nonacademic services in the Undergraduate (S-1) Guidance and Counselling Study Program, Faculty of Education, Universitas Negeri Medan.

Keywords: Stakeholders, Satisfaction, Guidance, and Counseling.

1 Introduction

In the history of its development since the Department of Educational Psychology and Guidance (hereinafter abbreviated as PPB) the Guidance and Counselling Study Program has been established simultaneously with the establishment of IKIP Medan in 1963. Initially this department was named the Department of Counselling Guidance under the auspices of the Faculty of Education (FIP) together with the Department of General Education, Social Education and the Department of Educational Administration.

Since the 2000s the need for guidance and counselling teachers in the field has increased, marked by the passing of Law number 20 of 2003 concerning National Education System which confirms that one of the qualifications of educators in educational units is a BK/Counselor teacher. Currently, PS BK FIP UNIMED increasingly exists to carry out its role as a study program that produces professional BK teachers. This is confirmed by obtaining an A rating for study program accreditation through the Decree of BAN-PT Number 6721/SK/BAN-PT/Akred/S/X/2020.

An educational institution produces alumni. The quality of educational institutions is reflected in the quality of their alumni. It is not enough to simply examine the output, such as the ability to master knowledge, skills, and formal attitudes, as embodied in the Achievement Index, to determine the quality of graduates produced. However, it must also be determined from the accomplishment, namely the number of alumni who are able to find work. The relevance (suitability) of postgraduate education is demonstrated by the job description (category and location of work), the relation of the job to the educational background, the advantages of the study courses in the field of employment, and suggestion to improve graduate competencies. The accomplishment of university graduates in entering the workforce is one predictor of learning outcomes and the community relevance of university graduates. As a result, universities are fully accountable not only for having provided alumni with qualifications (learning outputs), but also for supporting and connecting graduates' entry into the workforce. Furthermore, the implications to education is demonstrated by graduates' personal views about their satisfaction, knowledge
and skills, and suggestion to improve graduates’ professionalism. The graduates can trace how far the higher education alumni are eligible to participate in advancement relevancy of their academic learning (Tracer Study).

The guidance and counselling program at Medan State University's Faculty of Education plays an important role in human resource development. One of the success criteria for the Guidance and Counselling program is the production of quality graduates with qualifications in their areas of expertise, so that they can start providing advantages for job seekers and be marketable. In job opportunities, graduates of guidance and counselling programs have the benefit of being able to implement elements of educational services in gaining awareness, skill sets, and behaviors. The effect of graduates' expertise on the workplace includes promotions, pay rises, accomplishment awards, and employment services and facilities. The graduates of the guidance and counselling program are bound to enhance their self-development abilities (highly developed analyses), leadership qualities, and teaching abilities in accordance with the performance quality.

Alumni can measure and track the performance of graduates through traceability in order to acquire clear examples about the profile of graduates. According to Schomburg (2003), tracer studies have been included among the university's quality assurance system. Tracer studies are now becoming crucially influential because they can offer valuable insight into the process of universities, serve as a resource to analyze the significance of academic institutions to the job market, as well as provide constructive insight for faculty members and management staff to optimize effectiveness.

Given the content above, an investigation was performed on the satisfaction of alumni from the Faculty of Education's Undergraduate Guidance and Counselling. In this study, the satisfaction of alumni users was assessed based on (1) the welfare and learning processes; (2) graduate expertise; and (3) performance.

2 Research Methods

The descriptive approach was used in this study to gain an overall picture of graduate users’ satisfaction levels. A questionnaire has been used as a research instrument in a survey method to collect scientific data. The study’s participants were 35 people who were active users of Guidance and Counselling graduates from the Faculty of Education at Medan State University.

The Graduate User Questionnaire was used as survey tool, which was created by the Research Team derived from the previous studies and needs analysis. The instrument's lattice is shown below.

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Benefits of learning experience</td>
<td>1.1 Knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2 Skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3 Attitude</td>
</tr>
<tr>
<td>2.</td>
<td>Competence of graduates</td>
<td>2.1 Compatibility of competence with job needs</td>
</tr>
<tr>
<td>3.</td>
<td>Performance Quality</td>
<td>3.1 Self-development</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2 Leadership</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.3 Innovative behavior</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.4 responsibility</td>
</tr>
</tbody>
</table>

Using Microsoft Office Excel, the collected data are compiled and subjected to statistical analysis. Since this online questionnaire did not require participants to complete the questionnaires, there were a few that were left unanswered. There are also survey questionnaire
that do not include the intended participants. As a result, the data analysis are all valid and incoming data (data from non-respondent fillers are not processed). The analysis results are shown in of a report containing statistical information that is then organized descriptively.

3 Result and Discussion

This section describes the satisfaction of graduate users (alumni superiors) with the alumni of the Guidance and Counseling Program at Universitas Negeri Medan who work under the institution they lead. The data collected in this tracer study were 35 respondents using alumni.

Benefits and Learning Experience

The benefits and learning experiences at the Guidance and Counseling Program in this study include the variables of knowledge, skills and attitudes of alumni perceived by superiors (leaders) where alumni work. The following table illustrates the benefits and learning experiences gained by the alumni’s of the Guidance and Counseling Program of the faculty of education, Medan State University.

<table>
<thead>
<tr>
<th>Sub-Variable</th>
<th>Indicator</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge</td>
<td>1.1 Academic ability</td>
<td>25</td>
<td>71.4</td>
</tr>
<tr>
<td>2. Skills</td>
<td>Peer communication</td>
<td>23</td>
<td>65.7</td>
</tr>
<tr>
<td></td>
<td>superior communication</td>
<td>26</td>
<td>74.3</td>
</tr>
<tr>
<td></td>
<td>Subordinate communication</td>
<td>22</td>
<td>62.9</td>
</tr>
<tr>
<td></td>
<td>Communication in the forum</td>
<td>24</td>
<td>68.6</td>
</tr>
<tr>
<td></td>
<td>Technology utilization</td>
<td>23</td>
<td>65.7</td>
</tr>
<tr>
<td></td>
<td>Utilization of facilities/media</td>
<td>26</td>
<td>74.3</td>
</tr>
<tr>
<td>3. Attitude</td>
<td>3.1 independence</td>
<td>25</td>
<td>71.4</td>
</tr>
<tr>
<td></td>
<td>3.2 Confidence</td>
<td>24</td>
<td>68.6</td>
</tr>
</tbody>
</table>

Based on the table above, it can be explained that in the knowledge sub-variable (academic ability or knowledge gained) as many as 25 respondents (71.4%) stated very well, indicators of ability to communicate with superiors were 23 respondents (65.7%) stated very well. On the indicator of the ability to communicate with colleagues as many as 26 respondents (74.3%) stated that it was very good. Indicators of the ability to communicate with subordinates, as many as 22 respondents (62.9%) stated very well, Indicators of ability to communicate in formal/informal forums, 24 respondents (68.6%) stated very good, Indicators of skills using technology 23 respondents (65.7%) said it was very good, the indicators for the use of media or work facilities, 26 respondents (74.3%) said it was very good.

In the attitude sub-variable with independence indicators as many as 25 respondents (71.4%) stated very well, self-confidence indicators 24 respondents (68.6%) stated very good.

In general, respondents stated that the benefits and learning experiences at PSBK UNIMED obtained by alumni were very well; there were no respondents who stated that they were not good. The findings in this study indicate that aspects of the learning experience that are considered to provide a positive experience while studying at PSBK UNIMED are independent learning, and the course material is felt to provide a lot of positive learning experiences, as well as the quality of the services provided by of the Guidance and Counseling Program of the faculty of education, Medan State University. The learning experience for graduates is improving.
academic abilities, improving communication skills not only in the work environment but in formal forums. Furthermore, the attitude of independence and self-confidence is increasing because of the impact of the learning experience while at the Guidance and Counseling Program of the faculty of education, Medan State University.

Competence of graduates

The following table describes the percentage of graduate user satisfaction in terms of graduate competence, including: (1) current and required competencies in work, (2) language skills, (3) the impact of competence on the field of work.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mastery of the field of science studied at PS BK UNIMED</td>
<td>27</td>
<td>77.1</td>
</tr>
<tr>
<td>2. Knowledge of other fields of science</td>
<td>26</td>
<td>74.3</td>
</tr>
<tr>
<td>3. Think</td>
<td>28</td>
<td>80.0</td>
</tr>
<tr>
<td>4. Ability to gain new knowledge quickly</td>
<td>28</td>
<td>80.0</td>
</tr>
<tr>
<td>5. Ability to negotiate effectively</td>
<td>27</td>
<td>77.1</td>
</tr>
<tr>
<td>6. Ability to perform well under pressure</td>
<td>27</td>
<td>77.1</td>
</tr>
<tr>
<td>7. Sensitivity to new opportunities</td>
<td>26</td>
<td>74.3</td>
</tr>
<tr>
<td>8. Ability to coordinate activities</td>
<td>28</td>
<td>80.0</td>
</tr>
<tr>
<td>9. Ability to empower others</td>
<td>28</td>
<td>80.0</td>
</tr>
<tr>
<td>10. Ability to use computer and/or internet</td>
<td>27</td>
<td>77.1</td>
</tr>
<tr>
<td>11. Ability to solve problems</td>
<td>27</td>
<td>77.1</td>
</tr>
<tr>
<td>12. Have a new idea</td>
<td>26</td>
<td>74.3</td>
</tr>
<tr>
<td>13. The ability to judge one's own ideas or those of others</td>
<td>28</td>
<td>80.0</td>
</tr>
<tr>
<td>14. Ability to present ideas, results, or reports</td>
<td>28</td>
<td>80.0</td>
</tr>
<tr>
<td>15. Ability to write activity reports (research, projects, etc.)</td>
<td>28</td>
<td>80.0</td>
</tr>
</tbody>
</table>

\[ \times 27.26 \quad 77.88 \]

In the table above, it is explained that the competence of graduates with indicators of mastery over the fields of knowledge studied by 27 respondents (77.1%) of alumni users stated that PSBK UNIMED alumni were in the very good category. Indicators of knowledge in other fields of science as many as 26 people 74, 3% said very well. Critical thinking indicators as many as 28 people (80%) stated very well. The indicator of the ability to get knowledge quickly as many as 28 people (80%) stated that it was very good. Then on the indicator of the ability to negotiate effectively as many as 27 respondents (77.1%) stated that it was very good.

Furthermore, on the indicator of ability to perform well under pressure, 27 respondents (77.1%) stated that alumni’s of the Guidance and Counseling Program were in the good category. The indicator of sensitivity to new opportunities as many as 26 people (74.3%) said it was very good. The indicator of the ability to coordinate activities as many as 28 people (80%) stated that it was very good. The indicator of the ability to empower others as many as 28 people (80%) stated that it was very good. The indicator of the ability to use computers and/or the internet as many as 27 people (77.1%) stated that they were very good.

Then on the indicator of ability to solve problems as many as 27 respondents (77.1%) stated very well. On the indicator of having a new idea as many as 26 people (74.3%) said it was very good. The indicator of the ability to assess their own ideas and those of others as many as 28 people (80%) stated that they were very good. The indicator of the ability to present ideas and/or report results as many as 28 people (80%) stated that they were very good. The indicator of the ability to write activity reports as many as 28 people (80%) stated that they were very
good. Finally, the indicator of writing and speaking in a foreign language as many as 30 respondents (85.7%) said it was very good.

From the description and contents of the table above, it can be concluded that in general the respondents using alumni stated that the competence of the graduates’ of Guidance and Counseling Program was very good. Graduate competencies, both conceptually and practically, are very important. Having competence means that it will be a capital for someone to achieve excellence in their work. Competence began to be applied in the field of education along with the discovery of Benjamin S. Bloom and his colleagues who published their results regarding the level of thinking, acting, and behaving as educational processes and products. Competence in the educational perspective as developed by Bloom, Krathwohl, and Masia (1964) includes three things: (1) cognitive-based education; (2) affective-based education; and (3) psychomotor-based education.

**Performance Quality**

Data on the quality of graduate performance perceived by stakeholders as a variable measured in this study consists of the following sub-variables:

<table>
<thead>
<tr>
<th>Sub-Variable</th>
<th>Indicator</th>
<th>( f )</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-development</td>
<td>Interest in Further Studies</td>
<td>25</td>
<td>71.4</td>
</tr>
<tr>
<td></td>
<td>Training Interest</td>
<td>26</td>
<td>74.3</td>
</tr>
<tr>
<td>Leadership</td>
<td>Planning</td>
<td>27</td>
<td>77.1</td>
</tr>
<tr>
<td></td>
<td>Management</td>
<td>26</td>
<td>74.3</td>
</tr>
<tr>
<td></td>
<td>Monitoring and Evaluation</td>
<td>25</td>
<td>71.4</td>
</tr>
<tr>
<td>Innovative Behavior</td>
<td>Giving Ideas and Suggestions at work</td>
<td>28</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>Ideas and Suggestions Accepted</td>
<td>27</td>
<td>77.1</td>
</tr>
<tr>
<td></td>
<td>Doing Innovative Things</td>
<td>26</td>
<td>74.3</td>
</tr>
<tr>
<td>Responsibility</td>
<td>Timely Completion of Tasks</td>
<td>28</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>Good Quality Work Hasil</td>
<td>22</td>
<td>62.9</td>
</tr>
</tbody>
</table>

\[ \times 26 = 74.28 \]

In the self-development sub-variable with indicators of interest in further studies, 25 respondents (71.4%) stated that it was very good. In the indicator of interest in participating in the training, 26 respondents (74.3%) stated that it was very good. Then the leadership sub-variable on planning indicators A total of 27 respondents (77.1%) said it was very good, 27 respondents (77.1%) said it was very good, 26 respondents (74.3%) said it was very good, monitoring and evaluation indicators as many as 25 respondents (71.4%) said it was very good.

Furthermore, on the sub-variables of innovative behavior in the indicators of providing ideas and suggestions in work, 28 respondents (80%) stated that they were very good, on the indicators of ideas and proposals received as many as 27 respondents (77.1%) stated very well, On indicators doing innovative things as many as 26 respondents (74.3%) stated very well.

In the responsibility sub-variable with indicators for completing assignments on time, 28 respondents (80%) said very good, 22 respondents (62.9%) said very good, and 24 respondents (68.6) said they were very good. %) stated very well.
4 Conclusion

Summary of the results and discussion above, it is reasonable to suggest that alumni users are generally satisfied with the alumni of the guidance and counseling program. In the variable of learning benefits, the average alumni user (69.14%) stated very well, the graduate competency variable, the average alumni user (77.88%) stated very good, then on the variable quality of graduate performance the average alumni user (74.28%) stated very well. Some aspects that are considered not optimal by graduate users are used as input for curriculum improvement, mainly aligning graduate learning outcomes with job demands.

References

Development Of Animation Video Learning Media Based on Adobe Premiere Pro in Civic in Primary School

Feriyansyah, Apiek Gandamana, Waliyul Maulana Siregar, Monika Artauli Nainggolan
{feriansyach@unimed.ac.id}

Faculty of Education, Universitas Negeri Medan-Indonesia

Abstract This research on the development of learning media based on Adobe Premiere Pro is based on problems when the teaching and learning process takes place, teachers still rarely use learning media in the form of animated videos but instead use learning media in the form of image media at SDN 173405 Sosorgonting. The purpose of this study is to determine the feasibility, practicality and effectiveness of Adobe Premiere Pro based animate video learning media on civic content. The type of research used is research and development using ADDIE. The result of the validity test through a questionnaire by a material expert are carried out in two stages with the acquisition of 60% in the first stage and 90% in the second stage. The result of the practicality test obtained from the teacher’s response questionnaire with a percentage of 96% and student responses with a percentage of 88% so it can be concluded that the Adobe Premiere Pro based animated videos learning media in 6th grades SDN 173405 Sosorgonting is very feasible and practical to use in the learning process. The result of the effectiveness test by conducting pre-test and post-test with an average value of 85 so that learning outcomes have increased by 37%

Keywords: Animated Video Learning Media, Adobe Premiere Pro

1 Introduction

Technological developments in the era of globalization have an impact on the development of education. The development of science and technology has given birth to innovations in new science. The impact of globalization today not only affects technology and science, but also affects the characteristics and learning styles of modern society. Therefore, it is not surprising that students are proficient in technology at a very young age, and to respond to the character of today's students, teachers as educators must be able to adapt and design learning models that are in accordance with the characteristics of today's society.

Education is the main thing that is needed by everyone because education is also referred to as a very important activity in the continuous development of human resources which is a basic need for all future generations of the nation who want to progress. of the rapid development of technology today. The role of technology is very important in gaining knowledge, work and interaction. The government and society are very concerned about technological progress, because the government and society understand the role and benefits of technology in everyday life. The learning system should have been more advanced than the
previous era. One way to anticipate learning innovation is to use technology-based learning media as a tool in the teaching and learning process. The use of technology has become a demand for teachers in the learning process as a form of professionalism of a teacher because as a teacher must have the skills to create creative, diverse and meaningful learning media so that the designed learning objectives can run as expected.

In the learning process, teachers are required to create active and creative learning, so as to attract the attention of learning. Therefore, teachers need to provide learning resources, one of which is learning media. Learning media is a means to provide information and teaching materials from teachers to students in the teaching and learning process. Anything that can be used to stimulate thoughts, feelings, attention and learning abilities or skills to drive this process. The learning media used are not only in the form of print media, but also in the form of non-print media such as audiovisual-based learning media which is a medium for delivering messages through the use of hearing aids and hearing aids. In general, according to Edgar Dale's theory, the influence of audiovisual media is higher than visual or audio media alone.

However, the reality in the field when researchers make observations, the learning media currently used in grade 6 SDN 173405 Sosorgonting still often uses printed media such as thematic books and simple learning media such as pictures and writing during Civics lessons. When learning Civics, the teacher uses the lecture and question and answer method which causes students to feel bored quickly with learning. The lack of creative and diverse learning media makes students less active, less interested and less involved in the learning process. The inability to understand the learning of students' attention is represented by the difficulty of students in understanding the material presented by the teacher, therefore learning media is a very important requirement for teachers and students in the learning process.

In addition to the above data, based on the results of interviews that the author conducted with the 6th grade teacher at SDN 173405 Sosorgonting, it produced some data, namely: In the teaching and learning process teachers rarely use learning media in the form of animated videos, but use learning media as media images made by pasting pictures on cardboard which are less able to involve students in learning and also very monotonous. The use of image media is not done every day by the teacher and sometimes only uses the thematic package books that are available to teachers and students, so that students are less focused in understanding the subject matter presented by the teacher.

Based on the above problems and the needs of the SDN 173405 Sosorgonting school being studied, the researchers took the initiative to provide a solution, namely the need for the availability of learning media in the form of Adobe Premiere Pro-based animation videos which became one of the alternative learning methods to help students understand the learning material. The reason the researcher uses this base is because Adobe Premiere Pro is a video editing application that can be used by beginners or expert editors. The expected result by developing learning media using Adobe Premiere Pro is that students quickly understand the message of the subject matter delivered through animated videos because the use of media can make the quality of learning even better.

2 Research Methods

The method used in this research is Research and Development and the research model used is the ADDIE development model with 5 stages including the analysis, design, development, implementation, and evaluation stages with the aim of producing and developing products by conducting trials to determine the effectiveness and practicality of the product. This
type of research used qualitative and quantitative data analysis techniques. Qualitative data is data obtained from observations and interviews with teachers. This quantitative data can be obtained from the validation results through a questionnaire by media experts, material experts, 6th grade elementary school teachers and students using a Likert scale assessment.

The data collected was then analyzed to determine the results of the validity, effectiveness and practicality of the learning media that had been developed.

The analyzes used include:

a. Validity Analysis
   The average score of the assessment of learning media is obtained by the formula:
   $$\frac{\text{jumlah skor yang diperoleh}}{\text{jumlah skor maksimal}} \times 100\%$$

   The data obtained from the validity test conducted to the validator on the validity of the animated video learning media by paying attention to important aspects in the development of animated video learning media. Data analysis was measured using a Likert scale. There are 30 questionnaire questions to be validated to media experts, and 10 questionnaire questions to be validated to material experts. The percentage obtained will be used as a reference to state the validity of the animated video learning media.

b. Practical Analysis
   The average score of the assessment of the practicality of learning is obtained by the formula:
   $$\frac{\text{jumlah skor yang diperoleh}}{\text{jumlah skor maksimal}} \times 100\%$$

   The results of the practicality test of the developed learning media can be seen by paying attention to the practicality criteria of the media that have been set so that the learning media can be said to be practical if it meets the practicality criteria. The data obtained from the practicality test can be collected by using student response questionnaires and education practitioner response questionnaires given by 6th grade students and teachers at SDN 173405 Sosorgonting. Data analysis was measured using a Likert scale. In the student response questionnaire, there are 20 questions and in the education practitioner response questionnaire there are 10 questions.

c. Effectiveness Analysis
   The average score of the assessment to determine the effectiveness of learning media is obtained by the formula:
   $$\frac{\text{jumlah skor yang diperoleh}}{\text{jumlah skor maksimal}} \times 100\%$$

   The data obtained from the effectiveness test can be collected by giving pretest and posttest questions in order to see student learning outcomes before and after using the media. Data analysis was measured using a Likert scale. In the pretest and posttest questions, there are 10 multiple choice questions and 5 fill-in questions. The percentage of average scores obtained from 23 students will be used as a reference to state the effectiveness of the animated video learning media used in the study.

3 Results And Discussion

The process in developing Adobe Premiere Pro-based animated video learning media using the ADDIE model consists of the Analysis, Design, Development, Implementation and Evaluation stages. At the analysis stage with several stages of analysis including (1) Needs analysis was carried out by interviewing the 6th grade teacher at SDN 173405 Sosorgonting about problems that often occur in the teaching and learning process. (2) Analysis of learning
tools regarding the learning tools used and (3) Analysis of curriculum and material needs and (5) Analysis of students.

At the design stage, the researcher prepares the material to be presented in the animated video and prepares a design for the visualization of this Adobe Premiere Pro-based animation video learning media. Then the researcher also made an instrument in the form of a questionnaire that would be used for the process of testing the validity of media experts and material experts in order to get an assessment of the feasibility of animated video learning videos so that they could be used during research.

At the development stage, the researcher used Adobe Premiere Pro software which was carried out according to the design. After that the animated video was validated to media and material experts in order to develop what was lacking from the animated video learning media. At the stage of implementing the Adobe Premiere Pro-based animated video learning media, research was carried out in class 6 SDN 173405 Sosorgonting with a total of 23 students. Researchers tested learning products using Adobe Premiere Pro software that has been developed to measure the practicality and effectiveness of using animated videos as learning media.

At the evaluation stage, it aims to provide feedback to the media users. The instrument used in this study was a questionnaire to test the validity of learning media, a questionnaire instrument for teacher and student responses to test the practicality of learning media, as well as learning outcomes obtained using pre-test and post-test.

The following are the results of the validity, practicality and effectiveness of the Adobe Premiere Pro-based animated video learning media

a. Media Expert Validation Results

![Fig 1. Diagram of media expert validation assessment results](image)

Based on Figure 1 above, the results of media validation are obtained, there is a percentage score of 84% with the criteria of "Very Good" with a feasibility level of "Very Eligible", therefore this media is suitable for use on students.

b. Validation Results of Material Experts I and II

![Fig 2. Diagram of Material Expert Assessment Results I and II](image)
Based on Figure 2 above, the results were in stage I the criteria are "Not Good" with a feasibility level of "Enough Eligibility" with a percentage of 60%. In stage II, it received the "Very Good" criteria with a "Very Eligible" eligibility level with a percentage of 90%, so that the material presented in this Adobe Premiere Pro-based animated video media was feasible to use.

c. Assessment Results of Education Practitioners

![Fig 3. Diagram of Education Practitioner Assessment Results](image)

Based on Figure 3, the assessment through student response questionnaires obtained a percentage of 96% and can be categorized as very practical to use in the teaching and learning process.

d. Effectiveness Assessment Results

![Fig 4. Diagram of Effectiveness Assessment Results](image)

Based on Figure 4, this effectiveness assessment can be seen from student learning outcomes and the responses given by students to the Adobe Premiere Pro-based animated video learning media that has been used.

Discussion

When they were at SDN 173405 Sosorgonting, the researchers conducted a pre-test to determine the students' abilities before using the Adobe Premiere Pro-based animated video learning media, after getting the results from the pre-test, the researcher then displayed an animated video to the students. Then after the students finished watching the animated video and understood the Civics subject matter regarding Rights, Obligations and Responsibilities, students were given post-test questions to get the results of students' abilities after using learning media. The questions distributed by the researcher consisted of 10 multiple-choice questions and 5 fill-in questions.

In addition to conducting pre-test and post-test, the researchers also distributed questionnaires to obtain effectiveness results. The effectiveness criteria are said to be good if students achieve complete KKM 75. The results at the pre-test stage get a percentage of 48%
and at the post-test stage get a percentage of 85%. At the pre-test stage, only one student achieved the KKM completeness score, at the post-test stage all 23 students achieved the KKM completeness. This proves that Adobe Premiere Pro-based animated video media has succeeded in increasing students' motivation and attention in learning so as to improve student learning outcomes and learning media are included in the "very feasible" criteria to use. The student questionnaire responses obtained a percentage of 88% and from the results of the questionnaire responses it can be stated that the animation video learning media based on Adobe Premiere Pro is very effectively used for the teaching and learning process.

This research is also supported by previous research, namely research conducted by M. Randek Sugianto in his 2018 thesis entitled "Development of Islamic Religious Education Learning Video Media for Faith Materials to Class VIII Apostles at Adabiyah Junior High School Palembang". This research has produced an interactive learning video product. Valid, effective and practical research. This research has gone through a good testing process in terms of validation, effectiveness and practicality.

Based on the results of the research on the development of the video, it concluded that the validity of the prototype of the results of the development of the learning video for the subject of Islamic Religious Education material Faith to the Apostles in class VII at SMP Adabiyah Palembang was tested valid. Based on the results of media experts, material experts have an average validation of 86%. The resulting learning video also has effectiveness, based on the post test and pro test, learning outcomes have increased from 65.51% before using the research product to 82.75% after using the research product. The practicality of the Islamic Religious Education learning video material Faith to the Apostles class VIII at SMP Adabiyah Palembang based on the results of the observation sheet when the teacher taught reached 96.66%.

4 Conclusion

This research was conducted because of the existing problems, namely rarely use animated videos in the learning process but still often use learning media in the form of image media. The process of making this animated video learning media uses the ADDIE model which consists of several stages, namely: (1) Stages of Analysis (Analyze), consisting of needs analysis, learning device analysis, curriculum and material analysis, and student analysis. (2) Design phase, consisting of preparation of lesson plans, storyboards, preparation of materials, preparation of questionnaire instruments. (3) The Development Phase consists of the manufacture and development of products, validation of media experts and material experts. (4) Implementation phase, consisting of field trials. (5) The Evaluation Stage consists of an assessment of each product from each stage and the final product of the media developed after revision.

As for the validity test assessment by media experts 84% and by material experts 90% so that it is categorized as very feasible to use, then the feasibility value of education practitioners gets a percentage of 96% so it is categorized as very feasible. The results of the test of the effectiveness of this animated video learning media with a total of 23 people using the pre-test and post-test stages of student learning outcomes which have increased where at first only 1 student completed the KKM (4.5%) to 23 students who completed the percentage by 37%. The responses obtained from students' responses were 88% who stated that the animation video learning media based on Adobe Premiere Pro was very effective for use in the teaching and learning process.
References

Development of an Inquiry-Based E-Module Assisted by Google Classroom to Improve Learning Outcomes of Class XI Social Students at SMA WR Supratman 1 Medan TP 2021/2022.

Evi Deristina Sinaga¹, Dede Ruslan², Muhammad Fitri Rahmadana³
{evidsinaga@gmail.com}

Economic Education Study Program, Postgraduate Program Universitas Negeri Medan²³

Abstract. The purpose of this research is to develop an inquiry-based e-module that can improve student learning outcomes. Research and development (R&D) of the ADDIE model with qualitative and quantitative analysis techniques. The results of the study indicate that the development of e-modules with qualitative analysis, namely the results of material experts are 91 percent very good, results from media experts are 86 percent very good, the results of design experts are 93 percent very good, and the results of teacher responses are 95 percent very good. While the validation results from students were carried out three times, namely the individual test 95 percent very good, the small group test 95 percent very good, and the large group test 97 percent very good. After the product has been successfully developed, then experimental research, namely the use of inquiry-based e-modules effectively improves student learning outcomes with a one-way t-test, the value becomes 0.000 which means less than = 0.05 so it can be concluded that the posttest value of the experimental class is greater compared to the control class posttest scores, so it can be concluded that the inquiry-based e-module development is effective in improving student learning outcomes.

Keywords: E-Module Development, Inquiry, Learning Outcomes

1 Introduction

One strategy that a teacher can do is make teaching materials. Teaching materials are materials in the form of information, tools, and textbooks that are arranged systematically based on the competencies that students will learn and use in the learning process to understand and implement to achieve learning objectives (Prastowo, 2013). One form of teaching materials that is very important to be developed at this time is the module. Prastowo (2013) module is a set of teaching materials that are made systematically and directed so that their use can be understood without a teacher. Module teaching materials can help students understand the learning material more easily when the teacher explains it again and even students are also able to understand the learning material even if it is not explained by the teacher. In line with the development of technology, the modules used in the learning process are growing and innovating, for example teaching materials from print modules to electronic modules or often referred to as e-modules.
Teaching materials in the form of e-modules in this current era should be used in the learning process by every teacher. Of course, it has become a demand for technological developments that can make it easier for students to learn, for example when studying at school using a smartphone or computer. On the other hand, learning can also be carried out using a distance system (online) as a form of using technology, especially in current learning which is still online due to the COVID-19 pandemic which makes learning activities still online.

Based on a needs analysis conducted by researchers at the Private High School WR Supratman 1 Medan, it was found that the teacher of economics subjects when delivering learning materials still focused on printed books distributed from schools, teaching materials like this were not optimal to meet the needs of students. For teaching materials in the form of e-modules, it is not yet available, even in online learning situations like now, economics teachers only deliver lecture material through the zoom application and assignments via Google Classroom, even though the learning process like this is less interesting, students get bored easily, and tend to be passive. Furthermore, students do not understand the economics learning material, especially the material that is calculated. Reading printed books from school, students also do not understand because the explanations in the book are incomplete and the language is difficult for students to understand. Students also said that online economics learning never applied a learning model, so teachers were considered less creative in delivering learning.

Therefore, researchers are interested in developing economic learning e-modules to support more effective and efficient learning activities in online learning today. The e-module that will be developed by the researcher is an e-module in the form of a flipbook. Furthermore, the pattern of e-module development uses an inquiry model as a form of student-centered learning and also a learning model that developed in the 21st century. Sutrisno (2008) suggests that the inquiry learning model is to instill the foundation of scientific thinking in students, so that in this learning process students can learn more on their own and develop problem-solving creativity. In the learning process at school, researchers use the help of the google classroom application to test the products developed. This is done because students often use the Google Classroom application in online learning activities.

**E-Module Development**

According to Priyanti (2007) e-modules are teaching materials in electronic form that can be read on computers or other technological applications designed with the required software. According to Limatuhu (2017) e-modules are learning that can be implemented as independent learning resources that can help students improve their competence or cognitive understanding. Meanwhile, Suarsana and Mahayukti (2010) e-module is a technology-based module that is interactive, which contains images, audio, video and animation for display, and is equipped with exercises or evaluations. So it can be concluded that e-modules are electronic media that can be studied anytime and anywhere as a source of independent learning equipped with video, audio and animation that can make the learning process more interesting.

**Inquiry Learning Model**

According to Triantin (2011) inquiry means an examination or investigation question. Meanwhile, Alberta (2004) believes that inquiry learning is a process in which students learn, ask questions, conduct extensive research, and then build new understanding, understanding, and knowledge. It can be concluded that the inquiry model is a student-centered teaching that requires students to process messages so that they acquire everything that is known, skills, and values that can make learning more meaningful and can improve student learning outcomes. Sanjaya (2012) describes the steps of inquiry learning as follows:
1. Orientation
The orientation step is an interactive method used in responsive learning so that students are ready to carry out the learning process, explaining topics, objectives and learning outcomes that must be carried out by students to achieve learning goals.

2. Formulate the problem
The step of formulating the problem is a step that brings students to problems that contain puzzles. The problems presented are problems that challenge students to think and try to solve the puzzle.

3. Propose a hypothesis
The hypothesis step is a step that contains a temporary answer to a problem that is being studied. It is a provisional answer, a hypothesis that needs to be tested for truth.

4. Collecting data
The step of collecting data is a step in the form of activities to collect the information needed to test the hypothesis that has been proposed.

5. Test the hypothesis
In the step of testing the hypothesis, it means that the step in the form of a process of determining the answer that is considered acceptable according to the data or information obtained based on data collection.

6. Formulate conclusions
In the step of formulating a conclusion, it means that the step in the form of a process of describing the findings obtained based on the results derived from hypothesis testing.

Google Classroom app
The Google Classroom application is a platform application that is used for the learning process online learning. This application was originally designed on a web-based basis that can be used for online learning for students as well as students. Along with the times, this application can also be used through mobile learning which makes it easier for students to use this application in the learning process, this is also because the average student already has a mobile phone as a learning support. This is also supported as part of technological developments that can be used in the field of education as a learning process that is easy to use anytime and anywhere. In addition, this application is also very supportive in online learning at this time due to the pandemic which has resulted in schools having to implement online learning.

Economics Learning Materials
Development of inquiry-based e-modules assisted by Google Classroom for tutors Economics lessons at WR Supratman Private High School, Medan for class XI Social Sciences for the academic year 2021/2022 are in accordance with the odd semester economics subject matter in the 2013 curriculum economics syllabus, namely basic competencies in analyzing concepts and methods of calculating national income, and presenting the results of calculating national income. The learning indicators developed in the e-module are:

a. Understand the meaning of national income
b. Understanding the benefits of national income
c. Analyzing the components/concepts of national income
d. Analyzing the method of calculating national income
e. Explain the concept of income per capita
f. Understand the concept of income distribution
g. Make a pattern of the relationship of information/data obtained to conclude about the concept and method of calculating national income.
2 Research Methods

This research is a research and development (R&D) with the ADDIE model that develops teaching materials for economics subjects, namely inquiry-based e-modules for students of class XI social studies. The purpose of this development research is to determine the feasibility and effectiveness of inquiry-based e-module development to improve student learning outcomes. This research was carried out at SMA WR Supratman 1 Medan for the academic year 2021/2022 on economics class XI social studies. This research is planned to be carried out in August 2021 which will be adjusted to the school calendar. The technique of collecting data is through observation and validation questionnaires from media experts, design experts and material experts. Furthermore, the teacher's response questionnaire, and student response questionnaires for up to three groups and followed the stages of research on the development of the ADDIE model.

3 Results and Discussion

The development of e-modules has been developed starting from the stage of analyzing the needs of students and teachers, designing and designing the e-module framework, product validation by experts by three experts, namely material experts, design experts and media experts as well as teacher response questionnaires and given improvements/revisions to the product. Then it goes into individual product trials, small group and large group product trials and field revisions to produce e-modules that are suitable for use in the learning process.

In developing inquiry-based e-module products on economics subjects for class XI IPS, there has been a revision from material expert lecturers, namely the need to add case examples to enrich the discussion and apply and add the latest data in the e-module. The revisions from the media expert lecturers were adjusting the background color with the text color, replacing the learning video with its own video, clarifying the appearance of the e-module writing. The two suggestions from the expert validation have been improved and can be carried out to the next stage.

For the results of inquiry-based e-module validation from material expert validation, the indicator of the suitability of the material description aspect to competence has an average percentage of 90 percent with very good criteria. The indicator for the accuracy of the material has an average percentage of 100 percent with very good criteria. The indicator for the presentation of inquiry-based material has a percentage of 92 percent in the very good category. The indicator of the presentation technique aspect has a percentage of 92 percent in the very good category. The indicator of the completeness aspect of the presentation of the section has a percentage of 87 percent with a very good category. The average percentage of all indicators is 91 percent in the very good category. This means that the inquiry-based economics E-module in economics class XI developed is feasible to be tested in the field.

For the results of inquiry-based e-module validation from media expert validation, namely the programming aspect indicators have an average percentage of 87 percent with very good criteria. The indicator for the feasibility aspect of the content of the E-Modul has a percentage of 85 percent with very good criteria. The average percentage of all indicators is 86 percent with a very good category. This means that the inquiry-based E-Module in economics class XI developed is feasible to be tested in the field.

While the results of inquiry-based e-module validation from design expert validation, namely the preliminary aspect indicator has an average percentage of 90 percent with very good
criteria. The indicator of the objective aspect (learning outcomes) has an average percentage of 95 percent with very good criteria. The final test aspect indicator has an average percentage of 95 percent with very good criteria. The indicator of the learning experience aspect has an average percentage of 90 percent with very good criteria. The indicator of the learning resource aspect has an average percentage of 93 percent with very good criteria. The average percentage of all indicators is 93 percent with very good criteria. This means that the inquiry-based E-Module developed is worthy of field trials.

For the validation of the inquiry-based e-module from the teacher's questionnaire, the average score of 95% was obtained for the feasibility of the e-module and was in the very good category. The results of the individual test of the inquiry-based e-module obtained an average score of 95% for the feasibility of the e-module and is in the very good category. Meanwhile, the results of the small and large group test questionnaires for student responses were in the very good category. Thus, the inquiry-based e-module assisted by Google Classroom in economics has met the feasibility element and can be applied in student learning activities.

After the e-module product meets the feasibility element, then the product is implemented to determine the effectiveness of the e-module. Prior to the implementation of the e-module, a pretest was first conducted for the two sample groups that had been determined, namely class XI IPS1 was referred to as the experimental class, while class XI IPS2 was referred to as the control class. Each of the two sample classes was given the same pretest questions, namely 20 multiple choice questions. The results of the pretest and posttest are presented in the table below:

<table>
<thead>
<tr>
<th>No.</th>
<th>Class</th>
<th>Average Pretest Score</th>
<th>Average Posttest Score</th>
<th>KKM Achievement &gt; 65 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Experiment Class</td>
<td>53</td>
<td>79</td>
<td>100%</td>
</tr>
<tr>
<td>2.</td>
<td>Control Class</td>
<td>52</td>
<td>62</td>
<td>46.67%</td>
</tr>
</tbody>
</table>

Based on table 1 above, the pretest results of the experimental class students have an average score of 53. Meanwhile, the control class has an average score of 52. From the table, the difference between the average scores of the experimental class and the control class is not much different. After the pretest was carried out, the two samples were treated differently, namely the experimental class using an inquiry-based e-module that had been developed, while the control class was only given the treatment of economic class XI social studies textbooks given by the school to students.

The posttest results show the average value of the experimental class is 79 with a KKM achievement of 100%, while the average score for the control class is 62 with a KKM achievement of 46.66%. Therefore, students in the experimental class had higher learning outcomes than the control class.

For the prerequisite analysis test, then the two samples were tested for normality to find out whether the two samples came from data that were normally distributed. With the help of the following SPSS applications, they are presented in the table below:
Table 2. Normality Test for Experiment Class and Control Class

<table>
<thead>
<tr>
<th>Class</th>
<th>Data</th>
<th>Sig</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Experiment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>0.200</td>
<td>0.05</td>
<td>Normal Distributed Data</td>
</tr>
<tr>
<td>Posttest</td>
<td>0.108</td>
<td>0.05</td>
<td>Normal Distributed Data</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>0.166</td>
<td>0.05</td>
<td>Normal Distributed Data</td>
</tr>
<tr>
<td>Posttest</td>
<td>0.122</td>
<td>0.05</td>
<td>Normal Distributed Data</td>
</tr>
</tbody>
</table>

From table 2 above, it shows that the results of the pretest and posttest data for the experimental class and control class have a probability value > 0.05, the experimental pretest data is 0.200 > 0.05, the experimental posttest data is 0.108 > 0.05, the control pretest data is that is 0.166 > 0.05 and the control posttest data is 0.122 > 0.05. Thus it can be concluded that the results of the pretest and posttest of the two classes are normally distributed. Furthermore, the homogeneity test is presented in the table below:

Table 3. Homogeneity Test

<table>
<thead>
<tr>
<th>Levene Statistics</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>.797</td>
<td>3</td>
<td>120</td>
<td>.498</td>
</tr>
</tbody>
</table>

Table 3 above shows the results of the homogeneity test using the Levene method, the significance value of the experimental pretest and control pretest results is 0.498. Therefore, the sig value of 0.498 > 0.05, it can be concluded that the two samples of the experimental class and control class are homogeneous. Furthermore, to test the hypothesis using the Independent Samples Test, namely the sig.2-tailed value of 0.000 then the value is divided into two because the t-test is carried out in one direction, the value becomes 0.000 which means less than = 0.05 so it can be concluded that the posttest value the experimental class is greater than the posttest value of the control class.

4 Conclusion

The inquiry-based e-module development has been developed through the ADDIE development model. This e-module has been developed starting from the stage of analyzing the needs of students and teachers, designing and designing the e-module framework, product validation by experts by three experts, namely material experts, design experts and media experts as well as teacher response questionnaires and given improvements/revisions to the product. For the results of inquiry-based e-module validation from material expert validation, namely 91 percent in the very good category, media expert validation 86 percent in the very good category, validation by design experts 93 percent with very good criteria. For the validation of the teacher's response questionnaire, the results obtained an average score of 95% in the very good category, the individual test average score of 95%, and the results of the small and large group test of student responses obtained an average result of 97 percent in the very good category. The inquiry-based e-module is quite effective in improving student learning outcomes with an average n-gain of 56.8%. Meanwhile, the average n-gain score for the control class is 20.5% in the ineffective category for improving student learning outcomes. This is in line with research (Sarah (2016)) the n-gain results show that the increase in student learning outcomes using inquiry-based modules (64%) is greater than students who study using conventional modules (56%). Another research that supports is Pratiwi (2019) guided inquiry-based module trials can improve student learning outcomes by 80%.
Acknowledgment
The author would like to thank all those who have helped and supported the researcher in completing this research. Hopefully the results of this research will be useful for many people, especially the authors and the place of research. The authors also thank the supervisors and validation lecturers who have provided input and suggestions for the perfection of this research.

References

Use Of Image Media in Strengthening Low Order Thinking Skills to Introduce Color In Early Childhood

Salsabila Hasiana Tanjung1, Kamtini2, Anada Leo Virganta3, Damaiwaty Ray4
{hasianasalsabila@gmail.com}
Universitas Negeri Medan, Indonesia1234

Abstract. Low order thinking skills in children aged 4-5 need to be stimulated and strengthened so that they can easily progress to more complicated thinking activities. Knowing color in early life is one of the cognitive development tasks that children must complete, thus it requires strong thinking abilities and the use of appropriate media in delivering stimulation. The purpose of this study is to determine the influence of picture media on improving children's LOTS ability to distinguish color. Quantitative methodologies and an experimental approach are used in the implementation of research. The data was analyzed using regression, and the children had a favorable reaction in the ability to distinguish color with the media and reinforcement utilized, with a result of 0.645. Children get more familiar with the image and alter it by memorizing, applying, and applying it to items in their environment.

Keywords: Children, Color, LOTS, Picture.

1 Introduction

Information processing is a process from encoding information to storing information and disclosing the search for information stored in memory (searching) when a child understands the concept of colour. Memory is an organized structure of information, and the search process is hierarchical, from the most general and detailed information to get the information you need. Recognizing children's colours is how the brain interprets them. When seeing colours from objects that are far or near in early childhood, it is necessary to focus and focus on the object being seen. Increases sharpness when viewing colours and objects. Early childhood and kindergarten need to pay attention to three things: discrimination (different attention between objects seen), integration (state of the visual meaning), and memory (movement and memory) [1].

The ability to recognize colours is one aspect of cognitive skills. Colour recognition in early childhood can stimulate brain perception, so the ability to recognize colours in early childhood is very important for brain development [2]. Colour exists in objects that are directly or indirectly exposed to sunlight and is also a visual sensitivity caused by the colours seen by the eye [3] [4]. Introduce colours to performances and train early childhood by naming and classifying colours. Based on this, the ability to recognize colour in children's cognitive development is one of the
processes that previously received information stimulated by the search process through coding, storage, and activity.

In this way, children can display colours, give names, and classify them [5]. But in reality, the colour recognition learning model is even less diverse. Colour is more often introduced in drawing activities and shows the colour of an object in the environment. Even if your child is very interested in colourful things, as a teacher, you need to maximize it by offering a more diverse learning model. Introducing colours takes a lot of fun for kids to learn. It is hoped that learning is important not only for fun learning but also for child development. Learning with visual media is one way to learn colour recognition in early childhood [6]. Image-to-image learning is learning that uses the role of paired images or images that are logically sequenced based on the learning objectives [7].

The picture and picture learning model is based on pictures as a medium for children's learning processes. The use of photography in learning leads to colour recognition and can inspire children to explore colours based on sensory perception [8]. The pictures provided are pictures that can be recognized and are around children. Because of some of the problems above, we need to dig deeper into variations in early childhood colour recognition learning. Therefore, the author wants to learn more about colour recognition in children.

**Recognize colors**

The ability to recognize colours is the ability of children to recognize colours by showing, mentioning, and classifying the colours referred to by the teacher through colour recognition activities. Recognizing colour is also an indicator of science in the field of cognitive development. By introducing colours to children, we can create cognitive structures. Children receive more information during the learning process, which leads to greater knowledge and understanding [9]. In this case, the child conceptually knows the colour of his learning experience. The colour recognition learning process needs to be linked with systematic learning. It must be measurable and observable when evaluating learning outcomes. Children can indicate colours by pointing and pointing with their fingers. This ability can be developed by learning the language and fine motor skills of children who understand colours. You may say that a child can pronounce and pronounce the colours he sees correctly, but this ability can be formed by learning a child's language with an understanding of colours, but children can do what children can do. can be collected, one of which is that this skill can be formed by children's language acquisition [10]. Understanding colour. The ability to colour, name, and classify children is the basis for the formation of early childhood cognitive skills.

**Low Order Thinking Skills**

LOTS is a student's functional thinking ability. Usually, students who apply the LOTS method will get information or learning material by copying, imitating, memorizing, remembering, and following directions from others [11]. Low order thinking skill is the ability to think about the memorization and basic stages. This thinking ability still relies on the brain's memory, not the brain's ability to think critically. Low order thinking skills are not the goal of our current education. It is not difficult to form low thinking skills. Children can easily memorize the theory and remember it. In addition, basic thinking skills are also much easier to have because the brain only needs to think about basic things that are not complex. The goal of education today is to form higher-order thinking skills [12]. Whatever the education system applied, children are expected to think critically and creatively. This higher-order thinking ability can actually make it very easy for students to absorb all the knowledge that is given to them.
LOTS is a student's functional thinking ability. Usually, students who apply the LOTS method will get information or learning material by copying, imitating, memorizing, remembering, and following directions from others [11]. Low order thinking skill is the ability to think about the memorization and basic stages. This thinking ability still relies on the brain's memory, not the brain's ability to think critically. Low order thinking skills are not the goal of our current education. It is not difficult to form low thinking skills. Children can easily memorize the theory and remember it. In addition, basic thinking skills are also much easier to have because the brain only needs to think about basic things that are not complex. The goal of education today is to form higher-order thinking skills [12]. Whatever the education system applied, children are expected to think critically and creatively. This higher-order thinking ability can make it very easy for students to absorb all the knowledge that is given to them.

2 Research Methods

This section describes the materials used and the proposed methodology. This research is semi-quantitative. The experimental method with group time-series test in pediatric care. The treatments in the time series test of this study were studies. The subjects used in this study were 150 children based on their age. Behaviour that occurs is assessed using indicators of the child's colour cognitive ability, depending on the cognitive aspects of children between the ages of 4 and 5 years, namely their ability to display, name, and classify colours.

These indicators are divided into processing, namely the function of detecting 13 colour changes (primary colour) and the function of detecting 15 colour changes (secondary colour). All actions shown are research data collected based on observations of researchers and teachers. The data obtained were analyzed using the Kruskal-Wallis test and regression test to find out how important the learning model used is in the differences in children's ability to recognize colours in SPSS.

3 Result and Discussion

Children's ability to recognize colours is judged by their ability to display, name, and group. For treatments 1 to 2, the teacher will take pictures with three basic colours: red, yellow and blue. Children are asked to choose several coloured papers, display the colours according to the pictures of coloured objects, name them, and group them. Similar to photos of roses, stars and blue bags, children will be asked to name the colours from the available photos and groups and sort the coloured paper on the photo by colour. The development of children's colour recognition is achieved based on the treatment used at the 1st to 2nd meeting.

<table>
<thead>
<tr>
<th>Table 1. Ability To Recognize Color Treatment 1-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>
The data shown in Table 1 shows that each treatment has a significant effect on the achievement of colour understanding in children. This can be seen from the value of Sig. In Table 1, the value of 0.00 is smaller than the decision value of 0.05. Therefore, the average displayed indicates an increase in the score received by the child for a particular treatment. The use of photos and photographic models provides opportunities for children to explore their ability to understand colour.

Colour recognition can help children stimulate their visual sensitivity. Teachers are tasked with continuing to inspire children to remember what they have seen and learned. One of them trains children's eyesight concentration with objects or colours that stand out using primary and secondary colours. The introduction of colours that are useful for improving children's thinking and creativity can also inspire them to innovate through their activities. It also increases children's sensitivity to the objects they see, allowing them to analyze them separately. Colour recognition is part of cognitive development that needs to be developed at a young age. The right stimulus is needed to achieve its proper development. Early childhood is expected to master the concept of primary and secondary colours in five colour variations.

4 Conclusion

The use of the picture and picture learning model is wrong one option is to introduce colour to early childhood. Children's ability to recognize colours is judged by their ability to designate, mentioning and classify. This research shows that the use of picture and picture models significantly affects colour since early childhood many benefits can be obtained, among other things, children can develop intelligence, not only to hone memory skills, but also to be imaginative and artistic, understanding of space, cognitive skills, and creative thinking patterns. It is hoped that there will be further research to develop this model to be better at optimizing development in early childhood. significant effect on the ability to recognize colours in children. Know colour since early childhood many benefits can be obtained, among other things, children can develop intelligence, not only to hone memory skills, but also to be imaginative and artistic, understanding of space, cognitive skills, and creative thinking patterns.

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Using Interactive Digital Books to Analyze Students' Reading Literacy Skills

Imelda Free Unita Manurung1, Lidia Simanihuruk2, Suyit Ratno3, Frans Nico Hutabarat4

{imeldafreeunitamanurung@gmail.com}

Faculty of Education, Universitas Negeri Medan, Indonesia123, Faculty of Economics and Business, Universitas Trisakti, Indonesia4

Abstract. This study aims to analyze the reading skills of Students by using interactive digital books. The subjects of this study were students at the elementary school teacher education study program in state university of Medan who took the basic concepts of physics and chemistry as many as 40 people. The subjects were taken with cluster random sampling. This study uses a qualitative descriptive method to analyze students' reading skills. The results of the analysis of the use of interactive digital books on the basic concepts of physics and chemistry lectures on students' reading skills showed significant. The development viewed from the aspect of literacy reading skills for the category of students from PISA defining reading literacy as: understanding, using, reflecting on, and engaging with writing.

Keywords: Reading Literacy Skills, Interactive Digital Books

1 Introduction

The ongoing pandemic has led educators to continue to be able to develop and package a learning process to make it more meaningful. The target in development is through a learning product such as a digital book. Seamolec (2013) said: a digital book, also known as an e-book, is a publication consisting of text, images, and sound and published in digital form that can be read on computers or other electronic devices.

According to Tompo (2017:6), electronic publication books have several benefits and advantages, including: 1) As an alternative media in learning, 2) electronic publication books can contain multimedia content in it so that it can present more interesting teaching materials and make lectures more enjoyable, 3) As a medium of information, 4) electronic publication books can be disseminated more easily, either through media such as websites, email, and other digital media, 5) Provide opportunities for content creators to more easily share information in a more interesting and interactive way, 7) Simplify the process of understanding the material, 8) Small physical size, so that it can be stored in data storage (hard drives, CD-ROMs, DVDs) in compact format. Easy to carry, compared to carrying books in very heavy print format 9) Digital format from electronic publication book can last forever with quality that does not change 10) Easy to process where the contents can be tracked, searched easily and quickly. This is very useful for people who do literature studies 11) Can be used by people who don’t read, because the format of the electronic publication book can be processed by a computer, the contents of the electronic publication book can be read by a computer using a text to speech synthesizer 12) Reproduction (duplication, copying) electronic publication book is very easy and cheap 13)
Easy to distribute. Distribution can use electronic media such as the internet. So that through the existence of digital books it is hoped that it can improve the abilities and skills of students.

Based on the results of the preliminary study, it was found that students' interest in reading was low. As quoted in Dalman (2014), reading is an activity or cognitive process that seeks to find various information contained in writing. Reading is essential in obtaining information and knowledge, according to PISA 2015 reading literacy is translated into indicators of understanding, using and reflecting as well as involving written texts to achieve goals and develop the knowledge and potential possessed by individuals. Reading ability (reading for understanding) is a reading activity that aims to understand literary standards or norms, critical reviews, written plays, and fictional patterns (Tarigan, 2015). For this reason, this research is expected to be able to develop students' reading skills, especially students in the elementary school teacher education study program.

2 Research Methods

This type of research uses 4D models (four-D models). According to Trianto (2014) the development of the four-D model consists of 4 main stages, namely 1) define 2) design 3) develop and 4) disseminate.

The procedure for developing Using Interactive Digital Books to Analyze Students' Reading Literacy Skills is as follows:

a. The definition stage, this stage aims to determine the learning achievement of the basic concepts of Physics and Chemistry.

b. Stage Design, this phase aims to design Interactive Digital Books on PGSD students.

c. Development Phase, this stage aims to produce Interactive Digital Books. Development stage (develop) consist of product validation performed by one expert material before the next when the finished product is designed to be validated by media experts.

d. Dissemination stage, this stage aims to distribute Interactive Digital Books to PGSD students to Analyze Students' Reading Literacy Skills.

This study refers to the pretest-posttest control design. The research design to see the improvement of students' creative thinking skills is as follows:

<table>
<thead>
<tr>
<th>Pretest</th>
<th>Treatment</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>O₁</td>
<td>X</td>
<td>O₂</td>
</tr>
</tbody>
</table>

O₁ is the initial test before treatment is given, O₂ is the final test after the treatment is done while x is the treatment of students by using digital interactive book.

3 Result and Discussion

Through an instrument to measure the ability of Science Reading Literacy in this study was developed from PIRLS Literacy which consists of two aspects, namely:

a. Reading Purpose
   - Reading to enhance the experience; and
   - Reading to obtain and use information.

b. Reading Comprehension
   - Live retrieval and inference
• Interpret, integrate, and evaluate.

The lattice of instruments used in the implementation of the interactive digital book to see the ability of reading literacy can be seen in the table below:

### Table 1. Reading Literacy Ability Instruments

<table>
<thead>
<tr>
<th>No</th>
<th>Aspects of Science Reading Literacy Ability</th>
<th>Question Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reading Purpose</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Reading to enhance the experience</td>
<td>4,5</td>
</tr>
<tr>
<td></td>
<td>b. Reading to obtain and use information.</td>
<td>1,2,3,6</td>
</tr>
<tr>
<td>2</td>
<td>Reading Process</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Focus on retrieving information</td>
<td>1, 4</td>
</tr>
<tr>
<td></td>
<td>b. Making conclusions</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>c. Interpret and Integrate ideas and information</td>
<td>2,3</td>
</tr>
<tr>
<td></td>
<td>d. Evaluating information</td>
<td>6</td>
</tr>
</tbody>
</table>

Based on the aspect of the purpose of reading, it was found that 60% of students were able to read to improve experience, while about 40% of students still needed to process how to read in order to be able to improve their experience in a reading book, then about 70% of students were able to read in order to obtain and use information, while around 30% of students need to be more trained to be able to read in order to obtain and use information from a reading material better.

Judging from the results of reading comprehension analysis, in taking and inferring directly a reading, about 70% of students are able to carry out these activities, however 30% of students still need to be trained to be able to more optimally carry out direct retrieval and inference of information. It further discusses interpreting, integrating, and evaluating. In this case, about 60% of students are able to interpret and integrate a reading material, it's just that at the evaluation stage it is necessary to be trained so that the results are maximized. While 40% still need to be improved in understanding a reading material.

From the results of aspects measured based on reading ability using interactive digital books, there are several benefits obtained, however, there are several things that need to be improved. The results of research conducted using the zoom meeting application with a number of participants as many as 40 people obtained the results of instrument trials showing that the value of $t$ count > $t$ table so that it can be concluded that the development of digital books can significantly improve students' scientific reading literacy skills, therefore digital products book is worthy of being used in the learning process.

Based on the results of the implementation of learning that has been carried out using digital books, it can be seen in the following table:

### Table 2. The Implementation of Learning Process

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Giving a Simple Explanation</td>
<td>75%</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Building Skills Base</td>
<td>75%</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>Conclusion</td>
<td>80%</td>
<td>Good</td>
</tr>
</tbody>
</table>
Furthermore

80% Good

5 Strategy and Technique

75% Good

From the results obtained above, the percentage of 77% is in the good category, which means that the implementation of learning using digital books can take place well.

4 Conclusion

Based on the results of the research conducted, it was concluded that the development of digital books can significantly improve students' scientific reading literacy skills, therefore digital book products are feasible to use in the learning process and from the results obtained the percentage of implementation of learning using digital books.

Acknowledgment

From the research that has been done, the researcher would like to thank all those who have helped so that this research process can be carried out properly. Hopefully this research can be useful for many people.

References

Need Analysis of Augmented Reality Based Virtual Laboratory for Chemistry Practicum Purposes

Muhammad Nazar¹, Kana Puspita², Mukhlis Hidayat³, Muttakin⁴
{mnazar@unsyiah.ac.id}

Department of Chemistry Education, Universitas Syiah Kuala, Kopelma Darussalam¹; Department of Mathematic Education, Universitas Syiah Kuala, Kopelma Darussalam²; Chemistry Department, Universitas Serambi Mekkah, Banda Aceh³

Abstract. To keep following the Covid-19 protocol, students are not recommended to take courses on campus. As a result, they are not able to do essential lab work as usual. In this paper, we address the early stage of the developing process of an Augmented Reality run on Android devices to help students understand the theoretical framework of atoms. The need analysis was conducted to acquire the teachers' and students' thoughts toward the development of the AR. The questionnaire was developed based on the Likert scale. 113 respondents including students and teachers volunteered and filled the online questionnaire. The results show that most respondents agree that the AR application is needed for online practicum and they are willing to support and use the application. Android platform is preferred over other platforms, and the concept of atom and molecule was chosen by the vast majority of respondents. Therefore, the AR application about atom will be developed on the Android platform.

Keywords: Augmented Reality, Virtual Laboratory, Chemistry Lab

1 Introduction

The demand for digital resources in the current learning environment is increasing more significantly due to the online learning process conducted by almost all education institutions all over the world [1]. The students either at the university or at high schools are not suggested to attend the class in order to avoid Covid-19 infection. As a result, schools or universities have to provide online learning systems that support the learning process at any cost. The online learning or distance learning required not only internet access [2] but also adequate learning resources [3] to ensure that students are capable of mastering certain coursework in their field of study.

Practical work in chemistry is important not only because the practical work is utilized to prove the theoretical knowledge of Chemistry, but it is also essential for students to increase their hard skills. However, since the Covid-19 attack, online learning systems have been widely introduced all over the world. In order to support the online learning environment, Augmented Reality (AR) technology has become a very promising platform for students to be used as a learning tool. The AR technology has been extensively used in the field of medical [4], geography [5], robotics [6], drug development [7], medical operations [8], and architecture [9]. Furthermore, the AR has also been widely used and implemented in education as reported by many researchers and educators [10]–[14]. In the field of chemistry education, the AR
technology has been intensively developed for particular concept like molecular geometry [15], molecular interface [16], and general chemistry course [13], [17]. In this paper, we report the on going development of AR application for several concept in chemistry especially the concept that can be used in practical work in the virtual laboratory.

2 Research Methods

The AR app is being developed through the Research and Development (R&D) which adopts the ADDIE model. The first stage of the development process is need analysis which will be further described in this article. 113 respondents including teachers and students took part in the survey, and the demograpy is depicted in Table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Criteria</th>
<th>Sub-criteria</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sex</td>
<td>Female</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>18</td>
</tr>
<tr>
<td>2</td>
<td>Profession</td>
<td>Student</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teacher</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Age range (Year)</td>
<td>15-25</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26-36</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37-47</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>48-58</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ERROR</td>
<td>9</td>
</tr>
</tbody>
</table>

The online questionnaire consisted of 13 items (11 items in the Likert form, and 2 items in a regular multiple choice) were created by using a Google form and delivered to the respondents through a Whatsapp group. The questionnaire results were then collected after 3 weeks and was then analysed.

3 Result and Discussion

Virtual applications are now in a great need due to online learning popularity not only in developed countries like UK, Germany and the US, but also in developing countries such as Indonesia. The survey results indicate that most educators and students have never used AR applications in learning even though the majority of them know about AR as depicted in Table 2.
<table>
<thead>
<tr>
<th>No</th>
<th>Response Questions</th>
<th>SA</th>
<th>A</th>
<th>NAD</th>
<th>DA</th>
<th>SDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In my opinion, practicum is important in studying chemistry</td>
<td>107</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Practicum helps students in understanding chemical concepts</td>
<td>108</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Virtual Chemistry Practicum (Online) is needed during the Covid-19 Pandemic</td>
<td>88</td>
<td>22</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Learning resources for online practicum are still limited</td>
<td>55</td>
<td>41</td>
<td>14</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>A special application for online practicum is very much needed</td>
<td>98</td>
<td>12</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>I know about Augmented Reality (AR)</td>
<td>22</td>
<td>30</td>
<td>25</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>7</td>
<td>In my opinion, AR applications are very good for practical use</td>
<td>71</td>
<td>36</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>I believe that AR applications can help students in doing chemistry practicum</td>
<td>81</td>
<td>28</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I support if anyone develops AR-based Virtual Lab applications</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>24</td>
<td>37</td>
</tr>
<tr>
<td>10</td>
<td>I have used the AR app</td>
<td>98</td>
<td>14</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>I am willing to try the AR application</td>
<td>113</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SA=Strongly Agree, A=Agree, NAD=Neither Agree or Disagree, DA=Disagree, and SDA=Strongly Disagree

When asked about their opinion about how important is the practical work in learning chemistry and the role of practical work in comprehending chemistry, most of them strongly agree that the practical work is essential for students in mastering chemistry concepts. In current situation where physical attendance of students in the class room for practical work is not recommended, a virtual simulation become very important for learning. When asked about whether online resources for chemistry practicum adequate or not, most respondents agree that it is available but limited in number.

Based on literature exploration, most of the online or virtual resources for practical work is dominantly available in English. Because English is a foreign language in Indonesia, it is quite difficult for students to follow the steps provided by developer of the virtual simulating program of a practicum. Therefore, virtual resource for practicum especially in chemistry concept is essential to be developed.

Furthermore, because an AR app usually requires many big file of 3D, it is necessary to break out the particular concept to be developed. In this work therefore, after deep analysis, we selected some particular concepts to be included in the app as depicted in Figure 1.
When asked about what concepts should be included in the AR app, majority of the respondents suggested the concepts of atom and molecule, chemical reactions, and metal substances flame test more dominantly compared to colloids and redox reactions. The concept of atom and molecule is an interesting concept in chemistry that could promote students learning motivation increase. Therefore, in this work the concept of atom and molecule will be further included in the AR app.

![Bar chart showing the concepts chosen by respondents.](image)

**Fig.1.** The concepts chosen by respondents to be included in the content of the AR

Fig.2 depicts the platform's preferences where the AR application should be developed according to respondents. Android OS and Windows are the two platforms that are dominantly chosen by most respondents. However, 39% of respondents prefered Android for its practicality over Windows (27%). Android dominates the global smartphone operating system market share and more than 72% of the world's population uses Android devices based on the data of last year.

![Pie chart showing platform preferences.](image)

**Fig.2.** Different platforms of development suggested by respondents

Fig.2 depicts the platform's preferences where the AR application should be developed according to respondents. Android OS and Windows are the two platforms that are dominantly chosen by most respondents. However, 39% of respondents prefered Android for its practicality over Windows (27%). Android dominates the global smartphone operating system market share and more than 72% of the world's population uses Android devices based on the data of last year.

### 4 Conclusions

To conclude, because most respondents show their interests in the development and the results of AR and based on their response regarding both preffered concepts and platforms, the
AR based virtual lab will be developed on Android platform for several concepts of Chemistry including Atom, Chemical Reactions, and metal substances flame test.

Acknowledgments
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References
The Effect of Content Mastery Services Using Sociodrama Techniques on Social Ethics of Class VIII Students at Karya Bunda Private Junior High School for The Academic Year 2021/2022

Zuraida Lubis¹, Tika Wahyuni²
{zur.loebis@gmail.com}

Guidance and Counseling, Universitas Negeri Medan

Abstract. This study aims to determine the effect of content mastery services with sociodrama techniques on social ethics in class VIII. This research is a quasi-experimental or quasi-experimental research with one group pre-test post-test design. The approach used is a quantitative approach. The subjects of this study were 14 students of class VIII who had a low score on social ethics. The data collection technique in this study used a social ethics questionnaire. The results of this study indicate that the level of students' social ethics has increased after being given content mastery services with sociodrama techniques. This is shown from the Wilcoxon test results that $J_{\text{count}} > J_{\text{table}}$ where 36 > 21, meaning that the hypothesis is accepted. It can be concluded that content mastery services with sociodrama techniques have a positive and significant influence on the social ethics of class VIII students at SMP Swasta Karya Bunda.

Keywords: Content Mastery, Sociodrama, Social Ethics

1 Introduction

Humans are creatures that cannot live alone. Humans need other humans to survive in their environment, that's why humans are called social creatures. Gerungan (in Kurniawan, 2016, p. 1) states that humans are essentially social creatures who need social with other people to fulfill their needs. This shows that the social in life between individuals influence each other and form social interactions. In survival, humans must understand and understand how to get along with the surrounding environment. In society, there are many things we need to know. Because humans live side by side and interact with each other, they must have rules that can separate the rights and obligations of each person. Ali and Asrori (2004, p. 93) explain that the process of individual socialization occurs in three main environments, namely the family environment, school environment, and community environment.

Basically, the school years are adolescence where this period is very important in human life because it is a period of transition from childhood to adulthood. Moral formation in the process of life in the family, at school and in society has begun in adolescence. The cognitive abilities of adolescents are increasing their awareness of morals. Soeparwoto (2004, p. 103) states that the achievement of the level of development both physically and psychologically makes many adolescents experience changes in their attitudes and behavior. Individuals who have entered...
adolescence are expected to replace these concepts. Moral principles that apply in childhood with generally accepted moral principles that serve as guidelines for behavior in life. In adolescence, individuals must begin to be responsible for controlling their own behavior which was previously the responsibility of parents and teachers as a child so that their behavior does not violate the morals that apply in life with other people and the surrounding environment.

During this period of adolescence, there is usually a quite striking change in attitude and is placed as one of the characteristics of adolescents, namely opposing the basic values of life of parents and other adults. The social situation greatly determines the moral development of students, seen from who and with whom they hang out, what kind of environment, and what happens in the social. They do not have to be limited in socializing so that they get to know the environment more broadly, because at this time adolescents have developmental tasks that they must complete so that they feel happy with what they have achieved during that period.

Good social is realized if in the social there is ethics as a controller. In group life, ethics also act as a guide for good-bad behavior in the social between human beings. Ethics (ethics) concerns the way of action that must be carried out by a certain person or group which means moral, namely providing norms about actions. Keraf (in Sagala, 2013, p. 7) states that ethics gives us guidance or orientation in living our lives in this world. This means that human actions always have certain goals that they want to achieve by fulfilling ethics. Judging from all aspects of human life, human actions can be categorized into two, namely, first actions born with the will and intentional by the perpetrator, second actions born without the will and unintentional.

Human behavior or actions appear in daily interactions, while the purpose of social is nothing but maintaining the interests of each involved in interacting. The social is carried out so that they are happy, calm, peaceful, protected without harming their interests, and guaranteed that their actions are being carried out according to prevailing customs and do not conflict with human rights in general as the basis for the growth and development of ethics in society. During adolescence, significant social changes are seen, social ethics are indispensable for the realization of a healthy and orderly life. According to Gunarsa, adolescence is also a period of extensive learning, covering the fields of intelligence, social, and others related to his personality (in Nurul Anisah, 2016, p. 2).

Strike and Soltis (2016, p. 69) argue that social ethics is a relationship of individual behavior in which there are norms and values used in everyday life and is a benchmark for individual behavior that is used by society to determine whether it is good or bad. Human action in everyday life. Rifai et al. stated that ethics in social can be interpreted as customs about behavior that are mutually agreed upon as something good in friendship (Sunarti and Restati, 2020, p. 63).

The problem of social ethics is a problem that generally occurs in students, wherever students are, ethics must play a role in controlling good-bad behavior in relationships. Students in their social need behavioral guidelines so that peer-to-peer interactions can run well in accordance with community norms and religious norms they adhere to, so that they avoid deviant socials, avoid various problems and avoid conflicts. Social ethics has a very strategic role in improving the quality of self in group life in the midst of a community, school and family environment that has its own values and norms.

Abdullah (2006, p. 646) argues that a person must create polite and courteous relationships, respect the rights of fellow human beings, and should not feel better than others. Ethics in social is something that must be understood by all students when they are in the school environment or in the community as a guide in moral reflection. If the student does not know and understand the situation that occurs around him, then the student may commit violation of the rules when dealing with other students in the school environment. Therefore,
it is necessary to instill an understanding of social ethics in students so that they are able to apply it in everyday life.

Students in high school should have characters in accordance with the values and norms that apply in society, namely being able to be polite and have ethics in their daily lives but along with the development of the times, it is found in schools that the social ethics of students is still relatively low, for example, showing an attitude who is not polite to friends, his words offend others, calling friends with rude names, lack of tolerance, and so on. There are several factors that cause students to have a low understanding of social ethics including internal factors that come from themselves and external factors that come from the surrounding environment.

At this time students are required to be responsible for controlling their behavior, especially when socializing because in this situation the social plays an important role in the formation of morals in students. In order to develop good social ethics, the way that students can do it is by being polite, respecting each other, so in this case students must be able to communicate well without offending other people's feelings. Students who can be categorized as having a low understanding of social ethics are students who tend to have impolite behavior, their words can offend others, lack respect for others, and have difficulty controlling emotions.

Based on the results of observations made by researchers with BK teachers in March 2021 at Karya Bunda Private Junior High School, it appears that some Class VIII students have a low level of social ethics. This is indicated by the behavior of students who are impolite when the teacher is explaining, interrupting a friend's conversation while talking, not respecting a friend's opinion, calling friends with bad words and being less polite when talking to other people. Such student behavior tends to show low social ethics.

Based on some of the symptoms mentioned above, there are many ways that can be done to overcome the problems of social ethics experienced by students, one of which is the service of mastering sociodrama technique content. Sociodrama technique is a role-playing learning method to solve problems related to social phenomena, problems involving human relationships (Purnamasari, 2012, p. 74). This content mastery service needs to add insight and understanding, direct judgment, attitudes, and behavior, master certain ways or habits to meet their needs and overcome problems.

The provision of content mastery services can be carried out in classical form, groups using lecture and discussion methods as well as by demonstration or giving examples (Kusumaningrum et al., 2014, p. 2). According to Wingkel (in Kusumaningrum et al., 2014, p. 3) sociodrama technique is a dramatization of the problems that can arise in social with other people, the level of conflict experienced in social interaction. The dramatization of the players in projecting the attitudes, feelings, and behavior of people is played by playing a role in a drama, the role holder will demonstrate his role so that he understands how the behavior is being demonstrated. According to Djumhur and Muh Surya, sociodrama is used as a technique to solve social problems through play activities (Kusumaningrum et al., 2001, p. 3).

So in this sociodrama, the person will play a special role in the situation of a social problem so that he can feel the role he plays directly, it can be assumed that the problem of social ethics can be overcome through the service of mastering the content of sociodrama techniques. In relation to efforts to overcome student social ethics, there is one research conducted by Rismananda Yulizar (2018) which examines improving ethical behavior through sociodrama technique group guidance services, the results of the study show that sociodrama techniques are effectively used in overcoming ethical problems in students.

The level of ethical behavior in these students shows a change after the service has been carried out. Therefore, through content mastery services with sociodrama techniques, it is
expected to improve students' social ethics problems for the better way. According to Pitaloka (2017, p. 10) social ethics is a set of polite norms that become a guide for one's behavior with others. Social ethics will provide orientation to a person to live life through a series of daily actions.

According to Novita (2015, p. 20) social ethics is a relationship of individual behavior in which there are norms and values used in everyday life and is a benchmark for individual behavior that is used by society to determine the good or bad of an action. Social ethics is something that reflects the morals of everyone that must be known and understood by everyone in the social and educational environment so that they apply it and understand it in their lives (Sinen, 2014, p. 3).

According to Karyani, social ethics are good manners that are respected by everyone and what may be understood in the family environment is not well accepted elsewhere, so each individual must understand social ethics (in Dewi, 2018, p. 1). According to Prayitno (2015, p. 29) explains that content mastery services are assistance services to individuals (alone or groups) to master certain abilities or competencies through learning activities.

Meanwhile, according to Sukardi (2008, p. 62) content mastery services or learning services, namely, guidance and counseling services that allow students to develop themselves with regard to good study attitudes and habits, suitable learning materials, and various other aspects of knowledge. The content that is the content of this service is a unit of material that is the subject of discussion or training material developed by a supervisor or counselor and followed by a number of students.

The technique used in this research is sociodrama technique. According to Romlah and Tatiek (2001, p. 104) sociodrama is a role play aimed at solving problems that arise in human relationships. Through active student involvement in the role-playing process, students can develop new understandings and practice new skills. According to Yamin (in Sari, 2016, p. 30) states that the sociodrama technique or role playing is a method that involves interaction between two or more students about a topic or situation. With the service of mastering the content of sociodrama techniques, it is hoped that there will be changes in the level of social ethics in students.

2 Research Methods

This type of research is a quasi-experimental (quasi-experimental), namely research that provides treatment or action to a group of people or research subjects with a quantitative approach. To determine the effect of content mastery services with sociodrama techniques on students' social ethics by using pre-test and post-test methods.

The pre-test and post-test design patterns are as follows:

<table>
<thead>
<tr>
<th>O₁</th>
<th>O₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>X:</td>
<td></td>
</tr>
<tr>
<td>Treatment (Sociodrama Technique Content Mastery Service)</td>
<td></td>
</tr>
</tbody>
</table>

O₁: Pre-test is given before treatment
X: Treatment (Sociodrama Technique Content Mastery Service)
O₂: Post-test administered after treatment

Research subjects are everything that has the nature or characteristics and circumstances under study. The target of this research is class VIII students at Karya Bunda Private Junior High School who have low social ethics. From the total number of students, the research subjects
who met the requirements were determined, namely 14 people who had a low level of social ethics. In determining the students who became the research subjects, it was determined by purposive sampling technique with the characteristics of the results of the pre-test questionnaire analysis that obtained a low score. In this study there are two variables, namely the independent variable and the dependent variable: a) Independent variable: Content Mastery Service With Sociodrama Techniques; b) Dependent variable: Social Ethics.

The tool used to collect data in this study is to use a questionnaire. Questionnaire is a list that contains a number of questions given to the subject in order to reveal the conditions they want to know. The number of items is 49 questions or statements. The questionnaire made has 4 alternative answers in the form of a Likert scale, namely Always (SL), Often (SR), Sometimes (KD), Never (TP). The Likert scale has positive items (supports the statement) and negative items (does not support the statement). For positive items are given a value range of 4-1, while for negative items are given a value range of 1-4. For more details can be seen in the table below:

<table>
<thead>
<tr>
<th>Alternative Answer</th>
<th>Item Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive (+)</td>
</tr>
<tr>
<td>Always</td>
<td>4</td>
</tr>
<tr>
<td>Often</td>
<td>3</td>
</tr>
<tr>
<td>Sometimes</td>
<td>2</td>
</tr>
<tr>
<td>Never</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Sugiyono (2012, p. 153)

Data analysis technique is an activity after data from all respondents or other data sources are collected (Sugiyono, 2012, p. 207). The objectives to be achieved in this study are to find out the description of students' social ethics before and after being given content mastery services with sociodrama techniques and to find out whether there are differences in students' social ethics before and after being given content mastery services using sociodrama techniques. Then the data analysis technique used is the Wilcoxon test. This test has more test power than the sign test.

In the Wilcoxon test, it is not only the sign that is considered but also the value of the difference (X:Y). The method is as follows: a) Number each absolute value of the difference (X - Y). The smallest absolute price is given a serial number rank 1, the next absolute price difference is given a serial number 2, and finally the largest serial number is given a serial number n. if there is a difference whose absolute value is the same, for the serial number the average is taken; b) For each serial number also give a sign obtained from the difference (X - Y); c) Count the number of serial numbers that are positive and also the number of serial numbers that are negative; d) For the serial number obtained at point c, take the smallest absolute value, call this number equal to J. This number of J is used to test the hypothesis.

The test the hypothesis above with a significance level of = 0.05. Compare J above with J obtained from Wilcoxon test table list. If J from the calculation is less than or equal to J from the Wilcoxon test table list, then H 0 is rejected and vice versa, if J from the calculation is greater than J the Wilcoxon test table list then H 0 is accepted. The location of this research was carried out at the Karya Bunda Private Junior High School which is located on Jl. Main.
3 Result and Discussion

Based on the results of this study, that the research hypothesis is accepted, it means that there is a positive and significant effect of content mastery services with sociodrama techniques on social ethics in class VIII Junior High School Swasta Karya Bunda for the year 2020/2021. It is shown from the results of data analysis obtained in this study that obtained value of \[ J_{count} = 36 \] with \[ \alpha = 0.05 \] and \[ N = 14 \] then the value of \[ J_{table} = 21 \] is obtained. Hypothesis is accepted.

Pre-test data on social ethics or before being given content mastery services with sociodrama techniques obtained an average score of 99 while post-test data on social ethics or after being given content mastery services with sociodrama techniques obtained an average score of 164. This means that there is a change in the level of students' social ethics with a score difference of 65 or 39.6%. This shows that there is an influence of content mastery services with sociodrama techniques on social ethics in class VIII students of Karya Bunda Private Junior School for the 2020/2021 Academic Year or the hypothesis is acceptable. With the influence of content mastery services with sociodrama techniques on students' social ethics, content mastery services are one of the services in guidance and counseling that can have a positive influence on social ethics. Based on the results of the Pre-Test and Post-Test of 14 class students, the following data were obtained.

<table>
<thead>
<tr>
<th>No.</th>
<th>Respondent</th>
<th>Score Pretest</th>
<th>Score Post-test</th>
<th>Different (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KC</td>
<td>90</td>
<td>146</td>
<td>56</td>
</tr>
<tr>
<td>2</td>
<td>L</td>
<td>92</td>
<td>150</td>
<td>58</td>
</tr>
<tr>
<td>3</td>
<td>ZP</td>
<td>93</td>
<td>160</td>
<td>67</td>
</tr>
<tr>
<td>4</td>
<td>AP</td>
<td>95</td>
<td>157</td>
<td>62</td>
</tr>
<tr>
<td>5</td>
<td>AZ</td>
<td>96</td>
<td>182</td>
<td>86</td>
</tr>
<tr>
<td>6</td>
<td>FF</td>
<td>97</td>
<td>166</td>
<td>69</td>
</tr>
<tr>
<td>7</td>
<td>UD</td>
<td>97</td>
<td>165</td>
<td>68</td>
</tr>
<tr>
<td>8</td>
<td>AM</td>
<td>98</td>
<td>160</td>
<td>62</td>
</tr>
<tr>
<td>9</td>
<td>AB</td>
<td>98</td>
<td>162</td>
<td>64</td>
</tr>
<tr>
<td>10</td>
<td>GW</td>
<td>102</td>
<td>159</td>
<td>57</td>
</tr>
<tr>
<td>11</td>
<td>R</td>
<td>104</td>
<td>176</td>
<td>72</td>
</tr>
<tr>
<td>12</td>
<td>HV</td>
<td>107</td>
<td>180</td>
<td>73</td>
</tr>
<tr>
<td>13</td>
<td>DN</td>
<td>110</td>
<td>173</td>
<td>63</td>
</tr>
<tr>
<td>14</td>
<td>DW</td>
<td>112</td>
<td>163</td>
<td>51</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1391</td>
<td>2299</td>
<td>908</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>99</td>
<td>164</td>
<td>65</td>
</tr>
<tr>
<td>Lowest Value</td>
<td></td>
<td>90</td>
<td>146</td>
<td>51</td>
</tr>
</tbody>
</table>
Based on the overall analysis of 14 respondents there was an increase in students' social ethics, from these results it can be seen that in the initial test (pre-test) an average score of 99 was obtained, and after the provision of content mastery services with sociodrama techniques (post-test) the average was obtained. The average of 164 students is 65 or 39.6%, meaning that the average score of students' social ethics is lower before getting content mastery services with sociodrama techniques, and after being given content mastery services with sociodrama techniques, the average score obtained by students be higher.

4 Conclusion

The results of the analysis of the data obtained in this study are the value of $J_{count} = 36$ with $= 0.05$ and $N = 14$ then the value of $J_{table} = 21$ is obtained. The pre-test data on students' social ethics or before being given content mastery services with sociodrama techniques obtained an average score of 99 while the post-test data on students' social ethics or after being given content mastery services with sociodrama techniques obtained an average score of 164. This means that there is a change in level students' social ethics with a score difference of 65 or 39.6%. This shows that there is a positive and significant effect of content mastery services with sociodrama techniques on the social ethics of class VIII students at Karya Bunda Private Junior High School for the Academic Year 2021/2022 or the hypothesis can be accepted.

With the influence of content mastery services with sociodrama techniques on students' social ethics, content mastery services are one of the services in guidance and counseling that can have a positive influence on social ethics.

References


Arrangement of Life Skills Module for Improving Critical Thinking Ability and Creativity in Guidance and Counseling Students of Medan State University

Erwita Ika Violina¹, Nani Barorah Nasution², Rahmuliyan³, Nur Arjani⁴
{erwitaika@unimed.ac.id}
Faculty of Education, Universitas Negeri Medan¹²³⁴

Abstract. Development of life skills is how an individual activated and mobilize all positive values and competencies possessed to the maximum to be implemented in maintaining his daily life. This research is Research and Development (R&D) which aims to develop learning innovations that can be used by counselors to develop their existing skills, including attitude, creativity, and interaction. The development models are 4-D models (Define), (Design), (Develop) and (Desseminate). Score of trials on 100 students is 94.17 in “very good” category, this module was very easy to understand, very clear, very interesting, very appropriate, easy to understand, and very useful for improving student’s life skills.

Keywords: Modul, Life Skills Development.

1 Introduction

Learning is a process that occurs in humans by thinking, feeling, and moving to understand every reality they want to produce a behavior, knowledge, technology or a new skill that they have to be able and survive to do something well. The current state of educational development, especially in our country, demands that all parties, both educators and stakeholders, make changes in their teaching approach that feels conventional and purely doctrinal. This is still a lot in areas that seem to position students as objects of education. This also happens at the university level. In fact, students are actually creatures that are completely different from animals. There is a lot of potential that God has given to humans, which in this case students just ignore. The position of lecturers when transferring knowledge to students, sometimes they still forget that their position as the subject of education is neglected. This is because they demand that existing students have to master the theories as they have, often without any real application to develop life skills in real life. So that students are impressed like a bank that only use for knowledge storage.

Hurlock (1980) identified the developmental tasks of adolescents, namely: (1) Achieving new and more mature relationships with peers, both male and female, (2) Achieving male and female social roles, (3) accepting one's physical state and using it effectively, effective, and (4) Achieve emotional independence. In an effort to achieve the social roles of men and women which includes career achievement efforts. Adolescents in the category of a student must prepare for a successful adult life to increase their abilities and life skill competencies without experiencing barriers to communication and students can also deal with stressful situations.
effectively (Kumar, 2014). According to Chhadva (2013) life skills are defined as psychosocial abilities for adaptive and positive behavior that enable individuals to face the challenges of everyday life. Skills are grouped into three skill categories: Cognitive skills used to analyze information, personal skills to develop personality and manage oneself, and interpersonal skills to communicate and interact effectively with others.

Students are individuals who have high intellect, intelligence in thinking and have a plan in every action (Siswoyo, 2007). In line with that, Takwin (2008) also mentions that students are independent individuals and have good life plans in terms of careers and relationships with the opposite sex. In addition, the lecture period is the right time to learn new things such as language and social roles and is a vital time to shape their life skills (Mofrad, 2013).

Some of the difficulties that will be experienced by students because they do not have life skills include being unable to make the right decisions, being excluded from the social environment, and so on (WHO, 1997; Mofrad, 2013). Therefore, students also need to be equipped with the basis for healthy mental development, so that adolescents are able to go through the transition period and can reach adulthood without problems. Life skills are skills or abilities to be able to adapt and behave positively, which allows a person to be able to deal effectively with various demands and challenges in daily life (Anwar, 2012).

As is understood together, that in the current context, education as referred to above (education is like a bank), if examined with a broader and deeper perspective, completely overrides human aspects and makes students stunted and uncreative. This is because the class is only controlled by the lecturer. For this reason, it is necessary to develop a system that is applied by developing life skills, namely an education system where life skills are something that needs to be developed in every life.

So that in time they become part of the community who are able to think and act maturely, critically, have character in responding to life, can make a positive contribution and survive in the midst of life in their time. In principle, the development of life skills is how a person can activate and mobilize all positive values and competencies possessed to the maximum to be implemented in maintaining daily life. Therefore, in this article the author wants to describe about education and skills guidance life skills for students, which all of us have tended to ignore.

**Life Skill**

Life skills are defined as skills that are learned to do something well. Life skills are the habits of every individual by learning something that can help improve the quality of life. Life skills can be interpreted as "skills that help an individual be successful in living a productive and satisfying life". The meaning of life skills is a habit for positive and adaptive behavior that allows each individual to relate effectively to the demands (needs) and challenges in everyday life. The Ministry of National Education (2003) states that life skills are skills possessed by a person to be willing and brave to face life's problems and life naturally, without feeling pressured, then proactively and creatively seek and find solutions so that they are able to overcome them.

Life skills must be possessed and well understood by everyone to behave positively and adaptively, which enables individuals to deal effectively with everyday needs and challenges. The main life skills include problem solving, decision making, creative and critical thinking, effective communication, interpersonal skills, empathy, and self-awareness, coping with stress and emotions. Life skills are grouped into thinking skills, social skills and emotional skills (Dhingra, R., & Chauhan, K, 2017).

The module is one form of teaching material that is packaged in a complete and systematic way which includes a set of learning experiences as an independent learning tool so that students can learn independently. (Daryanto, 2013). This opinion is in line with the Ministry of National
Education (2008: 20) which explains that the module is a set of teaching materials that are presented systematically so that students can learn with or without a teacher. Furthermore, Purwanto (2007: 9) suggests that the module is a learning material that is systematically designed based on a certain curriculum and packaged in the form of the smallest learning unit and allows it to be studied independently in a certain time unit.

Based on the explanation above, it shows that the module is one of the media that can be used in the learning process which is packaged in the form of the smallest learning unit and allows it to be studied independently by the counselor. The development of the life skills module allows students majoring in BK, Faculty of Education, to learn and practice independently, to develop themselves in creating directed counseling relationships and improve skills when providing counseling services later. Experts point out that there are a number of skills that are basic skills and play an important role in improving the health and well-being of children and adolescents. These skills include decision making, problem solving, critical thinking, creative thinking, effective communication, fostering interpersonal relationships, self-awareness, empathy, coping with emotions and coping with stress (Anwar, 2012).

As is also stated in the National Education Law no. 20/2003 article 26 paragraph 3 that Life Skills Education (LSE) is classified as non-formal education, which provides personal, social, intellectual and vocational skills to be able to live and work independently. Starting from the development of life skills, it can be obtained through the learning process in a university environment by providing various opportunities to discover, explore, analyze, and evaluate various experiences, so that it can grow one's new thoughts and knowledge and benefit oneself, the organization, and society. And society as well as making students able to think critically, have creativity in problem solving, and be innovative as a manifestation of the development of life skills that exist in themselves. And it can be explained in Figure 1 below.

The World Health Organization (1999) suggested life-skills education as a way to promote emotional and social development and thus to prevent health and social problems. They proposed nine core life skills: (1) problem solving, (2) stress management, (3) assertiveness, (4) social adjustment, (5) pressure resistance, (6) decision making, (7) critical thinking, (8) interpersonal skills, and (9) effective communication. The United Nations defines life skills as a large group of psychosocial and interpersonal skills that can help people make informed decisions communicate effectively, and develop coping and self-management skills, which can lead to a healthy and productive life (United National Children’s Fund, 2012).
2 Research Methods

This research was conducted at the Guidance and Counseling Department - Unimed Faculty of Education for second semester students of the 2019/2020 Academic Year. This research is a descriptive research with a quantitative approach to see how the influence of the development of the life skills module on the formation of skills in students in the Guidance and Counseling department – Faculty of Education, State University of Medan. This study uses a 4D model (four-D models). According to Trianto (2014: 184) the development of the four-D model consists of 4 main stages, namely: 1) define (determine the material), 2) design (design), 3) develop (development), and 4) disseminate (dissemination).

This questionnaire was given to students to measure the effectiveness of the module in the form of an assessment questionnaire aimed at a limited field trial group of 20 students and an operational field trial with a total of 100 students. However, in this research, only 3 stages were carried out, namely defining, designing, and developing. The dissemination stage was not carried out due to cost and time constraints. The population in this study were all students of the Guidance and Counseling Department of Stambuk 2020 as many as 100 people. The research design used in this study can be seen in Figure 2 below:

The data collection in this study used a questionnaire that will be filled out by the 2020 Stambuk guidance and counseling students. The type of questionnaire used in this study was a closed questionnaire type, that is, the answer to the questionnaire has been provided so that respondents just choose. Questionnaire research in this study is to use a Likert scale with favorable statements which are statements that support or favor the object of research, and unfavorable statements that do not support or favor the object of research. The questionnaire that will be distributed first is tested for validity and reliability.

3 Results and Discussion

The development of the life skills module is made to help students develop the ability to identify problems or life skills in guidance and counseling. The results obtained in this module require competence in attitudes, creativity, interaction with oneself, others and the environment as well as the ability to overcome problems and pressures between peers, emotional conflicts and stress, all of which students can possess and are able to become independent counselees in good decision making for himself in the guidance and counseling services.

Researchers are interested in discussing the development of life skills modules for second semester students of BK FIP UNIMED. This module was created based on Nasution's opinion saying that "a module can be formulated as a complete unit that stands alone and consists of a series of learning activities that are structured to help students achieve a number of goals that are formulated specifically and clearly". The specific and clear goal is material about life skills. As the chairperson and team members in the preparation of Life Skills modules, BK majoring students feel responsible for preparing standard Life Skills modules for the Guidance and Counseling Study Program. The module preparation team is determined to make modules that are in accordance with field needs so that learning outcomes are achieved and graduates have good performance in providing counseling services.
Assessment and evaluation on the development of life skills modules (life skills) according to media experts and material experts is carried out after the process of filling out the questionnaire and consulting the expert test. Meanwhile, the assessment and evaluation to the main field as well as operational field trials were carried out after the questionnaire was filled out. The following is presented in table 1 below.

**Table 1. Feasibility Result Questionnaire for Life Skills Module Development**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Hasil evaluasi ahli media</th>
<th>Hasil evaluasi ahli materi</th>
<th>Hasil uji coba lapangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>90</td>
<td>2514</td>
<td></td>
</tr>
<tr>
<td>Score</td>
<td>87.5</td>
<td>90</td>
<td>78.56</td>
</tr>
<tr>
<td>Description</td>
<td>SB</td>
<td>SB</td>
<td>B</td>
</tr>
</tbody>
</table>

From the data in Table 1, above, it can be concluded that the evaluation results from media experts obtained a total of 70 with a value of 87.5 and was in the very good category, then on the assessment of material experts the number of 90 with a value of 90 was in the very good category, and Finally, on the results of the field trial, the total was 2514 with a value of 78.56% and was in the good category.

So it can be concluded based on the results of the evaluation of media tests, material tests and test results in a description that is acceptable, with the category that the development of the life skills module can be understood, the language is very clear, interesting, very appropriate, and useful and can be accepted as reference material in the process. learning specifically in the Guidance and Counseling department as a forum for the development and formation of life skills, especially during the counseling service process in schools. Media expert assessment data on the quality of the developed media products.

Media experts provide an assessment of various matters concerning aspects of media quality specifically and in depth. Very good category includes: Very easy to understand, very clear, very interesting, very appropriate, and very useful given a score 4. Good category includes: Easy to understand, clear, interesting, appropriate, and useful given a score 3. Poor category includes less easy understood, less clear, less interesting, less appropriate, and less useful were given a score of 2. The bad category includes: Not easy to understand, unclear, uninteresting, inappropriate, and not useful given a value of 1.

**Fig 1. Chart of evaluation results**

The explanation of Figure 1 above is a description of the results of the development of the life skills module after evaluation from media experts, material experts and the results of field trials. The result is that the development of the life skills module is worthy of being used as a
medium that can be used for BK Lecturers in providing information about the development of life skills. From the foregoing, it can be concluded that the process of developing the life skills module from this research started from the preparation of the outline of the module content, module design, trial review and revision through experts (material experts, service experts, and media experts), trial small groups, large group trials, and finalization and printing.

4 Conclusion
The conclusions in the research are as follows:

a. This module is one of the media that can be used in the learning process regarding an integrative and comprehensive study or analysis using various techniques.
b. Life skills are skills and abilities possessed by a person to be willing and brave to face the problems of life and life naturally without feeling pressured.
c. Based on the results of the assessment data of media experts on the quality of the developed media products. Media experts provide an assessment of various matters concerning aspects of media quality specifically and in depth, it is known that the total score of 70 with a score of 87.5 is in the very good category.
d. Based on the results of the material expert assessment data on the quality of the material developed. Material experts provide an assessment of various matters concerning aspects of the use of sentences specifically and in depth, it is known that the number is 90 with a value of 90 being in the very good category.
e. The results obtained in this module require competence in attitudes, creativity, interaction with oneself, others and the environment as well as the ability to overcome problems and pressures between peers, emotional conflicts and stress, all of which students can possess and are able to become independent. counselees in making good decisions for themselves in guidance and counseling services.

Suggestion
The suggestions in this research are as follows;

a. As a student majoring in guidance and counseling, I hope you can use this life skills development module as a reference material in improving your quality as a prospective counselor.
b. Students who have problems related to the achievement of life skills that are less balanced should make more use of this module as a reference material.
c. It is recommended for students if they want to improve their life skills in order to pay more attention to counseling skills in providing services at school.
d. This life skills development module deserves to be used as a guide in developing counseling skills. This is based on the evaluation results from media experts, material experts and field trials that have been carried out and are in the very good category, meaning that the module is feasible to use.
e. As a guide for prospective BK/Counselors, Lecturers, and Education Practitioners in carrying out counseling services in order to develop skills in counseling services by utilizing this module.

References


The Developing of Kirkpatrick's Evaluation Model on the Evaluation of Early Childhood Head Training in Early Children Education Development Center for Early Children and Community Education North Sumatera

Kristianus Mote
{mote.kris@yahoo.com}
Doctoral Student State University of Medan, Indonesia

Abstract. This study aims to determine the effectiveness of the training of the head of the early childhood education unit by applying the Kirkpatrick’s evaluation model and to determine the effectiveness of the training of the head of the early childhood education unit by applying other evaluation models. The research method used is a mixed method. Data collection techniques are observation and tests. The research sample was 94 heads of early childhood education units. The data analysis technique used is descriptive analysis. The research model test is the N-Gain Score test. The results showed that the effectiveness of the implementation of the Kirkpatrick’s evaluation model showed 0.42% in the medium category, while the Mote’s evaluation model based on the national education system and based on statistical methods showed 0.70% in the high category. Therefore, it is recommended to use the Mote’s evaluation model that so the high result.

Keywords: developing, kirkpatrick’s evaluation model, head of early childhood

1 Introduction

In the process of managing the quality of human resources through various forms of activities including training activities, the management function is known, one of which is the evaluation function. According to Stark, J.S. & Thomas, A. [1] that evaluation is a process or activity of selecting, collecting, analyzing and presenting information that can be used as a basis for decision making and further programming. Furthermore Stufflebeam, D.L. & Shinkfield, A.J. [2] says that evaluation is a process of providing information that can be used as consideration for determining prices and services from the objectives achieved, design, implementation and impact to help make decisions, assist accountability and increase understanding of the phenomenon. According to Kaswan [3] that training is the process of increasing the knowledge and skills of employees. Furthermore Meldon & Siswanto [4] says training is a systematic process of changing the behavior of employees in a direction to increase efforts to achieve organizational goals.

According to S. Eko Putro Widoyoko [5] says that an appropriate evaluation model as needed is needed in the process of managing the quality of human resources. Kirkpatrick's
evaluation model or the four level model is recognized as having advantages because it is comprehensive, simple and can be applied in various trainings. Comprehensive in the sense that the evaluation model is able to reach all sides of the training program. Simple in the sense that the evaluation model has a logical flow that is easy to understand and clear and uncomplicated categorization. It can be applied in various trainings in the sense that the evaluation model can be used to evaluate various types of training in various situations. Kirkpatrick's evaluation model or four-level model, namely reaction evaluation, learning evaluation, behavior evaluation and outcome evaluation.

According to Kirkpatrick, Donal L. & James D. Kirkpatrick [6] says that reaction evaluation is also called level one evaluation which aims to determine the level of satisfaction of training participants with the implementation of the training, namely the effectiveness of the training process which is realized by feeling fun, interesting and motivating. There are several aspects to measure the level of satisfaction of training participants, namely the service of the organizing committee, quality of instructors, materials, methods, class atmosphere, main and supporting facilities, value and meaning and others. The tool used to measure the reactions of the trainees is in the form of a questionnaire instrument. In compiling an instrument to measure the reaction of the ideal trainee from providing the maximum amount of information and requiring the minimum amount of time. According to Center Partners [7] says that the number of items includes no more than 15-25 questions, which are designed to obtain qualitative and quantitative data.

According to Kirkpatrick, Donal L. & James D. Kirkpatrick [8] says that learning evaluation is also called level two evaluation which aims to determine learning outcomes, namely cognitive, affective and psychomotor when participants return to work. There are several aspects to measure learning outcomes, namely comparing cognitive, affective and psychomotor outcomes before and after training. The tools used to measure the learning outcomes of the trainees are in the form of test instruments, questionnaires, interviews, observations and performance appraisal rubrics. Tests were used to measure the level of improvement in knowledge, questionnaires and interviews were used to measure attitudes and observations and a performance appraisal rubric was used to measure skill levels. To determine the level of improvement in these aspects, tests were carried out before and after the training. The use of comparison groups as a reference for the effect of training on participants. The control group if practical, evaluates knowledge, skills and/or attitudes both before and after the program, paper and pencil tests to measure knowledge and attitudes and performance tests to measure skills. This comparison group is a group that did not participate in the training. The group that participated in the training and the group that did not participate in the training were compared the development of knowledge, attitudes and skills over a certain period of time. Both groups were measured and the results of the two measurements were compared to determine the effect of the training program on the participants.

According to S. Eko Putro Widoyoko [9] says that behavioral evaluation is also called level three evaluation which aims to find out changes in behavior that occur after participants return to the workplace. There are several aspects to measure behavior, namely changes in mental attitudes, improving knowledge and adding skills. The tools used to measure behavior are in the form of observations and interviews as well as document analysis. The implementation of the behavior evaluation is carried out first by giving a pause for the transition period at the latest three months after the training. Behavioral evaluation is carried out more than once in a
sufficient time span to determine whether the change in behavior is temporary or permanent. Changes in behavior after returning to work are called outcomes.

According to S. Eko Putro Widoyoko [10] says that results evaluation is also called level four evaluation which aims to determine the impact of changes in the work behavior of training participants on the level of organizational productivity that occurs because participants have attended training. There are several aspects to measure the evaluation of the results, namely the work atmosphere, the level of work participation, the quality of work and others. The tools used to measure the results are in the form of observations and interviews as well as document analysis. In general, training materials do not have a direct impact on organizational results, besides that the calculation of aspects of an organization’s results is carried out in the annual report period, so this level four evaluation is difficult compared to the previous level evaluation so it requires a longer time span than behavioral evaluation. Level four evaluation is also called evaluation of training impact.

According to Brikerhoff, RD. Brethower, DM, Hluchyj. T., et al. [11] said that evaluation in training consists of seven steps as follows: 1) determine the focus to be evaluated. 2) develop evaluation design. 3) collect information. 4) analyze and interpret information. 5) make a report. 6) evaluation management. 7) evaluate for evaluation.

According to Lincoln & Arifin Zainal [12] said that evaluation in training consists of six components as follows: 1) Achievement and Accuracy of Training Objectives. In the evaluation, there must be a collection of information about the achievement and accuracy of the targets. This means whether the training has achieved the expected goals or not and whether these goals are in accordance with the training needs or not. 2) Training Materials. In the evaluation, there must be a collection of information about the material discussed during the training, including: a) Whether the material is in accordance with the objectives or not. b) Is the training material too simple, too difficult, too theoretical and so on. 3) Training Facilitator. In the evaluation, there should be a collection of information about “facilitators” who assist in the learning process. In this case, it is necessary to collect information about the facilitator’s ability to facilitate training. Matters that need to be evaluated include: a) Mastery and ability to use participatory methods. b) Mastery and understanding of training materials. c) Ability to communicate and interact with participants effectively. d) Facilitation team collaboration. e) Ability to use training media effectively. 4) Training Participants. In the evaluation, there must be a collection of information about the level of participation of participants, cooperation between participants, cooperation between participants and facilitators. In addition, the criteria for participants, whether the participants involved in the training meet expectations, as set out in the terms of reference for the training and so on. 5) Effectiveness of Training Methods. In the evaluation, there should be a collection of information about the effectiveness of the method. Is the method used to encourage participant involvement, is the method used in accordance with the objectives, is the method used in accordance with the content of the training material. 6) Training Committee. In the evaluation, it is more focused on evaluating the logistical aspects. Matters that need to be evaluated include: a) Communication, which is about how notification or invitation, is one type of evaluation of the organizer, whether the invitation is clear and accompanied by the required information, equipped with a training reference frame. b) Training support facilities and infrastructure which include basic training, for plenary discussions and group discussions, consumption, accommodation, availability and readiness of materials needed by participants, facilitators, committees and so on.
Based on preliminary research shows that the training of the head of the early childhood education unit using the Kirkpatrick’s evaluation model, the results of the training are less than high. Therefore, through this training, researchers conducted research on Kirkpatrick’s evaluation model or four level model, namely reaction evaluation, learning evaluation, behavior evaluation and result evaluation in order to find out and examine and provide solutions.

2 Research Methods

The research period is 36 months, starting from July 2017 to July 2020. The research site is at the Center for Early Childhood Development and Community Education in North Sumatera. This study aims: (1) to determine the effectiveness of the training of the head of the early childhood education unit by applying the Kirkpatrick’s evaluation model or the four level evaluation model, namely reaction evaluation, learning evaluation, behavior evaluation and result evaluation. (2) to find out the effectiveness of training for the head of the early childhood education unit by applying other evaluation models. Research method is mixed methods. Research approach is research and development. According to Nuryani Y. Rustaman, et.al. [13] says that the data collection techniques are observation and tests. Furthermore Sugiyono [14] says that the population of study were 140 head of early childhood education units. Furthermore Suharsimi Arikunto [15] says that the sample of study was 94 head of early childhood education units. Furthermore Zainuddin & Ghodang, H. [16] says that the research technique is descriptive analysis technique. Furthermore Meltzer [17] says that the test of research model is the N-Gain Score. Furthermore Ngalim Purwanto [18] says that the attendance test of the participants in study was the Science Process Test.

3 Result and Discussion

The Analysis of research data obtained 2 (two) results as follows: 1) Training Evaluation. The training evaluation used Kirkpatrick's evaluation model or four level model, namely reaction evaluation, learning evaluation, behavior evaluation and outcome evaluation. Results the data presented include the results of observation and test data. (a) Description of observation data. The description of the data is presented in Table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Experiment Class</th>
<th>Control Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Percentage</td>
<td>Description</td>
</tr>
<tr>
<td>1</td>
<td>Observation</td>
<td>72,69</td>
<td>Enough</td>
</tr>
<tr>
<td>2</td>
<td>Prediction</td>
<td>74,38</td>
<td>Enough</td>
</tr>
<tr>
<td>3</td>
<td>Classification</td>
<td>73,85</td>
<td>Enough</td>
</tr>
<tr>
<td>4</td>
<td>Communication</td>
<td>81,67</td>
<td>Good</td>
</tr>
</tbody>
</table>

Based on Table 1 shows that there are differences in the results of observations between the experimental class and the control class in training with the indicator as follows: 1) for the
experimental class, the highest indicator, namely communication, is obtained by a percentage of 81.67% with the good category, while the lowest indicator, namely observation, is obtained, the percentage is 72.69% with the enough category. 2) for the control class, the highest indicator, namely communication, was obtained by a percentage of 74.65% with the enough category, while the lowest indicator, namely classification, obtained a percentage of 70.56% with the enough category. b) Description of test data. The description of the data is presented in Table 2.

Table 2. Test Results

<table>
<thead>
<tr>
<th>N</th>
<th>Experiment Class</th>
<th>Control Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre Test</td>
<td>Post Test</td>
</tr>
<tr>
<td>Amount of Participants</td>
<td>47 Head</td>
<td>47 Head</td>
</tr>
<tr>
<td>Average Value</td>
<td>72.39</td>
<td>84.11</td>
</tr>
</tbody>
</table>

Based on Table 2 shows that the average pre test value for the experimental class is 72.39% and the post test average value is 84.11% and the N-Gain is 0.42% with the medium category, while the average pre test value for the control class is 72.90% and the post test value is 82.75% and the N-Gain is 0.36% with the medium category. From the achievement of the two N-Gain in the experimental class and the control class, it is known that the N-Gain value in the experimental class is higher than the N-Gain value in the control class, meaning that learning using Kirkpatrick’s evaluation model or four level model, namely reaction evaluation, evaluation learning, evaluation behavior and evaluation results for the experimental class can improve cognitive with the medium category. 2) Evaluation of the Developed Model. In training evaluation, the Mote’s evaluation model or five level model is used, namely reaction evaluation, learning evaluation, behavior evaluation, result evaluation and benefit evaluation. The results of the data presented include the results of observation and test data. (a) Description of observation data. The description of the data is presented in Table 3.

Table 3. Observation Results

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Experiment Class</th>
<th>Control Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentage</td>
<td>Description</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>Observation</td>
<td>82.97</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Prediction</td>
<td>89.36</td>
<td>Very Good</td>
</tr>
<tr>
<td>3</td>
<td>Classification</td>
<td>80.85</td>
<td>Good</td>
</tr>
<tr>
<td>4</td>
<td>Communication</td>
<td>82.55</td>
<td>Good</td>
</tr>
</tbody>
</table>

Based on Table 3 shows that there are differences in test results between the experimental class and control class in training with the indicator as follows: 1) for the experimental class the highest indicator is obtained, namely prediction, the percentage is 89.36% with the very good category, while the lowest indicator is classification, obtained a percentage of 80.85% with the good category. 2) for the control class obtained the highest indicator, namely communication, obtained a percentage of 83.82% with the good category, while the lowest indicator, namely
classification, obtained a percentage of 71.98% with the enough category. (b) Description of test data. The description of the data is presented in Table 4.

### Table 4. Test Results

<table>
<thead>
<tr>
<th>N</th>
<th>Experiment Class</th>
<th>Control Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre Test</td>
<td>Post Test</td>
</tr>
<tr>
<td>Amount of Participants Average Value</td>
<td>47 Head</td>
<td>47 Head</td>
</tr>
</tbody>
</table>

Based on Table 4 shows that the average pre test value for the experimental class is 60.49% and the post test average value is 87.80% and the N-Gain is 0.70% with the high category, while the average pre test value for the control class is 60.80% and the post test average is 77.21% and the N-Gain is 0.40% with the medium category. The pre test value of the experimental class and the control class is not much different, while the post test value for the experimental class is higher than the control class, as well as the N-Gain value for the experimental class is higher than the N-Gain value for the control class, meaning learning by using the Mote’s evaluation model or the five level model, namely reaction evaluation, learning evaluation, behavior evaluation, result evaluation and benefit evaluation for the experimental class can improve cognitive with a high category.

This research is discussed as follows: 1) Training Evaluation. The results of the observation and evaluation test of training using the Kirkpatrick evaluation model or four level model, namely reaction evaluation, learning evaluation, behavior evaluation and result evaluation showed 0.42% was in the medium category. This shows that the evaluation of moderate training results has the following characteristics: (a) understanding of reaction evaluation, evaluation of learning, evaluation of behavior and evaluation of training results is in the medium category. (b) willingness to try to improve the evaluation of reactions, evaluation of learning, evaluation of behavior and evaluation of training results including the medium category. 2) Evaluation of the Developed Model. The results of observations and training evaluation tests using the Mote evaluation model or five level model, namely reaction evaluation, learning evaluation, behavior evaluation, outcome evaluation and benefit evaluation showed that 0.70% was in the high category. This shows that the evaluation of high training outcomes has the following characteristics: (a) understanding of reaction evaluation, learning evaluation, behavior evaluation, evaluation of results and evaluation of training benefits are included in the high category. (b) willingness to try to improve the evaluation of reactions, evaluation of learning, evaluation of behavior, evaluation of results and evaluation of the benefits of training included in the high category. The evaluation model is presented in Figure 1.
In the training, there are five (5) stages of evaluation based on the national education system, namely: 1) reaction evaluation is input. 2) learning evaluation is process. 3) behavior evaluation is output. 4) result evaluation is outcome. 5) benefit evaluation is income. The five stages of evaluation each have aspects to be evaluated, namely 1) reaction evaluation is input. At the reaction evaluation stage, the aspects evaluated include the service of the organizing committee, the quality of the instructors, training materials, training methods, classroom atmosphere, main facilities and supporting facilities, the value and significance of the training content and others. The tool used to measure the reactions of the trainees is in the form of a questionnaire instrument. 2) learning evaluation is process. At the learning evaluation stage, the aspects that evaluated include cognitive, affective and psychomotor before and after training. The tools used to measure the learning outcomes of the trainees are in the form of test instruments, questionnaires, interviews, observations and performance appraisal rubrics. When evaluating learning, it is supported by instrumental input and environmental input. 3) behavior evaluation is output. At the behavioral evaluation stage, the aspects that are evaluated include changes in mental attitudes, improving knowledge and adding skills. The tools used to measure behavior are in the form of observations and interviews as well as document analysis. 4) result evaluation is outcome. At the result evaluation stage, the evaluated aspects include work atmosphere, work participation rate, work quality and others. The tools used to measure the results are in the form of observations and interviews as well as document analysis. 5) benefit evaluation is income. At the benefit evaluation stage, the aspects evaluated include independence, standardization, local excellence, international level orientation. The tools used to measure the results are in the form of observations, interviews, questionnaires, tests and document analysis.

The five stages of evaluation are reaction evaluation, learning evaluation, behavior evaluation, result evaluation and benefit evaluation, when conducting mandatory evaluations based on statistical methods.

4 Conclusion

This study was concluded as follows: 1) Kirkpatrick’s evaluation model or four level model, namely reaction evaluation, learning evaluation, behavior evaluation and result evaluation showed that 0.42% with the medium category. 2) The evaluation model developed, namely the Mote’s evaluation model or five level model, namely reaction evaluation, learning evaluation, behavior evaluation, result evaluation and benefit evaluation, when conducting mandatory evaluations based on statistical methods.
evaluation, behavior evaluation, result evaluation and benefit evaluation showed that 0.70% with the high category.

Acknowledgement
In the process of developing this model training evaluation, various elements have been guided, so I would like to thank the following elements: Reviewers, Nasrun as Professor of the Medan State University Postgraduate Program, Benjamin Situmorang as Professor of the Postgraduate Program at the State University of Medan. Therefore, the model is expected to be useful for all related elements in the training process in the context of developing human resources.

References
Peer Observation Effectiveness by Using Video and Whatsapp Messenger for Learning Improvement

Lenni Arta F Sinaga¹, Nasrun², Yuniarto Mudjisusatyo³
{lenniarta2013@gmail.com}

Student of Doctoral Study Program-Educational Management, Universitas Negeri Medan¹, Lecturer of Doctoral Study Program-Educational Management, Universitas Negeri Medan²³

Abstract. Peer observation is an alternative to supervision in PAUD, where educators can observe each other to develop effective learning. This study aims to determine the effectiveness of using video and WhatsApp messenger in peer observation to improve education. The subjects of this study were 16 educators in early childhood who were determined according to the research objectives. Data was collected by using interview and observation techniques. The study results found that using video and WhatsApp messenger in peer observation was very effective in improving learning. They were making peer observation activities able to continue without having to meet in person. Furthermore, peer observation is more flexible because it could be adjusted according to the conditions and agreement of the educator.

Keywords: video, peer observation, Early childhood education

1 Introduction

Early childhood education (PAUD) is a level of education before primary education as a coaching effort aimed at children from birth to six (Kemendikbud, 2014). PAUD units in Indonesia continue to increase both in urban centers, rural areas, and even throughout the country (Hudori, 2019). Nationally, PAUD units have reached 233,963 spread across 34 provinces in Indonesia, and there are even 7 (seven) PAUD units abroad, namely: 1 in Egypt, 2 in Malaysia, 1 in Myanmar, and 3 in Saudi Arabia. Specifically, in North Sumatra Province, there are 10,840 PAUD units spread over 33 regencies/cities, with details; 2,921 Kindergartens, 1948 Raudatul Atfal (RA), 5,430 Playgroups (KB), 77 Child Care Parks (TPA), and 464 Similar PAUD Units (Kemendikbud, 2020).

PAUD educators are the spearhead of early childhood education and the essential component in maximizing learning outcomes and teaching quality (Darling-Hammond & Youngs, 2002). Thus, PAUD educators must continuously improve their professionalism, especially in implementing the teaching and learning process. Peer observation is one approach that can be used to improve teaching practice. Feedback after observation contributes effectively to the development of reflective teaching (Siddiqui, Jonas-Dwyer & Carr, 2007) and a new strategy to improve the quality of learning and teaching (Hendry and Oliver 2012).

Peer observation and feedback vehicles for instructional improvement (Ridge and Lavigne 2020); on the other hand, advances in information technology also provide many benefits and conveniences for educators in educational programs (Özkan 2019). Peer observation also helps to improve professional development for school principals (Acree et al., 2017) so that its use needs to be maximized. The use of digital media has begun to be carried out among fellow practitioners.
educators so that they can see colleagues when teaching in other places "virtually" (Zepeda, 2013). New technologies also allow for real-time feedback on teaching and effectively enhance educator change (Weiss et al., 2020).

Video technology offers an opportunity to support educator learning because it can capture the richness and complexity of teaching by encouraging a deliberate examination of classroom practice (Borko, Whitcomb & Liston, 2009). In addition, a video providing greater access to classroom events without compromising on authenticity can provoke cognitive, emotional, and motivational processes (Seidel, Sturmer, Blomberg, Kobarg & Schwindt, 2011).

2 Research Methods

Researchers carried out field research procedures using descriptive data in written or spoken words, observed Behavior, and emerging phenomena. This research was included in a qualitative descriptive study—data collection techniques using interviews, observation, and questionnaires. Meanwhile, the data analysis uses the following steps: data reduction, data collection, data presentation, and conclusion drawing.

3 Result and Discussion

Peer observation is a visit made by educators to peer educators' classes to observe the ongoing learning process in peer educators' courses. By attending, peers help each other develop teaching, overcome weaknesses, share insights, and support each other. The results showed that the observations of fellow educators were carried out online using video recordings and WhatsApp when the covid-19 virus was running effectively. It's just that some technical obstacles become obstacles during the observation. The use of video and WhatsApp Messenger is an alternative as long-distance observation for educators in PAUD units. Using WhatsApp Messenger is more straightforward and relatively easy because it can be used via mobile phones.

The steps for using video and applications that are applied to peer observation are as follows:

a. Pre Observation
   Educators and colleagues discuss the focus, instruments, and schedule for peer observation through WhatsApp Messenger (it is recommended that educators have downloaded WhatsApp Messenger on their respective Android phones first).

b. Observation
   According to the agreed focus, educators record their learning using a video application, then send the video to fellow educators to observe. Educators who act as observers watch and observe the lessons that have been recorded in the video, write notes on the learning recordings in the video.

c. Post-observation
   Educators and peers together reflect on videos that have been observed by peers, educators who act as observers provide constructive feedback for learning improvement. The observed educators received input, and peer educators made learning improvements after receiving information and fellow educators.

Observations in the field obtained data that WhatsApp media has several advantages: easy, practical, fast, and saving internet data. Furthermore, WhatsApp can also be accessed only with mobile phones and has various features that can support communication with the help of internet.
services. For example, the group menu option is used as a place for educators to discuss. Therefore, Whatsapp is beneficial in communicating activities in distance learning amid current conditions (Ricu Sidiq, 2019).

Research data obtained from interviews with educators involved in peer observation found that peer observation has benefits, namely helping educators identify areas of strength in teaching to increase confidence and strengthen teaching skills and provide specific and unique peer feedback that can be used in teaching. Teaching portfolio as well as increasing collaboration through dialogue with fellow educators. The results also show that educators believe that the feedback obtained from peer educators is constructive. The relationship is collegial and symmetrical. The two educators involved did not find the process strenuous or stressful. Still, they appreciated the feedback as it improved their teaching.

Peer observation in teaching provides opportunities for reflection, improves teaching practice, and promotes supportive teaching relationships between educators. All participants in this study were willing to observe each other and give feedback to enhance learning. In addition, all participants in this study (100%) stated that their feedback was constructive if sharing it with colleagues would help them learn and have different ideas for the next class and activity. The use of video in the peer observation process also provides many conveniences. Sharing teaching videos with colleagues is done because educators can't observe each other's classes directly, especially during the covid-19 pandemic, which does not allow direct meetings; the use of videos provides the following benefits:

a. Completing the practice of peer observation due to difficulties in scheduling for class observations, making it more flexible in terms of time and place
b. Learning video recordings used in the peer observation process can be repeated if educators want to analyse more in learning practices
c. The introduction of video technology makes it easier for educators to observe their peers' instructions and give or receive instructional support.
d. Easy access to video cameras allows educators to record lessons so that other educators can view them at their own pace at any time.

During video observation, educators begin by observing one another in private. Then they meet to discuss the lessons and commit to making changes in practice. The cycle closes with the educator recording the implementation of this change and sharing the video with colleagues. In this way, video is used as an accountability mechanism to make feedback actionable. Video has the most robust evidence base to influence educator practice and child outcomes positively. Viewing high-quality teaching videos to use as models, discussing self-recorded videos with colleagues, and using self-recorded videos for self-reflection have been shown to change educator interactions and improve children's outcomes.

Videos allow educators to film their classes easily, especially with a smartphone app, and tag specific parts of the video with keywords. The main goal of observation is to learn from experience (Richards and Farrell 2010), which relies on memory and recording information during peer observation. Educators model lessons for colleagues, who then offer feedback and discuss how to incorporate similar teaching strategies into their own.

Based on the results of observations made by researchers on learning planning documents and learning videos and comparing previous conditions, there has been a significant change. Educators make learning improvements according to feedback from fellow educators, more quickly and easily, and flexibly according to the agreement of educators and fellow educators.

4 Conclusion
Based on the research, using video and WhatsApp messenger in the peer observation process received an excellent response from educators because they are more flexible when using them. It's just that several things need to be considered, one of which is the availability of internet data packages and the memory capacity of PAUD educators' cellphones. From the study results, the video-based peer observation process effectively improves learning improvements made by PAUD educators.

References


The Important of Maritime Education from an Early Age to Build Indonesian Identity as Maritime Country

Nuraeni1, Sarilah2, Gunarti Dwi Lestari3, Wiwin Yulianingsih4
Fakultas Ilmu Pendidikan dan Psikologi, Universitas Pendidikan Mandalika, Indonesia1, 2)
Fakultas Ilmu Pendidikan, Universitas Negeri Surabaya, Indonesia3, 4)

*nuraeni@undikma.ac.id, sarilah@undikma.ac.id, gunartilestari@unesa.ac.id, wiwinyulianingsih@unesa.ac.id

Abstract. Indonesia is an archipelagic state which has chance to become maritime country with adequate marine resources. One of government’s effort to achieve the goal is improving the maritime education sector. The implementation of maritime education can be done from an early age education until high education. However, in the implementation there are many constraints as schools has no curriculum and operational guidelines and lack of experts in maritime. Based on the constraints, practical solution is needed as there must be coordination in ministry to make the program can be implemented well. Besides that, to support maritime learning process at schools needed curriculum and operational guidelines accordance with area condition and students needed. Next, the experts need to be adjusted with their competent and knowledge field.

Keywords: Maritime education, early age, maritime country

1. Introduction

Indonesia is known to the world as archipelagic state which strategic for national and international cruise line. Indonesia as archipelagic state has wide ocean where the island is surrounded by the ocean. Indonesia ocean areas should be challenge to be managed, maintained and protected for the benefit of Indonesian nation Marsetio [1]. Indonesian ocean in this case has become national assets which can function as resource of ecosystem energy, resource of food, and media of inter-island communication, trade areas, and socio-cultural exchanges. Indonesia has chance to become maritime axis since Indonesia’s oceans are wide and support by adequate resource.

Muhammad [2] state that Indonesia not yet become maritime country because Indonesia’s status is an archipelagic state. The characteristic of maritime country is country which can take advantage from the ocean, even that country does not have many ocean, but it has ability in technology, knowledge, equipment to manage the oceans. Therefore, there are many maritime countries which not become archipelagic state yet because they cannot take the advantages from the oceans. It means, if Indonesia wants to be the axis of world maritime, Indonesia must become maritime country.

To become maritime country, Motik & Djalal [3] Indonesia has to be able to manage and utilize the oceans. In short, maritime country has to be able to utilize all the aspect of oceans to welfare of the people and the progress of the nation and also has to be able to maintain the security of the oceans from law violation. Tinambunan [4] state that to support
Indonesia to become maritime country need role and participation of the community and government. As for the government’s efforts in empowerment, it is by increasing natural resources through the education sector in order to be able to manage marine resources optimally.

Indrawanto [6] to realize the government’s program to become maritime country from education sector, Coordinating Ministry of Maritime and Ministry of Education, Culture, Research and Technology design a new program named maritime curriculum. Maritime Curriculum program is started in 2018 with pilot project in 13 locations as Aceh, Banten, West Java, Jakarta, Bengkulu, Central Java, East Java, North Kalimantan, South Sulawesi, West Nusa Tenggara, Maluku, East Nusa Tenggara, and West Papua. Whereas, in 2018 maritime curriculum has been done in North Sumatra, Riau, West Sumatra, Bangka Belitung, Jambi, South Sumatra, Lampung, Jogyakarta, Bali, West Kalimantan, South Kalimantan, East Kalimantan, Central Kalimantan, West Sulawesi, Gorontalo, North Sulawesi, North Maluku and Papua. The aimed in maritime curriculum, students are expected to solve the problem especially in coast areas. Besides that, students are expected to increase their knowledge about maritime.

Maritime curriculum program is curriculum program based on historical maritime, culture value maritime, and potential maritime for increasing love for the homeland and spirit in defending the country with maritime character, Asrini [7]. The important of maritime education in Indonesian national development is to reach prosperity as maritime country, Indrawanto [6]. The aimed of maritime education is to build pattern of thought or point of view of our self and environment as a maritime country which can influence the thoughts, manners, and actions, Sulistyono [8]; Syarah, Yetti, Fridani, Yufiarti, Hapidin & Pupala [9]. Besides that, the aimed of maritime education is to introduce the potential of marine and fishery at coast of Indonesia to young generation, so that it can arouse the spirit of love for the sea in the community.

Furthermore, maritime education can shape human behavior and procedures as a society that has a love for the sea and utilization of all the potential of maritime wealth that exist in, above, and around the sea to meet the needs of people’s live and economy of the country now and in the future, Siswanto [10]. Generally, it can be concluded that the aim of maritime education is to give extensive knowledge especially in how to manage high quality marine resource, Baylon [11].

In Indonesia, maritime education can be implemented from early age education until high education. Especially, in this case the highlight is maritime education for early age. Early age education in this case is the education before elementary school, it is the effort of coaching for new born until 6 years old to help physical and spiritual growth and development from formal, informal and non-formal way. In addition, in age of 0-6 years, the children’s brain grows rapidly, so that brain can receive much information, Santrock [12]. This is the reason why maritime education is good for early age.

Besides that, the information is gotten by the children in learning process indirectly can grow their understanding of something, Gunawan, Wibowo, Purwanto & Sunawan [13]. The children understanding is the result of cognitive representation and the conception of children. This statement is strengthened by Garcia, Hart & Johnson-Ray dalam Santrock [12] state the children can learn how to find and construct about something that they learnt. One of the ways that can be used to help early age in understanding the material of learning is by increasing self-recognition of children visual, Baron & Donn [14]. In this case, teacher can give toys which can be used to introduce maritime method, for example, puzzle of the
underworld, Lego of ship, Kahirunynas, Hasmunir & Desfandi [15] and show the videos about history of Indonesia oceans, Cooper [16].

Maritime education for early age can be assume as the solution to increase human resource in the future, especially in manage the resource of the marine in Indonesia. However, until now there are many obstacles in implementation of maritime education in Indonesia because of lower integrity between ministries in coordination of program’s implementation, Supriyadi [17]. Besides that, according to Siswanto [10] and Arini [7] schools do not have curriculum and operational guidelines which is suitable with the condition and students need, especially at coast. This issues also happened in Kenya, Helen [18] state that curriculum for early age is not applied correctly by the teachers at schools. It caused the society at coast of Indonesia do not understand how important to manage marine resource.

Another constraint is lack of expert who master’s in marine world. That statement is suitable with Baylon & Santos [19], Gecara [20], dan Pallis & Adolf [21] state that lack of expert in maritime education, so that the transfer of maritime culture will be hampered because the lack of understanding about the material to the students. Especially in early age education the maritime theme has never been taught because the lack of ability and no guidelines to deliver the material to the students, Zellawati [22].

Pay attention for that, it is needed the practically solution as good coordination at ministry to build the program that has been developed. Besides that, to support the learning process of maritime, curriculum and operational guidelines is needed to be done suitable with the condition in the area and student’s need, (Nurisshobakh, Prameswari, Utomo & Radianto [23]; Ismail & Habibah [24]. In addition, using the experts need to be adapted in accordance with the scientific field.

To achieve the aim, in the development program of maritime education it has to put the characteristic of maritime and culture of nautical in learning process. In the future, hope that this activity can build the good character of Indonesian especially about local wisdom. The discussion of this research is about to explain the role of early age education using curriculum which is built up based on the condition of the area and student’s need to optimize nautical potential.

2. Result and Discussion

Education is the process of changing the attitude and behavior of someone or people to be mature enough through education and training, Masnur [25]. Maritime is the part of activity in the ocean or marine especially about shipping, trade, national and international port named maritime activity, Djuanda [26]. Maritime education is an effort to change the attitude, build the behavior, self-controlling, and build the skill to manage marine resource, Indrawanto [6]. Besides that, according to Sahriana, Suminar & Pranoto [27] maritime education is an effort to give knowledge and introduce marine life to the children.

Marine education must be adjusted with the curriculum based on the knowledge of maritime history, maritime culture value, and maritime potential to increase love for the land and spirit of defending the country with maritime character, Asrini [7]. The important of maritime education in Indonesian national development is to reach prosperity and success as maritime country. Baylon & Santos [19] state that maritime education must be support by the facility, curriculum design and qualified learning method to produce qualified and competent resource.
Maritime education is important to be applied to students who study at coast school. The aim of maritime education is to give knowledge about how to manage qualified marine resource, Baylon [11]. Generally, managing marine resource need to be optimize to increase quality and prosperity the nation. Maritime is one of the main purpose development in Indonesia which focus on managing the marine resource. Besides that, to support the vision of development of national maritime is needed effort of curriculum diversification through insert more maritime characteristics and skills in education process, Kahirunnas, Hasmunir & Desfandi [15].

In Indonesia maritime education can be applied in early age until high education especially, in this case the highlight is maritime education for early age. Early age education in this case is the education before elementary school, it is the effort of coaching for new born until 6 years old to help physical and spiritual growth and development from formal, informal and non-formal way, Directorate Early Childhood Education [28]. In addition, Hatch [29] state that early childhood education focus on learning in cognitive development for children.

Early age education is important for children development as cognitive, affective and psych motoric because from the learning process children can decide for future education. Skjaeveland [30] state that children experience in early age learning is obtained through the environment can stimulate the children to have good understanding about something. That statement strengthens by Nurani in Early Childhood Education Directorate [31] state that early childhood education can develop their potential optimally, children become more independent, discipline, and easier to understand the knowledge optimally when study at elementary school.

Given the importance of early childhood education, it is appropriate for the children to get chance and good service in education. However, not all the early childhood gets the chance and service that appropriate with government program. Akrim & Harfiani [32] state that there are many early childhoods who have no receive qualified education facility. In addition, early childhood who have no receive qualified education facility are the children who live far from central government, central city and society who live far from transportation access, Early Childhood Education Directorate [31]. One of society who have many early childhoods but don’t have qualified service is the children who live in the small island or gili. The right for children who live in gili is identical with other children, but this group have no qualified service in education.

Early childhood education is the educational process which aim to increase children basic potential through develop aspects in children simultaneously and sustainably, Sulistiani & Arya [33]. Education process can be developed the children’s aspect simultaneously and sustainably will occur if the educational process is adapted to the experience, environment and daily conditions of the children. This statement is supported by Skjaeveland [30] said that the early childhood learning process must be adapted to environmental conditions in which they live by prioritizing local wisdom-based understanding. In this case, the development of basic potential will be maximized if the educational process is based on experience, knowledge and life problem faced by children on daily life. Therefore, early childhood education in archipelagic areas close to the coast needs to be prepared and the content of the educational process designed that is adapted to the characteristics of the local community.

Through maritime education, it is hoped that educational program service can balance all dimensions of competence, intelligence and developmental scope of every early childhood who attends education in early childhood education institution so that they become more effective and optimal. In general, the context and content of maritime education can be
introduced to the children can be form in maritime history, maritime cultural values, maritime potential, values of love for homeland and positive character of maritime as well as the advantages of Indonesia as a maritime nation and state. Each context and content of the material is integrated in every early childhood education unit starting from the education unit level curriculum (KTSP) to its operation in learning, Early Childhood Education Directorate [31].

Sulistiani & Arya [33] reveal the purpose of maritime education in Early childhood education unit in general to realize the personality of the students, attitudes, knowledge and skill related to maritime from an early age in order to strengthen the competence of students in the field of basic literacy, as a foothold in realizing Pancasila students from an early age that is line with the aims of national education. It is hoped that in every generation of the nation there will be a balance of ownership characters from an early age, namely continental (land) character, and maritime (oceanic) character. Thus, in the future Indonesia’s human resources and become Pancasilaist citizens who have full capability in participating and advancing their nation.

The implementation of maritime education in each early childhood education unit or institution uses a diversified and harmonious integration approach. Meanwhile, the integration process of maritime education is carried out by unifying and transplanting the context and content of maritime education (starting from objectives, materials, activities, and assessments) and is carried out both at the preparation or planning stage, implementation to the evaluation stage. So, the approach to diversification and integration of maritime education in early childhood education unit or institutions will be implemented in entirety. The result of this diversification and integration will be seen clearly, both in KTSP document of the institution or unit, as well as the program documents developed, the methods activities are carried out, the media or learning resources used, as well as the assessment practices carried out, Early Childhood Education Directorate [31].

To produce an optimal quality of diversification and integration of maritime education based on the above stages, in its operations it still refers to the principles used in the implementation of the 2013 Early childhood education curriculum, named child-centered, contextually developed curriculum, covering all dimensions of competence and development program as the basis for forming the child’s personality, paying attention to the next level of child development, considering children’s learning methods, holistic integration, learning through play, providing learning experiences, paying attention and preserving socio-cultural characteristics. This statement reinforced by MacQuarrie, Nugent & Warden [34] who revealed that nature-based learning is a type of early childhood education that is very popular today and where learning emphasizes socio-cultural contexts that can have a major influence on children’s learning practice in everyday life.

The maritime curriculum in this case is prepared by carrying out religious values and character values developed, including; honest leadership, creativity, responsible spirit, discipline, loving the sea, protecting the sea and preserving the marine environment. The application of fun, creative, participatory. The learning model is using a group, the realization of its activities in one day children will play which contain various activities. The special programs as the flagship program of this maritime Early Childhood Education unit are in the form of; (1) optimizing existing materials and tools in the marine coastal environment as the main natural material media; (2) introducing and instilling maritime education from an early age, including the introduction of maritime education from an early age, including the introduction of maritime–related arts and culture; (3) introduction of local wisdom related to the marine environment; (4) development of children’s talents and interest with regard to
maritime affairs; (5) maritime ecotourism activities; (6) parenting activities; (7) family fun day; and (8) performing arts activities from and by the children. Learning activities carried out by utilizing the natural surroundings wrapped in local cultural wisdom are very good in increasing understanding of needs of students, MacQuarrie, Nugent & Warden [34]. In addition, learning using the natural environment is considered a learning and playing process that is very suitable for the needs of early childhood, Ouvry [35].

The learning strategies used in this archipelagic Early Childhood Education are as follows: (1) invites children to know the environment of the archipelago more carefully which includes biological potential, geography, socio-culture, profession and transportation. Through indoor and outdoor activities; [2] fostering children’s love for archipelagic region which includes biological potential, geography, socio-culture, profession and transportation; (3) foster a sense of belonging, respect in children about the archipelagic environment which includes biological potential, geography, socio-culture, profession and transportation; and (4) introduce children to the environmental management of their archipelagic territory which includes biological potential, geography, socio-culture, profession and transportation.

3. Conclusion

Based on the discussion above it can be concluded that theoretically maritime education through internalization maritime culture with local wisdom indirectly can increase religion value and leadership value, honesty, creativity, responsibility, discipline, love the sea, protect the sea, and preserve the marine environment. One of the effort that can be done to develop maritime potential in Indonesia is increase education sector as the place to develop learner potential especially in early childhood education through developing curriculum in local wisdom basic according to learner’s residence.

In addition, Alexander [36] state that it is interesting to do research about perspective natural learning, in this case is about maritime. This paper give description in producing new understanding about maritime education based on local culture of Indonesian coast. Besides that, to overcome prejudice and ambiguity, it is possible to use empirical and critical comparisons in future research. Furthermore, future research can develop a set of learning based on local wisdom as an alternative solution in conducting maritime learning so as to make easier for teachers to convey material to learners. By considering this, we have indirectly preserved the significant and meaningful culture of Indonesian nation, so that early childhood can gain an understanding of how nature is a regulation and resource that can play a central role in life.

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Development of Android Digibook Project Learning–Based on Research Method Subject in Guidance and Counseling Department of UNIMED

Albert Pauli Sirait1, Abdul Munir2, Rafael Lisinus Ginting3
{albertpaulis@gmail.com}

Science of Education Faculty, State University of Medan, Medan, Indonesia

Abstract. This study aims to create a digital textbook based on project-based learning in research methods courses. Digital Book (Digibook) Android is a digital book in android format that can be accessed using a smartphone. The research method used is Research and Development (R&D) using the ADDIE model. The development stage is the stage of manufacture of digibook android based in accordance with the design plan. Media experts give excellent ratings for throughout the item with the total amount of 82.50 with an average value is 4.10 and the results of the calculation for the item throughout the expert assessment of as many as 20 items of material obtained a total of 86 ratings with an average value is 4.30 so that it can be concluded that the application and the material is very viable for use in learning English. This application is tested on 30 students of the 1st half of Guidance and Counseling Department of the Faculty of Education Unimed. The results of calculations throughout the student questionnaire responses obtained 87.15% percentage of aspects of good feelings, 86.57% of the student's interest aspects of the use of the application, 85.85% of aspects of attention, and 88.24% of aspects of student involvement. Viewed from a fourth aspect of the students showed a very positive response, so it can be seen that the interest of students towards Digibook Android based on research methodology subject.

Keywords: Digital Book, Android, Research Methodology

1 Introduction

The development of technology in the world of education in the 4.0 revolution era has changed the conventional learning system into a modern learning system, demanding innovations in the delivery of learning. Then this challenge makes changes that occur in the learning environment and helps the movement of the learning process, especially in lessons. According to Akhbar Galang M, et al (2015) the use of Science and Technology (IPTEK) in the world of education is something that is considered very important for changes in the learning system. Science and technology have changed the conventional learning system into a modern learning system based on information and communication technology (Information and Communication Technology [ICT]). Some of the technologies used as learning media are computers and smartphones with internet.

Preliminary studies have been carried out by researchers through online interviews with students majoring in Guidance and Counseling, Faculty of Education, State University of Medan. The researchers conducted these interviews to find out the obstacles and difficulties
they experienced during the distance learning (online) they were undergoing during the covid 19 pandemic. Based on the interviews and observations that the researchers had conducted, several conclusions were drawn, namely, (1) In this era of the covid 19 pandemic, students find it difficult to find learning resources that match what they need because of the absence of activities in each library (2) Students need an interesting and easy textbook to carry whenever and wherever (3) Students need teaching materials that encourage them to learn independently.

In this digital era, technology is not only used as a medium for implementing learning but is also used as a medium for learning tools, one of which is the Digibook or digital book. Digibook is made using various android-based e-PUB maker software. One of them is the Sigil ePUB-Maker Software, which is software used to create android-based digital books. The advantage of Sigil ePUB-Maker Maker compared to other software is that Sigil ePUB-Maker can be accessed without the internet and in it can be inserted images, videos, and audio and can be saved in apk format to be shared easily via android devices. This can facilitate the process of providing teaching materials to students for the smooth learning process.

There are several similar studies that have been carried out before including research conducted by Ebied and Rahman (2015) with the title "The Effect of Interactive Ebook on Students Achievement at Najran University in Computer in Education Course" which states that students who learn to use e-books interactive, can increase learning motivation and develop academic achievement compared to students who learn to use textbooks. Another study from Kwang and Raied (2012) entitled " The Design and Development of Mobile Collaborative Learning Application Using " which proves that learning using mobile phones provides convenience because learning can be done anywhere and anytime. Learning with mobile phones using android applications can make students actively build their own thinking in learning.

One approach to contextual learning is project-based learning (PBL). According to Loyens et al (2015) PBL is a distinctive form and is a research-based cooperative learning characterized by active student involvement and comparative learning. Kokotsaki et al., (2016) said that students who study through the PBL method usually work together to solve certain problems, develop products for certain targets, and then evaluate projects and also evaluate the development process.

Based on the background and explanation above, the researcher wants to conduct research entitled " Development of Android Digibook Based on Project Based Learning in Research Methods Course in the Guidance and Counseling Department of Unimed". Some of the questions that will be answered in this research are: (1) What is the form of the Android Digibook in the Developed Research Methods course based on the Project Based Learning Model ? and (2) What is the Student Interest in the Developed Android Digibook?.

2. Literature review

Digibook (Digital Book)

Digital book is a book published in digital form. Digital books come in many different formats. To be able to read digital books, an ebook reader is needed on a computer or smartphone. According to Margolin (2013) a digital book which is often known as an e-book is a publication consisting of text, images, and sound published in digital form that can be read on computers or other electronic devices. E-books or digital books have various types of file formats, including PDF (Portable Digital Format) created by Adobe, EPUB (Electronic Publication) which is a format formed by the Open Forum of the International Digital Publishing Forum (IDPF), (AZW (Amazon) Word), MOBI (MobiPocket) and PRC (Product Representation Compact)) which are used by Amazon for the ebooks it sells (Online Book: Fuad
The other formats are JPEG (Joint Photographic Expert Group) and HTML (Hypertext Markup Language) (Hadi A, et al; 2015). So it can be concluded that the format of a digital book does not only have one format in use, but there are more than one format to be used according to the required needs.

Android Application
According to Nasrudin Safaat (2012) android is an operating system on mobile phones that is open and based on the Linux operating system. Android can be used by anyone who wants to use it on their device. Android provides an open platform for developers to create their own applications that will be used for various mobile devices. Android according to Satyaputra and Aritonang (2014) is an operating system for smartphones and tablets. The operating system can be illustrated as a bridge between the device and its use, so that users can interact and run applications available on the device.

Project Based Learning Learning Model
One of the innovative learning models is project-based learning, where students are focused on an actual problem that adheres to the core concepts and principles of a discipline with various activities such as information seeking, problem solving, and product creation. There are several opinions regarding the understanding of project-based learning models. Project Based Learning according to Purnawan (2007) is a systematic teaching method that involves students in learning complex knowledge and skills, authentic questions and product and task design. Then Barron Kokotsaki et al., (2016) said that students who study through the PBL method usually work together to solve certain problems, develop products for certain targets, and then evaluate projects and also evaluate the development process.

Thomas (in Wena 2009) states that project-based learning is a learning model that provides opportunities for teachers to manage learning in the classroom by involving project work. According to Clegg & Berch in (in Wena, 2009) through learning project work, students' creativity and motivation will increase. Slightly different, the concept of project-based learning expressed by Thomas and Clegg & Berch emphasizes learning as a project work, to increase students' creativity and motivation in learning. Thus, a project designed directly requires students to be active in conducting research, collecting data and information, analyzing data to designing and manufacturing products that are solutions to the problems posed.

3 Research Methods

Types of research
The type of research used is research (R&D). Sugiyono (2007) states that the development method is a method used to produce certain products and test the effectiveness of these products. This research was synthesized to develop an Android digital book product for research method courses that can be used in online learning.

Development Model
This research is a Digital book android development. The research procedure for developing Digibook Android-based adapts the ADDIE development model, which is a model that includes 5 stages including analysis, design, development, implementation and evaluation (Mulyanta & Leong, 2009).
Research Instruments

Instruments that are used in research this is a questionnaire assessment of media by using questionnaires. A questionnaire based on three main criteria of learning media according to Walker and Hess (Arsyad, 2010), namely the quality of content and objectives, instructional quality, and technical quality.

3 Result and Discussion

3.1 Development Digibook-Based Android On Research Methodology Subject For Guidance And Counseling Students.

Based on the process of implementing development research, the results of the research carried out were carried out in the following way. The stages of this research use the stages of ADDIE development, namely Analysis, Design (design), Development (manufacture), Implementation and Evaluation.

Analysis Stage

The development of this media begins with analyzing some of the necessary needs. These needs include: the selection of materials and the determination of the user (user), to be used as a reference in the development digibook android based.

a. User (user)

The target users of the Digibook developed are students of the Guidance and Counseling Department at the Faculty of Education, State University of Medan. Based on interviews with several students, it is shown that learning using mobile devices (smartphones) is very interesting for them and can help students learn independently whenever and wherever. Based on a preliminary study conducted by researchers through observations and interviews, data obtained that the average student has an Android smartphone which of course can access the Digibook that will be developed.

b. Material Needs

The content referred to in this case is the learning material for the Research Methods course. Several learning topics that have been prepared by the researcher are then shown to students, then the researcher conducts interviews. Students were asked to rate how important these topics were to them based on the needs they encountered in the lectures. The question that the researcher asked was about how important the topics that had been prepared were studied to develop students' abilities in the student Research Methods course.

Based on the interviews conducted by the researchers, it was concluded that the core material that will be included in the Android-based Research Method Learning Digibook is as follows:

- Research paradigm
- Quantitative research
- Qualitative research
- Research and development, and
- Quotations and bibliography

Furthermore, for learning materials needed by students to be displayed on the digibook application. Researchers obtained data that on average students think that audio and video media are very important media in learning Research Methods. So to annul student needs, the researchers will include several additional features such as practice questions and videos related
to research methods courses. The video presented is a video about phenomena or symptoms related to the field of guidance and counseling which will then be used as material for student projects in these courses.

Product Design Phase (Design).
The Digibook product design in this study was divided into two parts, namely the development of project-based research method teaching materials and the development of the Android-based digibook research method teaching materials.

a. Teaching Development of Project Based Learning Research Methods
At this stage the researcher develops teaching materials based on the components contained in the project-based learning model, namely:

- Authenticity. The project that will be carried out by students in the teaching materials of the research method courses developed in this research is related to real-world problems which of course are related to the Guidance and Counseling field. In this component, students are guided to be able to overcome problems or questions that have meaning for students, involve problems or questions that are actually experienced by students in the real world, ask students to produce something that has personal and or social value.
- Adherence to academic values (academic rigor). In the developed teaching materials, students are challenged to work on a project using the inquiry method.
- Relationship with experts (expert relationship). The power of project-based learning lies in the involvement of experts or experts outside the classroom. In the teaching materials developed there are items that require students to be able to get in touch with experts to discuss matters relating to the project to be completed.
- Active research (active exploration). Each material and sub-material contained in the teaching materials is designed to encourage students to be active in research, explore, analyze and present project results.

In making these teaching materials, the researchers conducted discussions and asked the opinion of their lecturers who were considered experts in the field of teaching materials and learning models.

b. Initial Design of Digibook Products
After the stage of analysis and manufacture of project-based learning-based textbooks, the next stage is to design a product in the form of a digibook. The initial design of the Android-based Digibook application product is divided into 2 designs, namely the design for the front-end, namely the design for the user (students who take the Research Methods course) and the back-end design, namely the design for administrators, namely lecturers so that they can update their digibook at any time. developed.

c. Digibook Display Design.
1) Initial View of the Application
The initial view of the application (login) is the display after the application is accessed by the user. In the display there are two fields that must be filled in by the user, namely the username and password. The form of the display is shown in Figure 1 below.
Students who are registered as participants in the Research Methods course will be given a password by the lecturer who also acts as an admin on this Digibook.

2) Front View Design

The front screen is the display that appears after the student has passed the Login stage. On the front screen you will see a menu. In the first menu "About" is a menu that displays about Digibook products, the second menu "Materials" is a menu that contains materials and sub-materials that will be discussed in lecture activities, the third menu "6 assignments" is a menu that will display sub menu items 6 tasks of the KKNI. The fourth menu is the RPS menu. The initial design of the digibook menu display can be seen in Figure 1 above.

3) "Home" Display Design

The “Home” menu is a menu that contains things related to Digibooks, such as; 1) The name of the Digibook, 2) the purpose of the Digibook, 3) how to use the Digibook.

4) Material Display Design contained in the "Home" sub menu.

The material menu is a display in which there are various kinds of material that are in accordance with the teaching material in the online version of the Research Methods course, both in written form and in the form of images and videos. This menu also contains RPS (Lesson Plan) and PowerPoint. The material display design is shown in Figure 3 below.
5) Six Task View Design

In addition to supporting the blended learning model, this Digibook is also designed to support 6 tasks determined by the KKNI curriculum applicable at Medan State University. On the 6-task menu there is a detailed explanation display of 6 tasks that students must do. The display design is shown in Figure 4 below.

![Menu Display Design 6 KKNI Tasks](image)

**Product Development Phase (Development).**

The development stage is the stage of making Digibook. In making this Digibook, it is adjusted to the design. First, the materials used to fill the content in this Digibook are collected, such as images, videos, and animations. These materials are obtained by using electronic books, Google and YouTube. After all the materials have been collected, the next step is to make the Android version of the Digibook using the Sigli software. The display of Digibook android-based after developed is shown in Figure 5 below.

![The Display of Digibook](image)

**Implementation Phase (Implementation)**

The implementation phase contains product trials that have been developed to a number of respondents. In the implementation, the researcher makes a learning scenario with the Project Based Learning model. The implementation of Project Based Learning consists of 4 meetings, namely 2 face-to-face meetings and 2 online meetings using an android application for Research.
Method lectures. During the trial, the researcher asked 2 experts, namely an expert on teaching materials, media and learning models and a material expert to provide an assessment of the Digibook product.

a. ExpertValidation

Before the product was used, the researcher asked for the assessment of the Research Methods Material Expert and the Digital-based Learning Media Expert.

1) Media Expert Assessment Results

Media expert gave excellent ratings for the item throughout the total number of 82.50 with an average value is 4.10. Based on the total and average values, it can be concluded that the Android Digibook "BK Research Method" is feasible to use in learning with the blended model.

2) Material Expert Assessment Results

Material experts are respondents who assess the feasibility of the material content contained in the developed digibook media. In this study, the material expert that the author appointed is an expert who really understands how to design interesting learning based on the material and sub-materials in the Research Methods course and has a scientific background related to learning Research Methods in the Guidance and Counseling field and understands models learning model. The material expert also gave a very good assessment of the material that the researcher had displayed on the product. The results of the calculation for all items in the material assessment, namely as many as 20 assessment items, obtained a total of 86 with an average value of 4.30. Based on the total and average values, it can be concluded that the material contained in the android Digibook "Research Method for Guidance and Counselling" based on project based learning is feasible to use in learning.

3) Application of Digibook in Research Method Learning

Project Based Learning Research Methods course learning is a model used by researchers to find out how to apply Android-based English for Counseling application products in the teaching and learning process. The scenario determined by the researcher is that there are 2 face-to-face learning and 2 online learning sessions. At meetings 1 and 2 (face-to-face learning) the material studied includes the use of to be and subjects and objects in the Research Method. Then at the 3rd and 4th meetings (online learning) the material studied is present tenses and past tenses in research methods. There are 30 students who take part in this lesson. The android application has been installed on the cellphones of the 30 students.

b. Student Interest in Learning Using Digibook

Students are asked to fill a questionnaire responses to pass judgment on each indicator by affixing a check mark (✓) in the range of answers to figures that are considered appropriate. There are 20 statement items that must be filled out by students. The results of the student response questionnaire obtained a percentage of 87.15% on aspects of feeling happy, 86.57% on aspects of student interest in using applications, 85.85% on aspects of attention, and 88.24% on aspects of student involvement. Looking at the four aspects, it shows a very positive student response, so it can be seen that students' interest in learning Research Methods using Android Digibooks is based on project bases learning.

Evaluation Stage

The evaluation was carried out in order to improve the appearance and menu of the Android Digibook. In this study, suggestions and criticisms from respondents are summarized which are divided into 3 aspects, namely, software engineering, learning design and visual communication.
The researcher conducted a preliminary study through online interviews with students majoring in Guidance and Counseling, Faculty of Education, State University of Medan. The researchers conducted these interviews to find out the obstacles and difficulties they experienced during the distance learning (online) they were undergoing during the covid 19 pandemic. Based on the interviews and observations that the researchers had conducted, several conclusions were drawn, namely; (1) In this era of the covid 19 pandemic, students find it difficult to find learning resources that match what they need because of the absence of activities in each library (2) Students need an interesting and easy textbook to carry whenever and wherever (3) Students need teaching materials that encourage them to learn independently.

In this digital era, technology is not only used as a medium for implementing learning but is also used as a medium for learning tools, one of which is the Digibook or digital book. Digibook is made using various android-based e-PUB maker software. One of them is the Sigil ePUB-Maker Software, which is software used to create android-based digital books. The advantage of Sigil ePUB-Maker compared to other software is that Sigil ePUB-Maker can be accessed without the internet and in it can be inserted images, videos, and audio and can be saved in apk format to be shared easily via android devices.

Based on the background and explanation above, the researcher wants to conduct a research entitled "Development of Android Digibook Based on Project Based Learning in Research Methods Course in the Guidance and Counseling Department of Unimed".

Some of the questions that will be answered in this research are: (1) What is the form of the Android Digibook in the Developed Research Methods course based on the Project Based Learning Model and (2) What is the Student Interest in the Developed Android Digibook?.

The development of this Digibook material begins with analyzing some of the necessary requirements. These needs include: the selection of materials and the determination of the user. The target users of the Digibook developed are students of the Guidance and Counseling Department at the Faculty of Education, State University of Medan.

After the analysis stage, the next stage is to make a product design in the form of an Android Digibook. The next step is product development where the initial design of the display that has been determined is then visualized in the form of an image using Sigil ePUB-Maker. The implementation phase contains product trials that have been developed to a number of respondents. In the implementation, the researcher makes a learning scenario with the Project Based Learning model. The learning implementation consists of 4 online meetings using the Zoom web meeting for Research Method lectures and Digibook as teaching materials. During the trial, the researcher asked 2 experts, namely a media expert and a material expert to provide an assessment of the application product.

Media experts gave a very good rating for all items with a total of 82.50 with an average score of 4.10 so that it was concluded that the application was very feasible to use. The results of calculations for all items in the assessment of material experts, namely as many as 20 assessment items, obtained a total of 86 with an average value of 4.30. Based on the total and average scores, it can be concluded that the material contained in the Digibook is suitable for use in teaching Research Methods courses.

To find out the interest of the students towards learning is most students are asked to fill a questionnaire interest. The results of the calculation of the response questionnaire for all students obtained a percentage of 87.15% on aspects of feeling happy, 86.57% on aspects of student interest in using applications, 85.85% on aspects of attention, and 88.24% on aspects of student involvement. Looking at the four aspects, the students' responses are very positive, so it can be seen that students' interest in learning Research Methods using Project based learning Android-based Digibooks is very high.
4 Conclusion

Lecturers should develop portable and attractive teaching materials and it is necessary to innovate in online learning (M-Learning) which is guided by techniques and teaching approaches in the subjects taught and lecturers should carry out learning with the Project Based Learning model because it is based on the observations of researchers. The Project Based Learning model and the use of online learning media are very effective and good for increasing student motivation and learning outcomes, especially in learning during the COVID-19 pandemic.

References

Development of 21st Century Lecture Model

Roni Sinaga
{ronisinaga@unimed.ac.id}
Universitas Negeri Medan, Medan, North Sumatera, Indonesia

Abstract. In the 21st century, lectures are changing as an adaptation to the times, mastery of skills such as study skills, something that students need to prepare for their future. This study aims to develop a lecture model called the 21st century lecture model, this model implements team-based projects, case methods and off-campus learning experience programs into the KKNI curriculum which is identical to blended learning, flipped classrooms and six types of assignments, as an effort to improve 21st century skills. This research uses research and development methods created by Borg and Gall. The results of this study are the creation of a valid 21st century lecture model, based on the validity test to experts found an average the average score of 0,95 in the very high category, and the score of the ICC test results is 0,571 indicating an understanding between experts in validating.

Keywords: Lecture Model, 21st Century Skills.

1 Introduction

In today’s global development, 21st century skills are very important, these skills must be mastered properly so that college can face their future, 21st century skills are learning skills, literacy skills, and life skills, lectures in the 21st century need to consider the relevance of lectures to future needs so that they can be useful for students, lectures need to improve students’ thinking skills at a higher level as well as their discipline, not only that, students must also master the skills to implement their knowledge, such as when working in groups each student must understand their respective responsibilities and consequences. lecturers in educating are not providing as much information as possible but educating students to master the skills of how to learn. lecturers must also be able to guide students over misunderstandings about how the world works, current lectures require an environment that fosters creativity, involves the latest technology and is based on collaboration.[1].

In this century, students must be skilled in learning, students must be able to think critically, namely thinking clearly and rationally to determine what to do and what to believe, to be critical thinking students should be able to understand the relationship between logic and ideas so that they can form an argument and can build ideas as a solution to a problem accompanied by logical considerations and values. In critical thinking skills and abilities of reason assessment are needed [2]. Critical thinking skills must of course be supported by creativity, this ability supports students to create with innovation. collaboration in facing challenges is the key to accelerating in developing ideas, creating solutions, developing a prototype, etc. creativity will produce progress in the future and will indirectly provide progress at the level of creativity itself, but in the future creativity is faced with a direction of development that needs to be questioned about its values and responsibilities [3].
The ability to collaborate must also be balanced with the ability to communicate so that an effective exchange of information can occur, communication is the key to success in creating a positive environment in learning so that learning success is influenced by communication [4]. Learning skills (Critical thinking, Creativity, Collaboration, and Communication) or often also called “the four C’s”. In addition to these skills, students need to improve skills literacy in information, media and technology, literacy is not just an activity of reading, speaking, listening and writing, but in its development literacy is interpreted as a deep understanding of information, media, technology, literacy is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts [5].

Information literacy is concerned with finding and using information in everyday life. Media literacy is related to the ability to access, analyze, evaluate and communicate information in various forms of media, and Technological literacy is the ability and skill to use, manage, assess and understand technology. Literacy and learning skills must be developed by universities with lectures, these skills are even better if they are equipped with life skills such as flexibility, leadership, initiative, productivity, and social skills. Learning skills, literacy skills and life skills are called 21st century skills, the changing world which is increasingly modern provides challenges for education so that adaptation is needed, but the most important part in adapting is knowing the purpose of adaptation, not just following what is the current world trend [6].

Lectures in early childhood education study programs, Unimed apply the KKNI curriculum (Indonesian National Qualification Framework), KKNI is a statement of the quality of Indonesian Human Resources whose qualifications are based on the level of ability stated in the formulation of learning outcomes [7].

This curriculum is implemented through blended learning methods and flipped classrooms as an effort to provide a better learning experience than before, this curriculum also assigns students with six types of assignments, namely routine assignments, critical book reports, critical journal reviews, idea engineering, projects and mini research. In improving the quality of curriculum implementation, the team project-based lecture method and the case method are implemented. Team based project is a lecture method that gives assignments to students in groups to carry out a project, and the case method is a lecture method that seeks to present cases that occur in everyday life as topics of discussion in lectures.

In addition, the MBKM program also provides experiences for students to study outside campus through student programs and activities so that students are able to apply skills from campus to the community and gain new experiences from their implementation. These methods, programs and curriculum are efforts made to improve students' 21st century skills, and the form of implementation of methods, programs and curriculum needs to be well designed into the lecture model.

2 Method

This research was carried out by applying the research and development (RnD) method by Borg and Gall [8] which seeks to create or develop a product, namely the 21st century lecture model, in the implementation of this research through (1) potential and problem analysis to find out the supporting factors of the research as well as the things that can be an obstacle to the research, (2) data collection as a reference in developing products, (3) product design and (4) design validation by expert, the research stopped at the fourth stage due to the unsupportive covid 19 pandemic situation, to continue product trials, research will be continued in 2022 to improve product quality through product trials and implementation tests, where lectures with
the new normal begin. this research was conducted at the early childhood education study program, Unimed in June – August 2021, data collection was carried out by literature studies and interviews and then analyzed descriptively qualitatively.

### 3 Result and Discussion

This research begins with an analysis of potential and problems, this research supports potential such as the implementation of the KKNI which is not new so that the understanding of researchers, lecturers, and students is the same, besides that campus policies to implement and improve the quality of their implementation are supporting factors for the development of lecture models, factors.

![Fig 1. 21st Century Lecture Model Flowchart](image)

Another supporter is the presence of expert curriculum developers so that the direction of development is better, but besides that, an inhibiting factor is found, namely the Covid -19 pandemic situation which limits it to gathering students to carry out product trials so that development can only be carried out on a limited basis and only reaches the design validation stage by experts. in the next stage the researchers collected data related to the development of the KKNI curriculum so that the method of implementing blended learning and flipped learning as well as six tasks was obtained, besides that data related to the team base project and case method were needed as a basis for developing lecture models, information about the concept of 21st century skills, learning programs outside campus and student center learning are needed so that these components become the hallmark of this model.
At the next stage the development of the lecture model is continued by compiling product designs by taking into account the week of lectures, curriculum, campus policies and other things, the lecture model can be described as Fig 1.

From the picture above, it can be seen that the 16-week course maximizes mastery of 21st century skills by taking into account the needs and learning outcomes, the stages in the implementation of the lecture model are.

a. The first week begins with preparation by explaining lecture contracts, schedules, applications, systems, media, assignments and evaluations to students, at this stage students have begun to develop the form of learning activities and projects that will be carried out.

b. Week 2-7 to master the basic material where in this week the material that uses the flipped classroom method students learn earlier the material to be discussed in class, it is better to provide digital-based material to develop learning materials where in addition the application of the case method requires preparation of cases that will be used in lectures. this week students have mastered the basic skills of the courses so that they can be used as the basis for carrying out projects.

c. Week 8 midterm exam is conducted to measure the basic skills of the subject, preferably using an application that is able to support the improvement process (formative) and is based on mastering several 21st century skills

d. Week 9 continued with project preparation, this week lecturers and students agreed on the project, schedule and implementation procedures, the project was carried out in groups.

e. Week 10-12 is carried out using the blended learning method where at this time students have carried out their project activities and are supervised by lecturers through their daily logbook applications, students can conduct learning experience programs outside of campus so that they can apply knowledge on campus to the community

f. Week 13 carried out monitoring and evaluation to see the progress of the projects carried out by students, monitoring and evaluation was carried out through presentations so that it could be seen how far the progress of the project, problems faced, and solutions were taken.

g. Week 14-15 do the finishing project so that the project activities can be completed in its entirety, this week the lectures are carried out with blended learning where groups of students complete their final reports and project outputs.

h. Week 16 the final exam will be conducted through the presentation of student project results.

Through all of the above stages, students are expected to be able to produce publications, student creativity program proposals, learning media, etc. Therefore, lecturers need to prepare the latest learning resources based on research results, and support the implementation of case methods, learning assessments and assessment rubrics based on the achievement of 21st century skills, design assignments and exams, learning management systems and supporting applications and this model is called the "21st century lecture model". This initial design needs to be validated by experts, validation is done through a test using the Aiken V formula, and followed by a reliability test with ICC, the results of the analysis can be seen in the two tables below.

<p>| Table 1. Content Validity Test Results 21st Century Lecture Model Design by Experts |</p>
<table>
<thead>
<tr>
<th>Indicator</th>
<th>V</th>
<th>Criteria</th>
<th>Indicator</th>
<th>V</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1,00</td>
<td>Valid</td>
<td>12</td>
<td>0,92</td>
<td>Valid</td>
</tr>
<tr>
<td>2</td>
<td>0,92</td>
<td>Valid</td>
<td>13</td>
<td>1,00</td>
<td>Valid</td>
</tr>
<tr>
<td>3</td>
<td>1,00</td>
<td>Valid</td>
<td>14</td>
<td>0,92</td>
<td>Valid</td>
</tr>
<tr>
<td>4</td>
<td>1,00</td>
<td>Valid</td>
<td>15</td>
<td>1,00</td>
<td>Valid</td>
</tr>
</tbody>
</table>
5 1,00 Valid  16 1,00 Valid
6 1,00 Valid  17 1,00 Valid
7 1,00 Valid  18 1,00 Valid
8 0,67 Valid  19 0,92 Valid
9 1,00 Valid  20 1,00 Valid
10 1,00 Valid  21 0,92 Valid
11 0,67 Valid

Table 2. Results of Expert Test ICC Analysis

<table>
<thead>
<tr>
<th></th>
<th>Intracl</th>
<th>95% Confidence Interval</th>
<th>F Test with True Value 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correlationb</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
</tr>
<tr>
<td>Single Measures</td>
<td>.571a</td>
<td>.361</td>
<td>.766</td>
</tr>
<tr>
<td>Average Measures</td>
<td>.842c</td>
<td>.693</td>
<td>.929</td>
</tr>
</tbody>
</table>

Based on table 1, it can be seen that the average score for the Aiken v validity test is 0.95, the result is greater than 0.3 so that the content validation can be declared valid, then the ICC reliability test in table 2 is carried out to see the consistency of experts in assessing the 21st century lecture model and obtained a score of 0.571, the score is higher than 0.5 so it can be stated that there is a common perception in providing an assessment.

4 Conclusion

The conclusions of this study are found a valid 21st century lecture model, by implementing blended learning, flipped classroom, six types of assignments using the team-based project and case method, as well as an off-campus learning experience program, so it can be suggested to continue the development of the model so that later it can be mass produced and implemented in lectures.

References

Development of Electronic Student Worksheet Problem Based Learning Model Based on Articulate Storyline Application in Class IV SD Negeri 043935 Simpang Katepul School Year 2020/2021

Yusra Nasution1, Risma Sitohang2, Fajar Sidik Siregar3, Arwedy Adeja Barus4 {yusranasution@unimed.ac.id1, rismasitohang@gmail.com2, fajar.sidik@unimed.ac.id3, arwedy.barus@gmail.com4}

Elementary School Teacher Education, Universitas Negeri Medan, North Sumatera, Indonesia1234

Abstract. The problem in this research is the unavailability of Electronic Student Worksheet that is able to attract the learning interest of fourth grade elementary school students. The purpose of this study was to determine the development process, feasibility and effectiveness of the Electronic Student Worksheet Problem Based Learning Model Based on the Articulate Storyline Application which was developed on Theme 6 Ideals - My Goals, Sub-theme 1 I and My Dreams, learning 1 Class IV SD Negeri 043935 Simpang Katepul School Year 2020/2021, based on the Expert (Validator) and product trial results. This research is development research (R&D) using the Borg and Gall model. The steps in this study are limited to 6 stages, namely: 1) Potential and Problems, 2) Data Collection, 3) Product Design, 4) Design Validation, 5) Design Revision, 6) Product Trial. Validation was carried out by material experts, design experts, educational practitioners and field trials. Based on the results of the validation of the Electronic Student Worksheet seen in the assessment of material experts, media experts and educational practitioner experts, the feasibility percentages were 94.2%, 80% and 75%, respectively. So the Electronic Student Worksheet developed was feasible to be tested. Based on the results of product testing, it can be seen that the value of students before using the Electronic Student Worksheet Problem Based Learning Model Based on the Articulate Storyline Application was 54.3% and after using the Electronic Student Worksheet Problem Based Learning Model Based on the Articulate Storyline Application was 77.6%. The results of students' answers in using the product have an average value above the minimum completeness criteria, which is 70, so it can be categorized as "Very Good". So it can be said that the Electronic Student Worksheet Model Problem Based Learning Based on Articulate Storyline Applications is effectively used in the fourth grade of elementary school. Based on the results of the description above, it can be concluded that the Electronic Student Worksheet Model Problem Based Learning Based on the Articulate Storyline Application which was developed on Theme 6 : My Dreams, Sub-theme 1 : Me and My Dreams, First Learning is suitable for use in the learning process of fourth grade students of SD Negeri 043935 Simpang Katepul School Year 2020/2021.

Keywords: Electronic Student Worksheet, Problem Based Learning
1 Introduction

In this day and age, technological developments have an impact on various fields, especially in the field of education. The development of technology is something that cannot be avoided anymore, because the development of technology will run in accordance with the progress of science. Through the use of technology in the field of education, it can have a good impact such as making it easier for students to understand the material presented by the teacher, the number of learning resources that students can use and the learning process more enjoyable.

Learning is a process of conveying thoughts by teachers to students, it can be said that it is a combination of teaching in the context of teachers and learning in the context of students. According to Priansa [1] learning is essentially a process of interaction between teachers and students, and the environment around them, in which there are efforts to improve the quality of students themselves to be better than before. In the current condition, learning is strongly influenced by the development of technological results that can be used as learning needs. Learners are positioned as learning subjects who plays a major role so that students are required to be fully active in learning learning materials.

Development technology require the teacher Keep going create new innovations so that the learning process runs effectively, namely by utilizing technology in making learning tools including the learning implementation plan (RPP). RPP has several components and specifications, one of the elements contained in the RPP is a learning resource. Learning resources can be in the form of student worksheets. The student worksheet is a device that can facilitate teaching and learning activities so as to form an effective interaction between students and teachers.

Innovation in utilization the technology in the learning device is an electronic student worksheet. Electronic student worksheet is a student worksheet that can display simulations by combining video, images, animation, text and navigation so that learning is more interesting and fun. The existence of innovative and creative electronic student worksheet will make students curious about the contents of each the page. so that students will be addicted to learning.

In accordance with research conducted by Hidayah in 2020, it is necessary to develop teaching materials in the form of electronic student worksheet. Overall, students gave the opinion that the electronic student worksheet developed was interesting and easier to learn. Students also provide suggestions for more similar electronic student worksheet developments so that online learning can be more effective and increase students' enthusiasm for learning.

Based on an initial interview on February 1, 2021, with a fourth grade teacher at SD Negeri 043935 Simpang Katepul, the existing Student Worksheets still tend to contain only questions. Student Worksheet does not yet have interesting pictures and steps in working on assignments, so students cannot find meaningful learning experiences. The learning model in the student worksheet also has not applied the model Problem Based Learning (PBL). Model Problem Based Learning (PBL) is learning which using real (authentic) problems that are open so that students can develop new knowledge and think critically.

Based on the initial observation of the results of the daily test on Theme 6 My Dreams, Sub-theme 1 Me and my Dreams that student learning outcomes are still low can be seen from the following table.
Table 1. Students' Daily Test Values Class IV Sub-theme 1 Me and My Dreams SD Negeri 043935 Simpang Katepul

<table>
<thead>
<tr>
<th>Minimum Completeness Criteria</th>
<th>Score</th>
<th>Student</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;70</td>
<td>16</td>
<td>53.3%</td>
<td></td>
</tr>
<tr>
<td>&gt;70</td>
<td>14</td>
<td>46.7%</td>
<td></td>
</tr>
<tr>
<td>Amount</td>
<td>30</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Based on the table above, it is known that the minimum completeness criteria value at SD Negeri 043935 Simpang Katepul in class IV is 70. With students who do not reach the minimum completeness criteria as many as 53.3%, while students who achieve the minimum completeness criteria are 46.7%. So it can be concluded that student learning outcomes in Sub-theme 1 me and my dreams are still low. The low student learning outcomes can occur because students do not understand the material taught by the teacher.

Online learning is also one of the factors for low student learning outcomes. This is in accordance with the researcher's initial observation that teachers still use student worksheets which only contains questions and does not have interesting pictures. So that students find it difficult to understand learning.

2 Method

The research was conducted at SD Negeri 043935 Simpang Katepul, Jalan Katepul No. 42b, Kabupaten District, Karo Regency, North Sumatra Province. Time The research was carried out in the second semester of the 2020/2021 academic year. Class IV SD Negeri 043935 Simpang Katepul totaling 30 students. With the number of male students 17 people and the number of female students is 13 people. Due to the current state of the Covid-19 pandemic, the subject of this study is limited to 15 students in order to comply with the applicable health protocols. This type of research is development research. The research method used is the method Research and Development (R&D).

Borg and Gall (Sugiyono [2]) say that (R&D) is a research method used to develop or validate products used in education or learning. The product to be developed is the Electronic Model Student Worksheet. Problem Based Learning Application Based Articulate Storyline and test the eligibility of the electronic student worksheet. In general (R&D) is longitudinal (some steps). For needs analysis research so as to be able to produce a product, namely the electronic student worksheet Model Problem Based Learning. Furthermore, to test the feasibility of the product that has been made, it is carried out action research. After the product testing process it can be published.

Step by step study and development (R&D) referred to from Borg and Gall (Sugiyono) there are 10 stages, namely: 1) Potential and problems, 2) Data collection, 3) Product design, 4) Design validation, 5) Design revision, 6) Product trial, 7) Product revision, 8) Usage trial, 9) Product revision, 10) Mass production.

The data collection techniques used are as follows:

a. Interview There are several techniques in data collection including interviews
   According to Sugiyono as a data collection technique if the researcher wants to conduct a preliminary study to find problems that must be investigated, and also if the researcher wants to know things from respondents who are more in-depth, and the number of respondents is small. In this study, researchers conducted interviews with fourth grade teachers at SD Negeri 043935...
Simpang Katepul. The aim of the researcher was to conduct interviews with fourth grade teachers to find out the learning process and the use of teaching materials in this case the student worksheet used by classroom teachers. In the interview, the researcher also tried to find out the characteristics of the students in order to create an electronic student worksheet that was in accordance with the characteristics of students in class IV at SD Negeri 043935 Simpang Katepul.

b. Questionnaire according to Sugiyono

Questionnaire is a data collection technique that is done by giving a set of questions or written statements to respondents to answer. Questionnaires are given to determine the needs of teachers and students on student worksheet. Also, a questionnaire will be used to determine the quality of the material that has been developed in the electronic student worksheet. With this questionnaire, researchers can get input so that they can according to Interview Sugiyono used revise the electronic student worksheet product that has been made.

c. Test

In this research will be carried out pretest and posttest which aims to measure student achievement before and after the use of the developed electronic student worksheet.

The type of test that will be used is multiple choice. The test will be used by researchers for additional information in revising the electronic student worksheet. On pretest will be given to students before using the electronic student worksheet. Whereas posttest will be given to students after using the electronic student worksheet.

The data analysis technique used in this research is in the form of quantitative data analysis and qualitative data analysis. Qualitative data analysis is data obtained from interviews, as well as validator comments from the questionnaire given. Meanwhile, quantitative data analysis is data obtained from research results using a scoring scale. The data analyzed were in the form of feasibility instrument data from material experts, design experts, education practitioners and test experts.

The technique used to analyze the validation results of the electronic student worksheet is quantitative data analysis by looking at the results of the validator questionnaire data analysis. The results of the electronic student worksheet validation data score calculated based on the Likert scale (score criteria 1 to 4) can be seen in table 2.1 below:

<p>| Item Answer Criteria Validation Instrument | Score |</p>
<table>
<thead>
<tr>
<th>No</th>
<th>Answer</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Worthy</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Worthy</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Decent Enough</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Less Worthy</td>
<td>1</td>
</tr>
</tbody>
</table>

To increase effectiveness in data collection. First, the test instrument test results are carried out to know the validity of the test. According to Sugiyono, the research results are valid if there are similarities between the data collected and the data that actually occurs in the object under study.

### 3 Result and Discussion

This study uses development research (Research and Development) and the development model used is the Borg and Gall model in Sugiyono. The results of the development carried out are the electronic student worksheet Model Problem Based Learning Application Based Articulate Storyline on Theme 6 My Dreams, Sub-theme 1 Me and My Dreams, Learning 1 Class IV SD Negeri 043935 Simpang Katepul FY 2020/2021.
In this study, the researcher limits the steps of developing the Borg and Gall model in Sugiyono into 6 steps, namely: 1) Potential and Problems, 2) Data Collection, 3) Product Design, 4) Design Validation, 5) Design Revision, 6) Trial Product. At this stage the researchers looked for potentials and problems that occurred in SD Negeri 043935 Simpang Katepul related to the use of student worksheet in the learning process. At this stage the researchers conducted initial observations by interviewing fourth grade teachers at SD Negeri 043935 Simpang Katepul about the learning process.

Based on these initial observations, researchers found the potential that students had resources in the form of: WL android that can be used in the learning process and the problems found are related to student worksheet in learning, where student worksheet is less innovative, so it is necessary to develop student worksheet used by teachers as teaching materials. So that students find a meaningful learning experience. After finding the potential and problems that exist in the next SD researcher collect information that will used to take advantage of existing potential and overcome problems related to student worksheet in the learning process.

At this stage the researcher collects relevant theories for the student worksheet product to be developed, the technology used in making electronic student worksheet, determine material learning that will be used, interesting learning resources and making lesson plans. After gathering the required information. Next, make the initial product with the design you want to make. Products designed using various sources of books and other sources. The steps are: 1) Determining basic competencies and indicators, 2) Compiling the contents of the electronic student worksheet material, 3) Loading pictures and illustrations that match the content of the material and attract students' interest in learning, 4) making interesting activity sheets.

At the stage of compiling materials and activity sheets adjusted to the level of development of students, namely grade IV SD. The material is taken from Indonesian subjects, namely the Characteristics of Poetry and Poetry Content, Science, namely the Cycle of Living Things. The material designed is adapted to the environment around students to make it easier to understand the learning material.

Validation test assessment Electronics student worksheet for educational practitioners will be held on May 7, 2021. As for the validators for educational practitioner’s electronic student worksheet is a fourth-grade teacher at SD Negeri 043935 Simpang Katepul, namely Mr. Edi Suranta Singarimbun, S.Pd. Aspects that are validated are aspects of material content, aspects of material presentation, technological aspects and language aspects.

The results of the expert validation of education practitioners can be seen as follows: 1) The aspect of material content gets a score of 12 out of a maximum score of 16, with an eligibility percentage of 75%. 2) The material presentation aspect got a score of 11 out of a maximum score of 12, with a feasibility percentage of 91.6%. 3) The technology aspect got a score of 6 out of a maximum score of 8, with a feasibility percentage of 75%. 4) The language aspect got a score of 10 out of a maximum score of 12, with an eligibility percentage of 83.3%. Based on the scores of the four aspects, a total score of 36 was obtained from a maximum score of 48, with a feasibility percentage of 75% and included the criteria for testing without revision.

Based on the assessment by experts, it can be seen that the percentage of material experts before the revision was 86.5% and after the revision was 94.2%. Design experts have a percentage of 68.3% before the revision and 80% after the revision. In expert education practitioners have a percentage of 75% without revision. Based on this information, the results after the revision of the electronic student worksheet are feasible to be tested. The following is a tabulation diagram of the expert validation results on the Electronic Student Worksheet.
Conclusion

The research conducted is research on the development of the electronic student worksheet model Problem Based Learning Application Based Articulate Storyline on Theme 6 My Dreams, Sub-theme 1 Me and My Dreams, learning 1, with content, namely material and activity sheets equipped with pictures and videos. So that students feel interested and easier to understand the material presented in the electronic student worksheet. Based on the results of the feasibility analysis which is known through the validation stage of material experts, design experts and educational practitioners, the percentage scores are 94.2%, 80% and 75%. The average obtained from the results of the validation of experts is 83.06% with the "Very Eligible" criteria. From the three experts, it is known that the material and design criteria are feasible used in the learning process, especially in Theme 6 of My Dreams, Sub-theme 1 of Me and My Dreams, Learning 1.

Based on the results of the analysis of the effectiveness of the electronic student worksheet conducted through product trials, it shows that the value of students before using the electronic student worksheet Model Problem Based Learning Application Based Articulate Storyline by 54.3% and after using the electronic student worksheet Model Problem Based Learning Application Based Articulate Storyline to 77.6%. The results of students' answers in using the product have an average value above the minimum completeness criteria, which is 70, so it can be categorized as "Very Good". Based on the information above, it can be said that the electronic student worksheet Model Problem Based Learning Application Based Articulate Storyline effectively used in grade IV SD.

References

The Analysis of STEM Career Interest of Students Aged 13-15 as an Overview for The Development of STEM Career Counseling

Mohamad Nurfajar Sidiq1, Anna Permanasari12, Riandi13

{mohamad.nur@upi.edu}

Pendidikan IPA, Sekolah Pascasarjana, Universitas Pendidikan Indonesia, Bandung-Indonesia1, Departemen Pendidikan Kimia, FPMIPA, Universitas Pendidikan Indonesia, Bandung-Indonesia2, Departemen Pendidikan Biologi, FPMIPA, Universitas Pendidikan Indonesia, Bandung-Indonesia3

Abstract. This study aims to provide an overview of the career interests profile of students aged 13-15 years in the fields of Science, Technology, Engineering, and Mathematics (STEM) in Indonesia. This study used a descriptive survey research design. The data is collected by using the STEM-Career Interest Survey (STEM-CIS). The survey sample consisted of 263 random online surveys using Google Forms. Analysis of the average student STEM-CIS data per question item was carried out to describe each aspect of social-cognitive career theory (SCCT). Based on the results of STEM-CIS, the average value of students' STEM career interests in the science field is 3.37, the technology field is 3.57, the engineering field is 2.95 and the mathematics field is 3.42. The implication of this research is to provide suggestions for suitable and more effective career counseling programs to increase students' interest in STEM careers.

Keywords: STEM-CIS, social-cognitive career theory, STEM career, career counseling

1 Introduction

Career is one of the major factors to people for taking path for their education journey. It is often becoming a main reason for one career development and choices. To be clear, given its importance, career development and interest should be introduced from the early phases of one’s education as the part of long journey of their career development and starting with their own beliefs, interest and goals to further influence one’s academic path [1]. Career on STEM (Science, Technology, Engineering, Mathematics) put its own issue for majority of students in Indonesia, since its implementation on Indonesia’s Education.

However, the demand of STEM graduates has been increasing, especially in Indonesia. Those demand must be answered by the supply of graduates to increase Indonesia’s chances to global competitive opportunity to face Industry 4.0. Therefore, students must have the information they might need such as career opportunity and academic path in order to meet one’s goal to develop career in STEM disciplines.

School, in this case, has a role to nurture students career development and interest in STEM disciplines. One of the duties of a school counselor is to provide career counseling services to students. Of course, this is very important to maintain students' motivation in learning, especially in STEM material because of the difficulty level in STEM learning [2]. Li et. al. [3] stated, although students' STEM career interests are influenced by many things, school
counselors can improve students' STEM career development by providing services that focus on improving students' self-efficacy and outcome expectations. Of course, the consultation provided by the BK teacher must be based on the right data and information. To make this easier, BK teachers must understand and understand the profile of students' interests in careers in the STEM field.

The STEM Career Interest Survey instrument [4] is based on the social-cognitive career theory (SCCT) by Lent [5]. Kier et al. [4] describes the aspects of SCCT that are measured using STEM-CIS are self-efficacy, personal goals, outcome expectations, interests, personal inputs and contextual supports. The purpose of this study is to provide an overview of students' STEM career interests based on aspects of SCCT using the STEM-CIS instrument. The SCCT aspect is analyzed per question item as information that can be used by school counselors in providing guidance to develop students' STEM career interests. Some suggested activities are also given as consideration in student career counseling activities.

2 Research Method

The design of this study used a descriptive survey method. The survey data was taken from an online survey using a Google Form link distributed through social networks and chat applications. The sample consisted of 263 students aged 13-15 years from various schools in Indonesia. Data collection was carried out on November 15 to December 1, 2021. The survey instrument used was the Indonesian translation of the Science, Technology, Engineering and Mathematics Career Interest Survey (STEM-CIS) by Kier [4] using the back translation method. The validity of the Indonesian translation instrument ranges from 0.244 to 0.645 (rtable = 0.2352). The reliability of the Indonesian translation instrument has a Cronbach Alpha between 0.852 – 0.911.

The instrument consists of 44 question items which are divided into 4 areas of study. Each field of study consists of 11 question items. The sample was asked to answer each question by choosing among 5 answer options: Disagree (1), Slightly Disagree (2), Neutral (3), Agree (4), Strongly Agree (5). The average of the sample answers is used to describe the level of students' interest in STEM careers. Analysis of each question item based on social-cognitive career theory (SCCT) was carried out to see the causes of students' high and low interest in STEM careers. Recommendations for career counseling activities are given to counselors based on the results of the analysis.

3 Result and Discussion

The survey results using STEM-CIS are divided into 4 fields of study: science, engineering, technology and mathematics. Each field consists of 11 question items. The average for each field is illustrated by the diagram below.
Based on the diagram above, it can be seen that the average for each field is quite low. In comparison, the level of interest in STEM careers for pre-service teachers in Indonesia using the STEM-CIS instrument has an average of 3.80 in the field of science and 4.08 in the field of technology [6]. Using the STEM-CIS instrument, researchers can measure several aspects of SCCT. Among them are self-efficacy, personal goals, outcome expectations, interests, contextual supports, and personal inputs. The six aspects of SCCT are divided into four categories of fields of study, namely Science, Technology, Engineering, and Mathematics. The following is a student’s SCCT aspect average score based on the STEM Career Interest Survey in each field of study.

### Table 1. Average data of student’s SCCT Aspects based on STEM-CIS

<table>
<thead>
<tr>
<th>SCCT Aspects</th>
<th>Item No.</th>
<th>N</th>
<th>Science</th>
<th>Technology</th>
<th>Engineering</th>
<th>Mathematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy</td>
<td>1</td>
<td>263</td>
<td>3.30</td>
<td>3.62</td>
<td>2.98</td>
<td>3.48</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>263</td>
<td>3.69</td>
<td>3.73</td>
<td>2.99</td>
<td>3.75</td>
</tr>
<tr>
<td>Personal Goals</td>
<td>3</td>
<td>263</td>
<td>3.32</td>
<td>3.66</td>
<td>2.94</td>
<td>3.35</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>263</td>
<td>3.71</td>
<td>3.86</td>
<td>3.09</td>
<td>3.96</td>
</tr>
<tr>
<td>Outcome Expectations</td>
<td>5</td>
<td>263</td>
<td>3.71</td>
<td>3.86</td>
<td>3.14</td>
<td>3.68</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>263</td>
<td>3.58</td>
<td>3.45</td>
<td>3.08</td>
<td>3.54</td>
</tr>
<tr>
<td>Interest</td>
<td>7</td>
<td>263</td>
<td>3.22</td>
<td>3.84</td>
<td>2.84</td>
<td>3.08</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>263</td>
<td>3.40</td>
<td>3.46</td>
<td>2.97</td>
<td>3.39</td>
</tr>
<tr>
<td>Contextual Support</td>
<td>9</td>
<td>263</td>
<td>2.83</td>
<td>3.04</td>
<td>2.62</td>
<td>2.94</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>263</td>
<td>3.17</td>
<td>3.37</td>
<td>2.79</td>
<td>3.27</td>
</tr>
</tbody>
</table>

### 3.1 Analysis of SCCT Aspects

#### Self-Efficacy

In the field of science, the average value of self-efficacy for the 2 question items is 3.30 and 3.69. This shows that the average student has the confidence to get good grades in science class.
In addition, the question item number 2, namely "I am able to complete my science homework" has a greater average than the question item number 1. This illustrates that students are more confident in doing their homework than getting good grades in science class. In the field of technology, the average value of student self-efficacy is quite high, namely 3.62 for question item number 1 and 3.73 for question item number 2. This number shows that students have high self-efficacy in carrying out activities involving technology. In addition, the question on item number 2 in the field of technology, "I am able to learn new technologies" shows that students also do not have significant obstacles in learning new technologies.

In the engineering field, the average self-efficacy of students is the lowest among the four other fields of study. The average self-efficacy of students in the engineering field is 2.98 for question item number 1 and 2.99 for question item number 2. This may be because students do not fully understand the form of activities that involve engineering. This was revealed in an interview session with 10 randomly selected students. 7 out of 10 students stated that they did not understand engineering activities, so they were not confident in answering that they were able to carry out engineering-related activities.

In the field of mathematics, the highest average student self-efficacy in item number 2 is 3.75. Question item number 2, “I am able to complete my math homework” revealed that students were more confident in doing their math homework compared to getting good grades in math class. The self-efficacy of students is very important to determine the level of interest of these students in taking a career in the STEM field. In the social-cognitive theory by Bandura [6], self-efficacy greatly affects a person's interest in doing an activity. The higher a person's self-efficacy, the more confident that person can master a field in his life. Through activities related to STEM, it is hoped that someone can increase interest in a career in the STEM field. Bandura [7] explains that in addition to self-efficacy can affect behavior and the environment, self-efficacy can also be influenced by these two things. This means that self-efficacy can be an input for behavior and the environment, but it can also be an output due to the influence of behavior and the environment.

**Personal Goal**

Based on table 1, it can be seen that the average of personal goals in the field of science is quite high. Question item number 3 and question item number 4 in the field of science which measures personal goals gets an average 3.32 and 3.71. If we compare the averages for items number 3 and 4, it can be seen that the tendency of students is more to try hard in science class than to plan to use science in their future careers. It can be said that many students do not plan to pursue a career in science. Through further investigations to find out why students do not plan to use science for their future careers, it was found that most of the reasons are because work in science is very difficult and complicated. So, they put aside suggestions to pursue a career in the STEM field in the future.

In the field of technology, question item number 3 got an average of 3.66. This figure shows that many students are aware of the use of technology to help their career in the future. While the question item number 4 got a higher average of 3.86. This means that students tend to learn to use technology to help them achieve success in school. From these two things, it can be concluded that more students are not future-oriented. Lent et al. [5] states that career goals are often perceived as ideals and dreams when measured long before they actually start a career, so they have no real consequences or require commitment. For example, during elementary school, students' ideals can still change. When compared to when students enter high school, students' goals usually tend to focus on only one area.

In the field of engineering, question item number 3 got an average of 2.94, the lowest compared to other fields. While the question item number 4 also gets the lowest average
compared to other fields, which is 3.09. These two question items indicate that students do not yet understand the usefulness of engineering for their future careers, but they are aware that school activities that use engineering can help them. Research by Sari, Şen, and Alci [8] which shows that at the time of the pretest, jobs in the engineering field were the least chosen by students compared to other fields. Researchers suspect the low average personal goal in engineering is because there are still many students who do not understand about activities or careers that use engineering.

In the field of mathematics, question item number 3 gets an average of 3.35. This confirms that students still do not know whether the field of study will really be useful for their future careers. While the question item number 4 got the highest average of 3.96. This further strengthens the notion that students are still oriented towards current activities rather than future plans.

**Outcome Expectation**

Outcome expectations according to Lent et al. [5], are described as the expected consequences of doing certain activities, for example, "when I do this, what will happen?". Meanwhile, Bandura [6] divides outcome expectations into several categories that can influence behavior in choosing a career, such as the anticipation of physical (e.g. financial), social (e.g. approval) and self-evaluative (e.g. self-statistical). Mitchell and Krumboltz in Lent (1994) state that career counseling methods that focus on the consequences of decisions from several choices also implicitly justify the importance of outcome expectations.

In the field of science, question item number 5 gets a fairly high average of 3.71. This figure shows that students realize the importance of studying science well in class for their future career needs. In addition, question item number 6 in the field of science got an average of 3.58. It also shows that many students perceive their parents' expectations for them to take up a career in science.

In the field of technology, statement item number 5 gets the highest average compared to other fields, which is 3.86. Based on the statement items, most students think that studying technology will open up their opportunities to get jobs and wider career prospects. While the question item number 6 gets an average of 3.45. This shows that students are more likely to think that learning technology will be useful in the future compared to today.

In the field of engineering, question item number 5 and question item number 6 get the lowest average among other fields. Even so, among all of the questions in the engineering field, the questions that measure outcome expectations get the highest average compared to other question items. Researchers suspect this is because students actually know several types of work in the engineering field but are not familiar with the skills needed to work in this field.

In mathematics, the average of question number 5 is 3.60 and question item number 6 is 3.41. Students understand that mathematics can help their careers in the future, but there are still many students who do not know the type of work in mathematics. Based on the results of the interviews, some students did not seem to know that a job such as an accountant is a type of job that belongs to the field of mathematics. Even though they mentioned that one of the jobs that their parents liked was accountant.

**Interest**

Interest in the STEM field is divided into two types, namely vocational interest and occupational interest. Vocational interest describes how students are interested in learning knowledge from a field of study. While occupational interest describes how students are interested in doing work in a particular field.

In the field of science, question item number 7 gets an average of 3.22. While the question item number 8 average is 3.40. This difference in mean indicates that students enjoy learning
some students revealed through interviews that a job in science would be very difficult to achieve.

In the field of technology, question item number 7 has an average of 3.84. And question item number 8 has an average of 3.46. These two question items get the highest average compared to other fields. This shows that students are more interested in learning and using technology in particular to help them in classroom activities, but not very interested in pursuing a career in technology. Even so, the average number of students who are interested in work in technology is still higher than in other fields.

In the field of engineering, question item number 7 has an average of 2.84, and question item number 8 has an average of 2.97. In contrast to the technology field, in the engineering field, questions 7 and 8 received the lowest average among other fields. Researchers suspect that the low average is caused by the factor of students' lack of knowledge about engineering activities and types of work in the engineering field.

In the field of mathematics, question item number 7 and question item number 8 received an average of 3.08 and 3.39, respectively. Apart from being difficult for students to work in the field of mathematics, the types of work in mathematics are also not widely known by students. This is what causes students to have less interest in work in the field of mathematics.

**Contextual Support**

In the field of science, question item number 9 "I have a role model in a science career" and question item number 11 "I know of someone in my family who uses science in their career get the lowest average among other SCCT aspects. The average for question item number 9 is 2.83 and for question item number 11 is 3.17. Based on the two question items, it can be concluded that there are still many students who do not have role models in science work. This can be overcome by implementing a counseling program involving people who work in science to inspire students in schools.

In the field of technology, the average question item number 9 has an average of 3.04. While the question item number 11 is 3.37. Based on this average, it can be said that many students also do not have role models in the field of technology work. Even so, many of them know that there are family members who work in the technology sector and do not choose to use their family members as role models.

The average question item in the engineering field, namely number 9 is 2.62. As for the question item number 11, the average is 2.79. Question item number and question item number 11 has the lowest average among all fields. Among SCCT aspects, the average for contextual support in engineering is also the lowest. This is because many students do not understand the types of engineering activities and careers in engineering. So students have difficulty determining whether any of their family members are engineers. In addition, due to limited knowledge in engineering, students also have difficulty finding role models who work in this field.

In mathematics, question item number 9 has an average of 2.86, while question item number 11 has an average of 3.15. Based on the average results, it is clear that many students cannot determine whether someone has a career in mathematics. However, students know that some of their family members have careers that use mathematics in their work. These two things are because students' knowledge about the types of careers in mathematics is very minimal.

**Personal Input**

Personal input by Lent et al. [5] is heritable attribute factors such as gender, race/ethnicity, socio-economic status, and physical condition. These factors affect a person's level of self-confidence and self-efficacy. Kier et al [4] uses question items such as "I would feel comfortable talking to people who work in science careers" to be able to see how much someone has the
confidence to be engaged in one of the STEM fields. From this, it can be seen that feeling comfortable can describe a person's level of self-efficacy in a field.

In science, the average is 3.18. This figure illustrates that students' self-efficacy regarding the field of science is still lacking. While in the field of technology, although the average is the highest among other fields, namely 3.38, it still shows that students are not comfortable to be involved in a career in technology. The engineering field got the lowest average of 3.06, while mathematics was 3.20. Based on the average of the two fields, it further strengthens that student do not have sufficient self-confidence and self-efficacy to take a career in the STEM field.

3.2 Career Counseling

Efforts to increase student interest in the STEM field are pursued by implementing STEM learning in schools. Research using problem-based learning (PBL) in STEM activity instruction is able to change students' perceptions of careers in the STEM field [8]. The implementation of PBL in the classroom has also been shown to be related to students' interest in STEM careers [9]. The development of mathematical talent in middle school is also positively related to the decision to take a career in the STEM field [10]. But efforts to increase career interest with STEM learning alone are not enough. Further action is needed using career counseling programs for students in schools.

Based on the results of the analysis, it can be concluded that there are several factors that cause students' low interest in careers in the STEM field. Among them are the lack of information and exploration of students about careers that can be pursued in the STEM field, low self-efficacy of students to engage in STEM fields, student orientation which focuses more on current activities than future plans. Lack of external support from educational and family environment also contributes to students' interest in STEM careers. Through a career counseling program that focuses on the above factors, it is hoped that students' interest in STEM careers can be increased. To tackle those problem factors, the following are some recommendations for counselors that can be considered to develop STEM career counseling programs in school.

Career Exploration

To overcome the low interest in career due to lack of information and exploration, career counselors should consider activities in the form of career exploration. Career exploration can be done by inviting figures who work in each STEM field to inspire students, or by increasing the counselor's knowledge about STEM careers. Falco [11] stated that counsellor can provide career experiences by introducing students to STEM role models. The level of student knowledge about a job and career has a close relationship with the intensity of career exploration carried out by students [12]. Rossalina [13] adds that students need to be given assistance not only how to be fluent in studying at school, but also must be given assistance regarding the need for students to explore careers.

According to Schmidt [14], as a student's first gateway before stepping into the world of work, counselors should start to increase awareness of career opportunities in the 21st century, especially in the STEM field. Schmidt then recommends several things counselors can do about this. Among them are, increasing knowledge about the role of school counselors in career exploration activities, increasing knowledge of content and future job opportunities, exploring individual career preferences, and embracing leadership roles in career decision making. Hossain [15] suggested that teachers and counselors in schools learn more about careers in the STEM field in order to provide better advice to students to increase students' interest in STEM careers. Zainudin [16] adds that the counselor acts as someone who is responsible for providing exposure and understanding to students about careers in the STEM field.
Support Services

In addition to increasing the intensity of career exploration in the STEM field, counselors also need to provide career guidance based on individual students. Every student has his own uniqueness. Student self-efficacy is an important factor that can determine student decisions in taking a career in the STEM field. Therefore, school counselors should design career guidance programs that have a positive impact on students' self-efficacy [11]. Falco [11] added, one way that counselors can improve student self-efficacy is to support student achievement, especially in the STEM field.

It is also possible to encourage students to take additional lessons in math and science. Because math and science coursework can be the basis of an educational pathway that can lead students to STEM careers [17]. So counselors need to pay special attention to students who have good achievements in science and mathematics and encourage them to continue to the next level. Improving and maintaining the level of self-efficacy in STEM fields should be the most important factor in providing support services to students.

Collaboration

Increasing students' interest in STEM careers is not just the job of a counselor or teacher. But it involves many parties such as parents, teachers, and counselors who have direct relationships with students to be able to work together. Counselors need to work with science or mathematics teachers in schools to provide counseling programs for student achievement and self-efficacy. Schmidt [14] gave an example that counselors can help teachers provide information to teachers about the subject of interest of students, and identify biases that students have regarding STEM fields. Support from parents can also have a profound effect on students' motivation and expectations to develop careers in the STEM field [18]. Falco [11] added, counselors can provide information and training to parents regarding the importance of prudence when talking about student effort and achievement in the STEM field.

Conclusion

Based on the results of STEM-CIS, the average career interest of STEM students aged 13-15 years is 3.37 for science, 3.57 for technology, 2.95 for engineering and 3.42 for mathematics. The results of the SCCT analysis based on each question item on the STEM-CIS show the factors that cause students' low interest in STEM careers. Among them are the lack of information and exploration of students about careers that can be pursued in the STEM field, low self-efficacy of students to engage in STEM fields, student orientation which focuses more on current activities than future plans, and lack of external support from educational and family environment.

Career counseling programs that focus on overcoming problems based on the causal factors mentioned above are expected to increase students' interest in STEM careers. Career counselors can increase the intensity of students' career exploration, especially in the STEM field. In addition, school counselors need to provide support services that can have a positive impact on student self-efficacy. Furthermore, counselors can work closely with various parties who have direct contact with students to form an environment that motivates students to have a career in the STEM field.
References


The Impact of Technology on Student Achievement in Schools: The Effect of Classroom

Nur Azizah1*, Agusti2, Miftahus Surur3, Dassucik4, Ahmad Hafas Rasyidi5
{nazizah0606@gmail.com}
Information Technology Education, STKIP PGRI Situbondo, Indonesia1, Economic Education, STKIP PGRI Situbondo, Indonesia2345

Abstract. This study emphasizes the use of learning by using classroom has a positive impact can be seen from student learning outcomes which are increasing every day through assignments and quizzes. Students' perceptions of subjects conducted online using the classroom application, namely students feel happy using classroom because it is easy and the teacher/educator is not burdensome by giving a lot of assignments, classroom is flexible, which is easy to access anywhere and anytime, constrained internet access from the absence of a data network or smartphone that is used to support all students for the implementation of e-learning learning. The research method used is the literature study method is a series of activities related to the methods of collecting library data, reading and taking notes, and managing research materials.

Keywords: Classroom, Impact Technology, online learning media.

1 Introduction

In essence, learning is a process to regulate and organize the entire environment around students so that it can grow and encourage students to carry out the learning process. There are two types of learning, namely conventional and online learning[1]. According to Djamarah, conventional learning methods are traditional learning methods or also known as the lecture method, because this method has long been used as an oral communication tool between teachers and students in the learning and learning process. In history learning the conventional method is characterized by lectures accompanied by explanations and division of tasks and exercises.

While online learning is an abbreviation of "in the network" as a substitute for the word online that we often use in relation to internet technology. Along with the development of information and communication technology, a new learning system has emerged, namely online learning. Online learning or online learning is distance learning that uses the internet and several technologies as the media used[2].

To support online learning, a social media platform is needed. Social media is one of the media where users can find information, communicate with each other and make friends online[3]. As is known, there are various types of social media, one of which is Classroom. Classroom enables teaching and learning to be more productive and meaningful by simplifying assignments, increasing collaboration, and fostering communication. Teachers can create classes, assign assignments, send feedback, and see everything in one place[4].
There are quite a number of educational problems in Indonesia, ranging from curriculum, quality, competence, and even leadership competencies, both at the top and bottom levels[5]. Various cases of complaints occurred in the field, both school leaders and educators who regretted the dimensions of leadership such as management, discipline, bureaucracy and administration which were in disarray. Then, no less important, the issue of leadership in schools also plays a role in coloring the face of the implementation of the world of education and widening the gaps and internal conflicts of educators[6].

One solution that can be taken by implementing an online learning system is by utilizing the classroom application. Classroom is a free web service, developed by Google for schools, that aims to simplify, create, distribute, and grade assignments without having to meet face-to-face. The main goal of classroom is to streamline the process of sharing files between teachers and students[7].

There are several requirements that must be met in order to support the teaching and learning process using the classroom application. First, every student and educator is required to have access to a good internet network. Second, the availability of the use of digital-based learning media in every school. Third, educators and students have the ability to use and master, as well as keep abreast of developments in information and communication technology. This application is still rare, not even known by most teachers in Indonesia. This application service is assumed to be an alternative in answering the problems and challenges of learning in the classroom. Such as the limited time available in class, lack of time to discuss in reviewing subject matter, and limited time to correct student assignments[8].

Impact of students learning by using progress technology is very good, because learning to use classroom learning media makes students more enthusiastic in carrying out the learning process, students don't get bored easily and feel more interested. If the teacher carries out the learning process by utilizing current technological advances, students can also more easily understand the learning material. This is done so that online learning using the classroom application can produce effective learning outcomes for students. Through the classroom application, it is assumed that learning objectives will be more easily realized and full of meaning. Therefore, the use of this classroom actually makes it easier for teachers to manage learning and convey information precisely and accurately to students[9].

2 Research Method

The methodology used in this study is a systematic literature review using references. Systematic literature review is the process of identifying, evaluating, and interpreting studies that are relevant to a particular research question, topic, or phenomenon. The steps and stages of the research are as follows:

a. The process of searching for literature relevant to the objectives and research questions was carried out on 3 journal databases and research articles, namely Scopus, ScienceDirect and ResearchGate.

b. After the process of searching and collecting (downloading) journals and articles, the next step is to select literature that fits the criteria. These criteria are:

   a. The object of research is the state, government (central and regional), as well as organizations, institutions and institutions under the government.

   b. The research describes the use of e-government in its implementation and effectiveness.

   c. The research uses international language and is peer-reviewed. After selecting based on the above criteria, it is obtained as much literature as has been used now.
3 Result and Discussion

The success of learning in a course is determined by several aspects including the ability of teachers/educators to design and plan strategies, media, methods and teaching materials in order to achieve an interactive and communicative learning. Research related to the use of the use of classroom has previously existed as discussed in the introduction and the result is classroom. In the current study, the results are not much different because they both use classroom as a means of learning activities. These results were obtained through the process of observation (observation) and interviews with students and literature review.

Definition Of Technology Education

Based on the history of its development, the term educational technology began to be used since 1963, and was officially pledged by the Association of Educational and Communication Technology (AECT) since 1977, although sometimes there is overlapping the use of the term with learning technology. However, these two terms are still used in accordance with the considerations of the users[5]. Finn (1965) revealed that in England and Canada the term educational technology is more commonly used, while in the United States the term learning technology is widely used. But sometimes the two terms are used simultaneously in the same activity. And recently the concept has developed that learning technology is more suitable for use in the context of teaching[10].

Educational technology is now very far developed. With the rapid development of technology, the learning process is faster and more effective. We still remember that getting a book in the form of a book is very difficult, especially in remote places. They can only rely on their teachers as the sole source of material. Unlike now, technological developments have brought many changes to the world of education. Call it technology that plays an important role is internet service. Just type a word related to the information we want to find on a web search engine, then we will quickly get that information[11].

Educational Technology is a complex integrated process that includes people, procedures, ideas, tools and organizations to analyze problems and design, implement, assess and manage problem solving in all aspects of human learning. The formal object of educational technology is solving human learning problems. This is done by analyzing the problem first, then implementing, assessing and managing the solution to the problem [12]. The main purpose of learning technology is to solve problems in learning or facilitate learning to improve the resulting performance.

Classroom

Classroom enables teaching and learning to be more productive and meaningful by simplifying assignments, increasing collaboration, and fostering communication. Teachers can create classes, assign assignments, send feedback, and see everything in one place. Schools and nonprofits get Classroom as a core service of G Suite for Education and G Suite for Nonprofits for free. Anyone with a personal Google account can also use Classroom for free[13].

Classroom Function

Classroom is a free web-based tool developed by Google. It was introduced on August 12 in 2014. This app is used by teachers and students, to share files between them[14]. In Classroom, teachers can create assignments for students, and can also collect assignments from them. Both teachers and students can work paperless in this application. Here are some things you can do while studying online with Classroom:

a. Sharing course material/syllabus
b. Assign/submit assignments
c. Hold an interactive Q&A exam/quiz
d. View upcoming tasks via Google Calendar

In addition to the various benefits above, Classroom is suitable as an option for online learning because this platform is free, can be reached by anyone who uses a smartphone, and is relatively safe.

Classroom Features

Classroom can be set up easily. Teachers can set up classes and invite students and teaching assistants. On the Classwork page, they can share information—assignments, questions, and materials. With Classroom, teachers can save time and paper. They can create classes, assign assignments, communicate, and do management, all in one place. Classroom also offers better management. Students can view assignments on the Assignments page, in the class stream, or in the class calendar. All class materials are automatically saved in the Google Drive folder.[15]

In addition, Classroom allows more effective communication flows between teachers and students or between students. Teachers can create assignments, send announcements, and start class discussions in real time. Students can share materials with each other and interact in a class stream or via email. Teachers can also quickly see who has and who hasn't completed an assignment, and instantly provides real-time grades and feedback. Equally important, affordable and secure Classroom is provided free of charge to schools, nonprofits, and individuals and contains no ads and never uses user content or student data for advertising purposes[16].

Classroom Impact on Students

Classroom-assisted online learning is very important for teachers and students because in addition to facilitating teacher and student interactions, it is also a relatively easy learning alternative to support the success of the learning process. Online learning is organized learning through web networks. Each subject provides material in the form of video recordings or slideshows, with weekly assignments to be done within a predetermined time limit and various scoring systems. Online learning eliminates the feeling of awkwardness which in the end makes students dare to experiment in asking questions and expressing ideas independently. free [17]

Online learning is learning that is done without having to meet face to face and can be done anytime and anywhere besides that with this online learning students become brave to express and share ideas so that students are more active and in online learning students use smartphone and laptop facilities that can improve learning outcomes with these facilities online learning runs effectively and efficiently.

Classroom Impact on Teachers

By using classroom as an online learning medium, it can make it easier for teachers to prepare classes, can save time, collect assignments in a simple and paperless manner, can make it easier for students to organize assignments and materials that have been given, establish good communication, do not require large funds[2]. many use it because classroom is provided free of charge so that teachers and students only need an internet network to be able to access it. This explanation is in line with Pratama's opinion, that the benefits of google classroom are: 1) easy preparation for using it, 2) time saving, 3) paperless collection of simple assignments, 3) can improve organization, 5) improve communication, and 6) cost-effective.

Learning outcomes are an inseparable part of existence interaction, process, and evaluation of learning. Student learning outcomes are not all the same, there are students who get satisfactory results, and some have unsatisfactory results. This is inseparable from the ways, methods and learning models used by a teacher to explain the lessons given. The methods, methods and learning models must be made as attractive as possible so that students are interested in the lessons given. Classroom is actually designed to facilitate the interaction of teachers and students in cyberspace. Teachers have the flexibility of time to share scientific
studies and give independent assignments to students besides that teacher can also open discussion rooms for students online[5].

**Impact Of Use of Classroom On Learning Objects**

Classroom is a structured classroom in the current learning process is the learning process through classroom is very easy to do, assignments are very easy saves time because the teacher gives paperless assignments. Besides that teaching materials can still be accessed even though the students are not there class again[1]. Classroom can be operated via mobile phones (HP), desktop computers, or laptops, the use of the classroom can make alternative solutions in overcoming learning problems in the classroom and the quality of learning outcomes can be achieved if you can utilize learning resources properly, such as learning through classroom[12].

**Classroom Advantage**

For those of you who have used Classroom, of course you will feel the benefits and advantages of this application compared to other applications:

a. **Simple**

Google designed the classroom application with very simple integration with G suite for education, so that with this technology educators can focus on carrying out their duties as educators.

b. **Safe**

In addition, Google also guarantees a high level of security when using the Classroom application because this service is integrated with the Gmail service, which has a very good reputation in terms of security. This technology also functions as a storage medium or digital archive for students or educators which, if needed, can be accessed anytime and anywhere.

c. **Broad Integration**

Classroom is also integrated with several other learning applications from Google, such as class craft, Pear Deck, Quizizz, Tynker, Kami, and Little SIS. The collaboration between Classroom and the application will greatly assist educators in providing learning materials.

d. **Cross Platform**

The next advantage is that this application can be accessed on a PC (personal computer) or smartphone. So that educators and students can study, do assignments, and see announcements anywhere without having to meet face to face. So it is very efficient in delivering learning materials, assignments and announcements.

e. **Easy To Use**

The next advantage is its very friendly use. Starting from creating a new class to personalizing the class. All can be done with very simple steps. So that educators can focus on the goal of making the class. Educators are not preoccupied with the complexity of personalization of an application they use.

In addition, Classroom is also economical in terms of internet quota usage. This is because this application focuses on learning, both in delivering material and in giving assignments. Although there is a material link that is shared, the link can be accessed offline after participants download the material or assignment. The last advantage of Classroom is that educators and students can still communicate even under any conditions. Because the Classroom application can be accessed anywhere and anytime. In addition, Classroom also has a mutual comment feature to further improve communication between educators and students.

**3.1 Traditional Versus Networked Classroom**

a. **Traditional Classroom**

- The teacher gives assignments to students.
- Students complete, work on and submit assignments to the teacher.
The teacher evaluates, assesses and returns the results of the assignment.

Students see the results of the assessment of assignments.

b. Networked Classroom

- The teacher gives assignments to students.
- Students work on, complete and submit to a network of connected classes or classrooms.
- Students and teachers view assignments that have been sent in the classroom.

4 Conclusion

Based on the analysis of the discussion above, it can be concluded that the learning process was carried out well using classroom. This is because online learning through classroom in learning activities can be easily accessed by both teachers/educators and students according to the needs of learning activities.

Utilization of learning by using Classroom has a positive impact as can be seen from student learning outcomes which are increasing every day through assignments and quizzes. Students' perceptions of subjects conducted online using the classroom application, namely students feel happy using classroom because it is easy and the teacher/educator is not burdensome by giving a lot of assignments, classroom is flexible, which is easy to access anywhere and anytime, constrained internet access from the absence of a data network or smartphone that is used to support all students for the implementation of e-learning learning.

Thus, the conclusion is that the use of the classroom application in subjects is proven to be effective because it can improve student learning outcomes through planning, processes, results and student learning evaluations.

References


The Impact of Pengembangan Keprofesian Berkelanjutan (PKB) Training for SMK Productive Teacher on The Learning Outcomes Students of SMK in Productive Subjects in North Sumatera

Rivai Simanjuntak¹, Sri Milfayetty², Darwin³, Wanapri Pangaribuan⁴, Joharis Lubis⁵
rivaijuntak70@gmail.com

Management of Education Doctoral Study Program, Universitas Negeri Medan, Indonesia¹²³⁴⁵

Abstract. Learning is the process of behavior change caused by experience and training. This means that the purpose of learning activities is a change in behavior, including knowledge, skills, attitudes, and even covering all aspects of the personal. Training is a variety of introduction efforts to develop the performance of the workforce in the work that is carrying or also something related to its work which means making changes in behavior, attitudes, expertise, and knowledge that are specific or specific. Hypothesis that states there is an influence between the implementation of PKB training for Productive teachers (X) on the learning outcomes students of SMK Teknologi Rekayasa in North Sumatra (Y) is acceptable. Where the results of EDD found that there was an influence on the implementation of PKB training on the learning outcomes students of SMK Teknologi Rekayasa in North Sumatra by 47.7% and the rest by 52.3%. It means that in addition to the implementation of PKB training for productive teachers there are still another influence of 52.3% to affect the learning outcomes students of SMK Teknologi Rekayasa in North Sumatra.

Keywords: Learning Outcomes, PKB Training

1 Introduction

School as an institution or educational institution that is a means of carrying out educational objectives by carrying out the learning process. School is not only used as a gathering place between teachers and learners, but a very complex and dynamic system. In line with that Fattah (2003: 1) said the school is a container where the education process is carried out, has a complex and dynamic system. The school is seen as an organization that requires management by professional people, where the core activities of the school organization manage human resources that are expected to produce qualified graduates, in accordance with the needs of the community. School leavers are expected to make a significant contribution to the nation's development.

Teacher is a part of schools where teacher is one of the factors that have an important role in achieving the success of the teaching and learning process. This means that they are very instrumental in helping the development of learners to realize their life goals optimally. This is in accordance with the results of research conducted by John Hattie (University of Auckland
2017), in his research found that the determining factor of student achievement is dependent on the student itself 49%, teachers 30%, schools 7%, home 7% and friends 7%.

The ability of teachers in mastering their competencies, will determine the success of learning goals through the continuity of the teaching and learning process means that teachers are also required to be able to apply varied teaching methods, so that students feel comfortable in the classroom and comfortable to learn, and change the monotonous learning into a dynamic, active, innovative, creative, effective, and fun.

Law Number 14 of 2005 concerning teachers and lecturers, Chapter II, article 2 states that teachers have a position as professionals at the level of primary education, secondary education, and early childhood education on the path of formal education raised in accordance with the laws and regulations. Furthermore, in article 20 described in carrying out their professional duties teachers are obliged (a) to plan learning, carry out quality learning processes, and assess and evaluate quality learning, and assess, and evaluate learning outcomes, (b) improve and develop academic qualifications and competencies in an ongoing manner in line with the development of technological science and art, (c) act objectively and not discriminatorily on based consideration of gender, religion, ethnicity, race and certain physical conditions, or family background, and socio-economic status of learners in learning, (d) upholding the laws and codes of ethics of teachers and religious and ethical values, and (e) maintaining and fostering the unity of the nation.

To realize and follow up on the mandate of what is expected in the law, the ministry of education and culture implements competency improvement programs for all teachers, including those who are certified, or who have not been certified through program of Pengembangan Keprofesian Berkelanjutan (PKB). PKB program through Teacher Education and Training which is called Teacher Training Program is an effort of the Ministry of Education and Culture through the Directorate General of Teachers and Personnel (Ditjen GTK) in an effort to improve teacher competence. In line with this, teacher competency mapping has been carried out through the Uji Kompetensi Guru (UKG) simultaneously throughout Indonesia so that it can be known the objective condition of teachers today and the need for increasing their competence.

Pusat Pengembangan dan Pemberdayaan Pendidik dan Tenaga Kependidikan Bidang Bangunan Listrik (PPPPTK-BBL) Medan is an extension of the Ministry of Education and Culture under the Directorate General of Teachers, and Education Personnel feels responsible in improving the quality of student competence, therefore PPPPTK BBL Medan continues to improve the quality of competence of vocational graduates in their built areas through PKB activity programs. To find out the extent of the success of this PKB program, it is necessary to evaluate and reflect on the implementation of PKB activities through an EDD entitled “The Impact of Pengembangan Keprofesian Berkelanjutan (PKB) Training For SMK Productive Teacher on The Learning Outcomes of SMK’s Students In Productive Subjects in North Sumatera”.

Learning is an inseparable activity in human life. Consciously or not, this process has actually been done by humans since born to sufficient living needs while developing the potentials that exist in their life. This means that in order to acquire various changes in skills and attitudes, someone must first experience the learning process. According to Sabri (2010: 19) said learning is a process of behavior change due to experience and training. This means that the purpose of learning activities is a change in behavior, include concerning knowledge, skills, attitudes, and even covering all aspects of the personal. Everyone who experiences the learning process will succeed and fail.
Learning outcomes as one of the indicators of achievement of learning goals in the classroom can not be separated from the factors that affect the learning outcome itself. Sugihartono (2007: 76-77), mentions the factors that affect learning outcomes are: a) internal factors is a factors that exist in individuals who are learning. Internal factors include physical factors and psychological factors, b) external factors is a factors that exist outside the individual. External factors include: family factors, school factors, and community factors. All activities carried out will give good or bad results. Students are a target in learning, after students get learning in school need to know the learning outcomes. To find out the learning outcomes and potential that students have after the lesson is done through measurement or assessment. Student learning outcomes are changes that occur in cognitive, affective and psychomotor aspects.

According to Bloom in Sudjana (2009: 22) broadly divides learning outcomes into three areas, which are: (1) cognetif; (2) affective; and (3) psychomotor. The cognetif realm is related to the ability to think which consists of six levels, which are: a) knowledge, b) understanding, c) application, d) analysis, e) synthesis, and f) evaluation. The affective realm concerns the aspect of attitude, where the main one in one's capacity consists of five levels, which are: a) acceptance, b) responding, c) appreciation, d) organizing, and e) self-suffuffification. The psychomotor realm in which behavioral change in this realm relates to skills is: a) imitation, b) manipulation, c) articulation, and d) deepening.

Training is the process by which people achieve certain abilities to help achieve organizational goals. This means that trainees are expected to improve the performance of workers in a particular job that is being responsible, or a job that has to do with their work. According to Noe, Hollenbeck, Gerhart & Wright (2003:251) Training is a planned effort to facilitate the learning of job-related knowledge, skills, and behavior by employee. This means that training is a planned effort to facilitate learning about work related to knowledge, expertise and behavior by employees.

Robbins, Stephen P, (2001:282) Training meant formal training that’s planned in advanced and has a structured format. This indicates that the intended training is a formal training that is carefully planned and has a structured training format. Furthermore Mangkunegara (2005) explained that the stages in training and development include: (1) identifying training needs / need assessment; (2) set training objectives; (3) establish the criteria for success with its measuring instrument; (4) establish training methods; (5) conduct experiments (try outs) and revisions; and (6) implement and evaluate.

The follow-up to the implementation of UKG is realized in the form of post-UKG teacher training which in 2016 was named Program Guru Pembelajar, in 2017 named the Pengembangan Keprofesian Berkelanjutan (PKB) Program, and in 2018 it was named the Diklat Guru Program. The Diklat Guru Program will use face-to-face mode. This program is created to be able to improve the competence of teachers as agents of change and the main source of learning for learners. In 2018, there is expected to be an increase in the achievement of UKG value with a national average of 75.

Design a training program that is applied to vocational teachers (productive teachers) or teachers of competence of expertise. The design of this training program is built from the needs of SMK graduates who must link and match with the needs of the competence of the business world and the industrial world. Therefore, the draft of the training program for teachers of competence expertise for aspects of professional competence refers to Skema Kerangka Kualifikasi Nasional Indonesia (SKKNI). The Teacher Training Program for vocational teachers in SMK is carried out using modules in accordance with the competency units contained in certain clusters in Skema Kerangka Kualifikasi Nasional Indonesia (KKNI) Level IV. The results of self-evaluation of each unit of competence contained in each cluster become
determinants to determine the cluster that needs to be improved professional competence. The training program for vocational teachers ends with an assessment. The assessment results for teachers are a reflection of the Uji Kompetensi Guru (UKG) in the year concerned. The implementation of this activity is carried out in two stages, namely: Full Face-to-Face and Face-to-Face and Self-Study.

2 Research Method

This research is conducted using quantitative methods, namely as a method based on the philosophy of positivism, used in certain populations or samples, sampling techniques are generally done randomly, data collection using EDD instruments, quantitative / statistical data analysis with the aim to test established hypotheses. The data analysis technique used is an inferenceal statistical technique. In the writing of quantitative reports to analyze data used descriptive statistics or inferential statistics. The target population in this EDD is all students of SMK Negeri Bidang Keahlian Teknologi Rekayasa third class in North Sumatra who are taught by teachers after participating in PKB training conducted by PPPPTK BBL Medan by obtaining good predicate scores. The number of teachers who have participated in PKB training that has a good predicate score of 22 people spread across 22 of SMK Negeri in north Sumatra and consists of 8 skill competencies, further from this data obtained the number of students as a population is as many as 1,009 people consisting of.

Arikunto (2003:120), argues that for sampling if the number of subjects is large more than 100 can be taken between 10 - 15%, or 20 - 25% or more and if the subject is less than 100, it is better to take all so that the study is a population study. Based on the above opinion, we took a sample of 10% of the population, thus the number of populations in this EDD is as much as 1009 x 10% rounded 100 people. Instruments used for data collection are first tested for validity and reliability. Tests of instruments are conducted to obtain valid and reliable data collection tools. In this method to disseminate the data of each variable, descriptive statistics are used. The use of descriptive statistics aims to find the highest, lowest, mean, median, mode, and standard deviation scores, then organized in a list of frequency distributions as well as in chart form.

One of the assumptions of regression analysis is linearity. This means whether the regression line between X and Y forms a linear line or not. If it is not linear, then regression analysis cannot be continued. The benefit of regression analysis results is to make a decision on whether the rise and fall of bound variables can be done through the increase of free variables or not. In this testing to test the hypothesis of the implementation of PKB training for productive teachers for Vocational Engineering Technology (X) with Productive Material Student Competency Learning Outcomes (Y) used correlation analysis using the product moment correlation formula, that is:

$$ r = \frac{N \cdot \Sigma X Y - (\Sigma X) \cdot (\Sigma Y)}{\sqrt{(N \cdot \Sigma X^2 - (\Sigma X)^2) \cdot (N \cdot \Sigma Y^2 - (\Sigma Y)^2)}} $$

3 Result and Discussion

Data on the stuffing of PKB training questionnaires highest score, lowest score, average, standard deviation, mode, and median for variable X, as follows:
PKB Training (X)

Based on the results of calculations, PKB training score data (X) obtained that the highest score is 148 and the lowest score is 81. Average value (M) = 123.78; standard deviation (SD) = 14.6; Modus (Mo) = 125.98 and Median (Me) = 125.26. Furthermore, from the calculation of the frequency distribution obtained the ideal mean 96 and the ideal standard deviation of 21.3. More details can be presented in table 4.2 and the histogram in figure 4.1 below:

<table>
<thead>
<tr>
<th>Class</th>
<th>Interval Class</th>
<th>Frequency of Observation (f0)</th>
<th>Xi</th>
<th>(f0 . Xi)</th>
<th>X2</th>
<th>f0 . X2</th>
<th>Class Edge</th>
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<td>21.420.8</td>
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<td>76.050.0</td>
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<td>3</td>
<td>107 – 114</td>
<td>10</td>
<td>110.5</td>
<td>1.105.0</td>
<td>12.210.3</td>
<td>122.102.5</td>
<td>106.5</td>
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<td>14.042.3</td>
<td>266.802.8</td>
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</tbody>
</table>

The table data above explains that the number of respondents who are in the average class of variable data X (123.78) is 29 people or 29%. The number of respondents who were above average was 31 people or 31% while the below average score was 40 people or 40%. To give a clear picture of the distribution of the above score can be shown in the form of the following 4.1 figure histogram:

Student Learning Outcome Data (Y)

From Table 4.1 above, obtained data on student learning outcomes (Y) the highest score is 97 and the lowest score is 72. Average value (M) = 84.7; standard deviation (SD) = 5.11; Mode (Mo) = 82.0 and Median (Me) = 84.45. More details can be presented in table 4.3 and histogram in figure 4.3 below:

<table>
<thead>
<tr>
<th>Class</th>
<th>Interval Class</th>
<th>Frequency of Observation (f0)</th>
<th>Xi</th>
<th>(f0 . Xi)</th>
<th>X2</th>
<th>f0 . X2</th>
<th>Class Edge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>72 – 74</td>
<td>2</td>
<td>73.0</td>
<td>146.0</td>
<td>5.329.0</td>
<td>10.658.0</td>
<td>71.5</td>
</tr>
<tr>
<td>2</td>
<td>75 – 77</td>
<td>3</td>
<td>76.0</td>
<td>228.0</td>
<td>5.776.0</td>
<td>17.328.0</td>
<td>74.5</td>
</tr>
<tr>
<td>3</td>
<td>78 – 80</td>
<td>18</td>
<td>79.0</td>
<td>1.422.0</td>
<td>6.241.0</td>
<td>112.338.0</td>
<td>77.5</td>
</tr>
</tbody>
</table>
The table data above shows that the number of respondents who are in the average class of variable data Y (84.7) is 21 people or 21%. The number of respondents who were above average was 37 people or 37% while the below average score was 44 people or 44%. To give a clear picture of the distribution of the above score can be shown in the form of the following figure histogram 4.2:

![Histogram](image)

**Fig 2. Variable Score Distribution Histogram (Y)**

In testing statistical analysis to test hypotheses, linearity and meaningfulness tests are performed, normality tests, independence tests, and homogeneity tests.

**Linearity and Meaningfulness Test**

This linearity test is done to determine the linear or not relationship of free variables with bound variables as a condition to use statistical techniques and regression analysis. The following is presented with a summary of Analisis Varians (ANAVA) that tests the range and meaning of:

Learning Outcome Variable (Y) Over PKB Training (X):

Regression equation of variable Y over X, such as: The linearity relationship of these two variables can be described as figure 4.3 below:

![Linearity Equation](image)

**Fig 3. Linearity Equation of Learning Outcome Variables (Y) Over PKB Training (X).**
From the results of the calculation obtained the regression equation variable Y over X, that is:

\[ Y = 67.14 + 0.14X \]

**ANAVA summary for regression equation Y over X such as Table 4.4 follows:**

<table>
<thead>
<tr>
<th>Source</th>
<th>Variance</th>
<th>JK</th>
<th>RJK</th>
<th>F</th>
<th>Ft (α=0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>723.400.00</td>
<td>720.801.00</td>
<td>563.08</td>
<td>20.77</td>
<td>4.01</td>
</tr>
<tr>
<td>Regresi (a)</td>
<td>1</td>
<td>720.801.00</td>
<td>720.801.00</td>
<td>27.11</td>
<td>4.01</td>
</tr>
<tr>
<td>Regresi (b/a)</td>
<td>1</td>
<td>563.08</td>
<td>563.08</td>
<td>27.11</td>
<td>4.01</td>
</tr>
<tr>
<td>Residu (s)</td>
<td>98</td>
<td>20.35.92</td>
<td>20.35.92</td>
<td>20.77</td>
<td>4.01</td>
</tr>
<tr>
<td>Galat (G)</td>
<td>57</td>
<td>1.059.76</td>
<td>18.59</td>
<td>1.25</td>
<td>1.96</td>
</tr>
<tr>
<td>Tuna Cocok (TC)</td>
<td>42</td>
<td>976.16</td>
<td>23.24</td>
<td>1.96</td>
<td>1.96</td>
</tr>
</tbody>
</table>

From table 4.4 above it can be seen that Ft (dk; 1.98) at the sinif level the state of 0.05 is 4.01 while Fh 27.11 turns out to be Fh > Ft, which is 27.11 > 4.01. From this it can be said that the regression equation is meaningful. From the table above it can also be seen that Ft (dk; 57:42) is 1.96 while the Fh obtained is 1.25 it turns out that Fh.

Hypothesis that states: there is an influence between the implementation of PKB training for Productive teachers (X) on the learning outcomes students of SMK Teknologi rekayasa in North Sumatra (Y) is acceptable. Where the results of EDD found that there was an influence on the implementation of PKB training on the learning outcomes students of SMK Teknologi rekayasa in North Sumatra by 47.7% and the rest by 52.3%. This means that in addition to the implementation of PKB training for productive teachers there is still another influence of 52.3% to affect the learning outcomes students of SMK bidang Teknologi Rekayasa in North Sumatra.

**Evaluasi Dampak Diklat (EDD)** found the implementation of PKB training for SMK teachers can affect the learning outcomes students of SMK Teknologi Rekayasa. This is in accordance with the general purpose of implementing PKB for SMK teachers. It is clearly stated that the Program Diklat Guru in general aims to improve the ability of teachers in carrying out their duties through improving competence both pedagogically and professionally, as well as having performance as educators and leaders for their students. This means that the implementation of PKB training for productive teachers not only stops at improving the ability of the teacher, but also must be able to be channeled to its learners so that students can feel how important the improvement of teacher achievement through attending PKB training. In other words, the measurement of PKB's success is not only on the out-put level but up to out-come.

In addition, from several special objectives of pkb training for SMK teachers, among others, are (a) showing the ability as professionals in carrying out their duties as teachers, (b) having performance as educators and leaders for their learners, and (c) being an example of toughness, optimism, and cheerfulness for students. In addition, SMK teachers who participate in PKB training are required to be able to disseminate the skills obtained to fellow peers in their respective schools, especially must be able to continue the knowledge and knowledge obtained when participating in training to their students. Thus, the knowledge and knowledge possessed by its learners will increase.

As the manager of student activities, teachers are expected to be the teachers and helpers of students, not only when they are in the classroom but also when they are outside the classroom, for example in the laboratory or in SMK known as workshops (bengkel). In terms of guiding, teachers need to actualize or realize their ability in guiding activities in learning activities and guiding learning experiences. Guiding students' learning activities, especially when teaching not only means preaching in front of the class, but also provides the widest opportunity for the student to do his learning activities.
In guiding the experience of the students, teachers are required to connect them with their environment. This is important because in the experience of interacting with the environment that actually the students experience the learning process. In addition to guiding, teaching must also mean helping students to develop and be able to adjust to their environment. As a result, teaching activities are not only so that students master the knowledge / subject matter, then towards to the higher step or get high grades, but also so that he uses his knowledge and skills in everyday life.

Likewise, PKB training activities, where when this activity has ended, then the participants of the training must be able to implement it to their respective learners. In addition, that the implementation of activities must also be held properly as well. From the data obtained that the level of tendency to implement PKB training for SMK teachers still falls into the category of sufficient, therefore it needs to be developed and improved the implementation of PKB activities to be able to obtain a good level of tendency.

For example, in the services of participants, either through the organizer or by facilitators in their respective departments. In addition, the materials delivered by facilitators to be more useful with technological advances, according to the needs of teachers with industry demands in accordance with SKKNI. In addition, it is also no less important methods or models displayed by the facilitator able to attract the attention of the participants of the training.

This EDD has been tried as much as possible to get optimal results in accordance with the objectives of EDD, although the author is aware of the limitations and various shortcomings of EDD. EDD data is obtained through the filling of questionnaires provided to selected respondents and the collection of Ujian Kompetensi Kejuruan (UKK) results from students. Angket is used to capture data on the implementation of PKB training for productive teachers compiled by the research team, therefore this study is inseparable from the shortcomings and limitations. These limitations are as follows:

a. To collect data on PKB training variables for productive teachers, it is used to be given to students as respondents. Measurement in this way has limitations such as a person's ability to read and understand the statements of each item, one's personal views and understandings and willingness to express personal circumstances in a way.

b. The EDD instrument made by the author is only carried out once, although based on valid and reliable statistical calculations, therefore the weakness of the instrument used still remains. Instruments are made in the form of questionnaires so that the results obtained are very dependent on the honesty of respondents. In this case, the author has anticipated the weakness by not including the identity of the respondent on the instrument, appealed to answer the questionnaire honestly and informed the respondent that the results of the questionnaire had no effect on learning outcomes or achievement in school.

c. UKK data collection is very limited, where the author does not directly supervise the sample when carrying out the exam but is supervised by the teacher of the field of study concerned in their respective schools. Furthermore, the value or results obtained are the results of the design given by each school.
4 Conclusion

Based on the EDD results outlined, the conclusions are as follows:

a. There is a positive and significant influence between PKB training for productive teachers of SMK Teknologi Rekayasa on The Learning Outcomes Students of SMK Teknologi Rekayasa in North Sumatra.

b. The influence of PKB training for productive teachers of SMK Teknologi Rekayasa on the Learning Outcomes Students of SMK Teknologi Rekayasa in North Sumatra Province is 47.7%, and the remaining 52.3% outside of PKB training for Productive Teachers of SMK, this indicates that the more often attend PKB training for productive teachers of SMK, the higher the learning outcomes students of SMK Teknologi Rekayasa in North Sumatra Province.

c. The level of tendency from the training of PKB productive teachers in SMK Teknologi Rekayasa in North Sumatra is still in the category of sufficient.

d. There are still some teachers who have participated in PKB training has not implemented the knowledge and knowledge they gained during pkb training to their respective students.

References

Development of Virtual Laboratory for Chemical Kinetics

Risnita Vicky Listyarini¹, Fransisca Ditawati Nur Pamenang²
{risnita.vicky@usd.ac.id¹, fransiscadita@usd.ac.id²}

Chemistry Education Study Program, Sanata Dharma University, Indonesia¹²

Abstract. This study aims to develop a virtual laboratory for the chemical kinetics subject. This research is a Research & Development which refers Borg and Gall model which has been modified until the product validation stage. The instrument used in the study was a research data collection questionnaire, media and material expert validation questionnaire. The resulting product is a virtual laboratory developed using the Java programming language and student worksheets. The validation results in terms of material have a percentage of 97.22% and terms of media have a percentage of 94.31%. This research is expected to provide innovations in the use of virtual laboratories to create an interactive learning atmosphere for students.

Keywords: virtual laboratory, development, chemistry practicum

1 Introduction

Chemistry is a complex science, as much of the knowledge in this field relates to the molecular level, and students are expected to think on a molecular scale to explain phenomena on a macroscopic scale [1-3]. Therefore, learning practical chemistry in the laboratory cannot be separated from learning chemistry theory. Practical work in the laboratory (practicum) is a way for students to build an understanding of chemical concepts with practical experience with chemical tools and materials [4].

During the COVID-19 pandemic that is still engulfing the world, practical chemistry learning is a part of chemistry learning that is significantly affected. Skills that should be learned through practice in the laboratory are hampered because learning is done online. Practical learning of chemistry must adapt to online learning situations without reducing the meaning and skills to be achieved from the learning. One of the solutions for chemistry practicum in online learning is the use of a virtual laboratory.

A virtual laboratory is a new generation of computer-based chemistry learning [5]. Initially, a virtual laboratory was developed to solve problems encountered in conventional chemistry practice classes, namely practicums involving explosive and dangerous chemicals [6]. A virtual laboratory is a program that contains the same laboratory materials as a real laboratory [7]. Students can do practicums independently as if they were in a real laboratory[8]. The virtual laboratory is seen as a new approach in learning practical chemistry that is cheaper in terms of tools, materials and preparation time but still attracts students' interest. The virtual laboratory is seen as a new pedagogy for teaching in particular for enhancing students critical thinking and helping financially challenged institutions [9].
Virtual laboratories also have the potential to increase student motivation in learning chemistry [10]. Chemistry learning with virtual practicum is learner-centered and inquiry-based that supports higher-order thinking skills and meaningfulness in chemistry learning [6]. Virtual laboratories have the potential to increase student motivation in learning chemistry. Chemistry learning with virtual practicum is learner-centered and inquiry-based that supports higher-order thinking skills and meaningfulness in chemistry learning.

Chemistry practicum learning with a virtual laboratory will be created using the Java programming language. The Java programming language was chosen because it is straightforward and platform-independent [11]. This study aims to develop a virtual reaction kinetics practicum to overcome the limitations of practical work in the laboratory due to online learning situations. This research is also expected to know the motivation of students in learning chemistry practicum through a virtual laboratory.

2 Research Method

This is a research and development (R&D) that aims to develop a product using modified Borg and Gall [12]. The development steps carried out in this study are presented in Figure 1.

![Fig 1. Research model modified from Borg and Gall](image)

Finding problem and potential and data collection were conducted questionnaire. Need analysis was performed at this stage to find the information related to learning conditions in practical laboratory work for the chemical kinetics subject. The product design was conducted by the concepts and material substance in chemical kinetics for the development of a virtual laboratory in chemical kinetics. The title of chemistry practicum developed in this research is Factor that Affects the Reaction Rate.

The design of the virtual laboratory was developed Microsoft Office PowerPoint and was converted for interactive virtual laboratory using Java programming language. The product was validated by two lecturers in the Chemistry Education Study Program, Sanata Dharma University in terms of material and media. The quality of the virtual laboratory was assessed based on the validation of results in terms of material and media. The data analysis was performed by categorizing it into the validity rating category [13, 14].

$$P = \frac{f}{N} \times 100\%$$

- $P$ = percentage
- $f$ = score from validator
- $N$ = maximal score

The average percentage then is calculated, and the result was compared with the validity rating category.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>81% - 100%</td>
<td>Very Good</td>
</tr>
</tbody>
</table>
3 Result and Discussion

The first stage of this research is a need analysis that includes the identification of potentials and problems as well as data collection. Identification of potentials and problems is carried out using descriptive analysis of the results of student responses questionnaires related to the implementation of online practicums as well as the reflection of the lecturers of chemical kinetics subject [15]. The need analysis was conducted by involving the students of the Chemistry Study Program of Sanata Dharma University. During the online course, the practicum in chemical kinetics was conducted using videos uploaded in the YouTube channel of the Chemistry Study Program of Sanata Dharma University.

The important aspects contained in the questionnaire are as follows:

a. Effective use of practicum videos
b. Weaknesses of using practicum videos
c. Difficulties experienced by students in online practicum

Based on the results of the questionnaire, as many as 55% of students answered that the implementation of practicum through video was quite effective. The reason given by the students was because the video was easy to access and could be played back if there was an unclear practicum procedure. In addition, students thought that practicum using video was the right solution during the Covid-19 pandemic. As many as 5% of students consider the use of practicum videos to be ineffective. This is related to the preparation of practicum reports. Students have difficulty in writing practicum reports only based on observations from videos. Careful observation is difficult. Students think that practicum should be practiced directly in the laboratory. The long video duration also makes students feel bored. On the other hand, some students think that the duration of the video in the reaction phenomenon section is too short.

Based on the results of the questionnaire, as many as 91.7% of students considered the unobservable reaction phenomenon to be one of the weaknesses of using practicum videos. Students feel that they do not get a clear picture of the phenomena that occur during the practicum, for example, changes in the reactions of the compounds being tested. The phenomenon of gas formation after the reaction takes place is difficult to observe. As many as 68.3% of students considered that another weakness of using practicum videos was not sharpening their practical skills. The results of the questionnaire showed that as many as 85% of students quite understood the entire implementation of the practicum through video, and only 15% of students understood the practicum. Students think some work procedures are difficult to understand.

Preliminary studies are also based on the results of reflections carried out by practicum lecturers. The results of the reflection stated that there were several obstacles in the use of practicum videos. The difficulties are also experienced when explaining the reaction phenomena that occur. Many important phenomena that arise when chemical reactions occur, cannot be conveyed properly to students. The use of practicum videos also reduces students' skills in carrying out practical’s. Students cannot directly experience the use of laboratory equipment,
preparation of practicum materials, implementation of work procedures, to observing reaction phenomena. This of course reduces the real meaning of practicum. Based on the identification of problems and the results of reflection, a virtual laboratory is needed that can overcome the problems experienced by students. As many as 86.7% of students have never used a virtual laboratory. This is a good opportunity to introduce virtual laboratories to students. According to 80% of students, this virtual laboratory can overcome the limitations of practicum implementation during online learning during the Covid-19 pandemic. This is supported by [16].

The first step in developing a product is to design a virtual laboratory display. The design of virtual laboratory display was developed Microsoft Office PowerPoint. The design then was converted for interactive virtual laboratory using Java programming language. The main components in the virtual laboratory are a) Title; b) Initial Information and Trial Objective; c) Theoretical background; d) Observation Data Form, and e) Start Practical Work. Several screenshots from the virtual laboratory design are depicted in Figure 2 – 9. Figure 2. is the main page of the virtual laboratory. The students can click the play button (main button in the middle) when they are ready. Figure 3 shows the initial information menu of virtual laboratory.

![Fig 2. Main Page View of Virtual Laboratory](image1)

![Fig 3. Initial Information Menu](image2)

Figure 4. depict the observation data form that can be downloaded by the students so they can write the observation data while conducting the practicum. The beginning of practicum is the aim of the practicum depicted in Figure 5. For the theoretical background of the practicum, it is shown in Figure 6 that the students can read the theory before starting the practicum, so they understand the fundamental theory for conducting the practicum.

![Fig 4. Observation Data Form](image3)

![Fig 5. The aim of the practicum](image4)

![Fig 6. Theoretical Background](image5)
Before starting the virtual laboratory, it is showed the practicum video made by Chemistry Education Study Program, Sanata Dharma University. This video can give the students a better understanding of the practicum about the overall procedures of Factor that Affect the Reaction Rate which is depicted in Figure 7. The chemicals and glassware for practicum are shown in Figure 8.

The practicum procedure is shown in Figure 9. There is an instruction procedure that leads the user for conducting a practicum. The user can use drag and drop to practice and follow the instruction procedure. The phenomenon of reaction will show while the user conducting the practicum. The observation data of practicum can be written in the observation data form that can be downloaded in the initial information menu. By interacting and actively conducting practicum using virtual laboratory, it is expected the students understanding and scientific skill increase than using usual practicum video. After conducting the practicum, ten questions can be answered as a posttest evaluation for students. The comprehensive virtual laboratory is developed for also evaluating students’ understanding after conducting the practicum.

The product that has been developed was validated by two material validators and two media validators. The validators are lecturers at the Chemistry Education Study Program, Sanata Dharma University. The validation result in terms of material is presented in Table 2. The validation aspects include 1) relevance of the material to the syllabus; 2) material quality; 3) systematics of material presentation, and 4) aspects of language and writing. The average percentage for validation in term of material have an average percentage of 97.22% which is very good. The validators stated that the material inside the virtual laboratory is already following the syllabus.

<table>
<thead>
<tr>
<th>Table 2. Validation Results in Term of Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
</tr>
<tr>
<td>----</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>
The validation results in terms of media are presented in Table 3. The aspects of validation are 1) function and advantages; 2) visual media aspects; 3) audio media aspects; 4) language aspects; 5) writing aspects; 6) programming aspects. The results of validation in term of media got an average percentage of 94.31% which indicates that the product is very good and feasible.

Table 3. Media Validation Results

<table>
<thead>
<tr>
<th>No</th>
<th>Aspects</th>
<th>Average percentage = 94.31%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Functions and Advantages</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Visual Media Aspect</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Audio Media Aspect</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Language Aspect</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Writing aspect</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Programming Aspect</td>
<td></td>
</tr>
</tbody>
</table>

The suggestions from the validator are used to improve the product. A few comments from validators are 1) the improvement of the drag and drop menu; 2) the addition of the home button; 3) making a slower transition for the chemical phenomenon of changing colour. The suggestion from validators will be considered for the revision of the virtual laboratory.

4 Conclusion

The development of a virtual laboratory in chemical kinetics for the topic Factor that Affects the Reaction Rate has been successfully developed. The product has been validated by validators in terms of material with an average percentage of 97.22% with very good criteria. The validation result in terms of media gets an average percentage of 94.31% with very good criteria. This virtual chemistry laboratory has the potential for further use of chemistry learning.

Acknowledgement

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References


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Student's Perception of Teaching Materials Based on Short Film (A Preliminary Finding)

Muhammad Fitri Rahmadana¹, Reza Aditia²
{mufitra@unimed.ac.id¹, rezaditia@gmail.com²}
Universitas Negeri Medan¹,²

Abstract. Various ways are done by educators, including using short films as teaching material. However, there has not been much research on this topic. This research investigates student perceptions to determine the feasibility of developing short film-based teaching materials as an alternative to conventional ones. A total of 78 respondents answered questionnaires distributed using an online questionnaire platform. Research findings found that the development of short film-based teaching materials has a high urgency to increase student interest and learning outcomes for research methodology courses.

Keywords: Short film, Teaching material.

1 Introduction

When students see, hear, and do something, they are more likely to remember and understand it. When students see, hear, and produce material while learning, their understanding of a subject or course is higher (75%) than when they only see during learning (20%) or only see and hear during learning (40%) [1]. Multimedia elements, such as videos, have been shown to be effective for learning activities [2]. Learners can see, hear and produce the behavior or learning outcomes needed from these subjects/courses.

There are various kinds of online media, including videos, that allow the availability of these elements. YouTube, TeacherTube, and Vimeo are video repositories where you can find a variety of videos. [3]. Video clips from movies, television shows, music and instructional videos, vlogs or video blogs, and amateur videos can all be downloaded, viewed, and shared. YouTube is currently the most popular social media to be created and shared, besides providing comments as a form of interaction on specific youtube channels that are being watched.

Learning has been proven to be effective using social media. Students can use social media to develop higher-order thinking skills such as decision-making and problem-solving, as well as communicate and collaborate. [4] [5]. In addition, videos can be designed as they learn in class [4] and learning becomes more interesting [5]. As a result, YouTube has the potential to be used as a teaching medium, both as a video with audio and visual elements and as a social media platform.

Multimedia, including videos, has been shown to be effective for learning in studies. Multimedia has been shown to increase knowledge when used in the teaching and learning process [3]. Furthermore, videos are effective for learning while reducing the amount of time spent listening to lectures [6]. In problem-solving tasks, videos aid students' cognitive and
social development [2]. When videos are shown at the right times during the teaching process, it improves the effectiveness of the lesson [7].

There hasn't been a lot of research done on how YouTube can be used in education. However, studies in academic fields such as medicine [8] and architecture [9] have used YouTube for teaching. Videos are used for out-of-class teaching in academic subjects in Salman Khan's Flipped Classroom, while face-to-face training with instructors takes place in the classroom [3].

Experts agree that studies on YouTube for teaching are necessary [10]. The potential use of YouTube in transforming classroom education is an exciting and essential study [10]. However, the teacher's role remains essential in monitoring access to these social media sites [11] [3]. In addition, the selection of video as a learning medium is still minimal, because currently more popular videos are uploaded, especially on Youtube [3].

This research will later be expected to help academics understand student perceptions to determine the feasibility of developing short film-based teaching materials as alternative learning that can be done. In addition, schools and other higher education institutions can also benefit from this study because it will determine whether innovative and creative ways to achieve academic achievement can be carried out using instructional video media.

2 Research Method
The purpose of this survey is to find out what people think about something [12], [13]. Because the information it wants to know is the perception of students who have taken research methodology courses, this study uses stratified random sampling [13] to select the sample. Researchers used online questionnaires to collect data because they are currently the most effective and efficient method of capturing respondents' responses through a questionnaire instrument [13]. The descriptive statistical analysis was used in the data analysis.

3 Result and Discussion
A total of 78 respondents answered questionnaires distributed by researchers using an online questionnaire platform. In table 1, it can be seen that the majority of students are quite satisfied with the study of the research methodology courses they have received, which can be reflected in questions 2 and 3. those who are satisfied and dissatisfied with the learning they receive are still relatively thin. From the 2nd question (Is the lecture process for the research methodology courses that you have been living by your expectations?), respondents who answered that the lectures had not met expectations were 46.2%.

From the 3rd question (Is the lecture process The research methodology courses that you have taken so far are easy to understand and packaged attractively?), respondents who answered that the lecture process was still not packaged attractively were also not less numerous, namely as many as 48.7%. This, of course, cannot be ignored, lest students' learning satisfaction be based solely on "chance," which is based on who the lecturers they study with are.

Regarding whether respondents know short film-based teaching materials, the majority of respondents answered that they already knew about this (65.4%), but more respondents had never been taught this type of teaching material (52.6%). When asked if they felt the need to accept learning using short Film-based teaching materials, 78.2% answered they needed to accept short film-based learning. In addition, 83.3 respondents have the
perception that if the research methodology courses are taught using short film-based teaching materials, the teaching materials will be able to increase their interest in learning, and 84.6% of respondents have the perception that these teaching materials will be able to improve their learning outcomes.

Table 1. Descriptive statistics on the answers to the questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the process of studying research methodology courses that you have been living by your expectations?</td>
<td>No</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>42</td>
</tr>
<tr>
<td>Is the lecture process for the research methodology courses you have been going through easy to understand and attractively packaged?</td>
<td>No</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>40</td>
</tr>
<tr>
<td>Do you know about short film-based teaching materials?</td>
<td>No</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>51</td>
</tr>
<tr>
<td>Has the research methodology lecture process you have been going through used short film-based teaching materials?</td>
<td>No</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>37</td>
</tr>
<tr>
<td>Do you feel that you have the maximum competence for the research methodology courses you are taking?</td>
<td>No</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>37</td>
</tr>
<tr>
<td>Do you feel the need for short film-based teaching materials for research methodology courses?</td>
<td>No</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>61</td>
</tr>
<tr>
<td>Do you feel that research methodology courses taught with short film-based teaching materials will increase your interest in learning as a student?</td>
<td>No</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>65</td>
</tr>
<tr>
<td>Do you feel that research methodology courses taught with short film-based teaching materials will improve your learning outcomes as a student?</td>
<td>No</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>66</td>
</tr>
</tbody>
</table>

4 Conclusion

Based on the development stages that have been developed, it can be concluded that the development of short film-based teaching materials has a high urgency to increase student interest and learning outcomes for research methodology courses. Furthermore, implementing the video production is also continuously carried out to cover as much material as needed. Thus, the researcher suggests that lecturers participate in developing short film-based teaching materials, given the high student interest in this type of teaching material.

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Development of the Chemistry in Life Course Toolkit
to Improve the Quality of Student Learning during the
Covid-19 Pandemic

Muhammad Fajar Marsuki1*, Isnanik Juni Fitriyah2, Erti Hamimi3, Firdha
Cahyaningwulan4, Febriana Nur Fauziah5
{muhammad.fajar.fmipa@um.ac.id}
Department of Science Education, Universitas Negeri Malang, Malang, East Java, Indonesia12345

Abstract. The Covid-19 pandemic has forced the education process to run virtually. Therefore, every learning process requires e-learning which is arranged systematically to improve the quality of student learning. This study aims to develop e-learning content (modules, handouts, assessment instruments, presentation slides, and video podcasts) in a Moodle-based LMS for the "chemistry in life" course at the Department of Science Education, State University of Malang. The development was carried out using the R&D method by Borg and Gall and product trials were carried out on 112 students with a pretest-posttest design model. The results of the validation questionnaire by the experts showed that the product developed was feasible to use. The Wilcoxon test on the students' pretest and posttest results showed a significance of 0.000 which was smaller than \( \alpha = 0.05 \) and indicated a difference between the students' pretest and posttest results. The mean value of N-Gain shows the number 0.4373 which is included in the category of intermediate improvement from the students' pretest scores to the students' posttest scores.

Keywords: E-Learning, R&D, Chemistry in Life, Moodle

1 Introduction

The learning process in the classroom is always built by several elements, namely educators, students, learning strategies, learning media, and teaching materials. These five elements of learning are very influential on the success of a learning process. The learning process is said to be successful if students experience changes in behavior as a result of the stimuli and experiences they receive during the learning process. However, the learning process generally always has its problems. This problem is often caused by one of the five elements of the learning process. Problems in the learning process are usually specific depending on the characteristics of the class [1–5].

The Department of Science Education, Universitas Negeri Malang has four courses related to the field of chemistry. They are Basic Chemistry, Elements and Compounds, Physical Chemistry, and Biochemistry. Elements and Compounds courses include courses in the field of chemistry which are considered difficult for students of the Department of Science Education, Universitas Negeri Malang.

This is due to the very broad nature of the learning materials covering elements, organic compounds, and inorganic compounds. In addition, these materials are considered not essential to be thoroughly mastered by students of the Department of Science Education, Universitas
Negeri Malang, who are expected to become science teachers at the Junior High School level in the future. Therefore, stakeholders in the Department of Science Education, Universitas Negeri Malang, agreed to replace the Elements and Compounds course with Chemistry in Life in the 2020 curriculum. The Chemistry in Life course is expected to be more focused on chemistry concepts that are close to student life so that it is more suitable to be taught to prospective Junior High School science teachers who will teach science in everyday life to Junior High School students.

However, the change of Elements and Compounds courses into Chemistry in Life courses in the 2020 Curriculum of the Department of Science Education, Universitas Negeri Malang gave birth to a new problem. Stakeholders in the Department of Science Education, Universitas Negeri Malang must rearrange all learning tools that will be used in the course [6–8]. This is due to its very different nature from the Elements and Compounds course. The learning tools in question are modules that contain material, handouts, evaluation questions, and learning media.

In addition, the central government's policy for the implementation of Distance Learning during the COVID-19 pandemic will also continue in 2021 [9–12] and the policy of the Chancellor of the Universitas Negeri Malang requires the learning process to be carried out through SIPEJAR (Moodle Based LMS) leads to the development of learning tools for Chemistry in this Life courses must be digital-based. Therefore, digital learning tools for Chemistry in Life courses in the 2020 Curriculum of the Department of Science Education, Universitas Negeri Malang are indispensable to support the lecture process.

2 Research Method

The development of digital learning tools for the Chemistry in Life course was carried out by adapting the development model of Borg and Gall (1997) [13]. The development of digital learning tools for the Chemistry in Life course is divided into several stages. The first stage is the preliminary stage where the researcher analyzes the learning outcomes of the course and analyzes the needs of the equipment and what content is needed. The second stage is the development stage where researchers design product prototypes, product validation to experts, product prototype revisions, and product trials. The third stage is the dissemination and implementation of products in learning.

The product prototype validation stage is carried out by two experts by filling out a validation questionnaire. The product trial was conducted on 112 students by filling out a product readability test questionnaire. All questionnaires in this study used a Likert scale of 1-4 and the results were analyzed using descriptive statistics. The researcher also tested the effectiveness of the product using a pretest-posttest design with the Wilcoxon method to see the difference between the pretest and posttest data and the N-Gain to see changes in the value from pretest to posttest.

3 Result and Discussion

By the development method carried out, the development team conducted an analysis of the CLO and SCLO of the Chemistry in Life course at the Department of Science Education, Universitas Negeri Malang. From this analysis, the development team concluded the distribution of materials as shown in Table 1 below.
Table 1. Results of Analysis of Course Learning Outcomes (CLO) and Sub Course Learning Outcomes (SCLO)

<table>
<thead>
<tr>
<th>CLO</th>
<th>SCLO</th>
<th>Class Type</th>
<th>Number of Meetings</th>
<th>Tool Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>5.1.1</td>
<td>Theoretical</td>
<td>4 Meetings</td>
<td>Modules/Books, PowerPoint, Videos</td>
</tr>
<tr>
<td>5.1</td>
<td>5.1.2</td>
<td>Theoretical</td>
<td>1 Meeting</td>
<td>Modules/Books, PowerPoint, Videos</td>
</tr>
<tr>
<td>5.1</td>
<td>5.1.3</td>
<td>Theoretical</td>
<td>2 Meetings</td>
<td>Modules/Books, PowerPoint, Videos</td>
</tr>
<tr>
<td>5.1</td>
<td>5.1.4</td>
<td>Theoretical</td>
<td>3 Meetings</td>
<td>Modules/Books, PowerPoint, Videos</td>
</tr>
<tr>
<td>5.2</td>
<td>5.2.1</td>
<td>Experiment</td>
<td>2 Meetings</td>
<td>Experiment Handout</td>
</tr>
<tr>
<td>5.2</td>
<td>5.2.2</td>
<td>Experiment</td>
<td>1 Meeting</td>
<td>Experiment Handout</td>
</tr>
<tr>
<td>5.2</td>
<td>5.2.3</td>
<td>Experiment</td>
<td>1 Meeting</td>
<td>Experiment Handout</td>
</tr>
</tbody>
</table>

Based on Table 1, there were 10 meetings devoted to theoretical topics and 4 meetings for practical topics. The remaining 2 meetings are for the midterm and end-semester exams. From the analysis above, the development team concluded that a module or book containing 10 chapters was needed according to the number of theoretical topics. The module or book is registered with the ISBN so that it can be used both in print and digitally. In addition, experiment handouts are also needed for 4 practicum topics that can make it easier for students to understand what they will do in the laboratory. To accompany the modules or books that have been made, the development team agreed to make learning media in two forms, PowerPoints and explainer videos for each of these topics [14–16].

For the remaining 2 meetings, the development team made two test assessment instruments in the form of multiple-choice of 50 items which were divided into 25 items for the Mid-Semester Examination and 25 item questions for the Final Semester Examination. After the draft module or book, PowerPoint, explainer video, and assessment instrument were developed, the development team asked two experts who have competence in the fields of chemistry and education to conduct an assessment and correction of the draft learning device using a questionnaire. Validation has been provided by the development team by using the Google Form application. Table 2 shows the validation results from these experts.

Table 2. Expert Validation Results for Learning Toolkit

<table>
<thead>
<tr>
<th>Product</th>
<th>Aspect</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book</td>
<td>Media</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>Material</td>
<td>96</td>
</tr>
<tr>
<td>Experiment Handouts</td>
<td>Media</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Material</td>
<td>100</td>
</tr>
<tr>
<td>Media PowerPoint and Video</td>
<td>Media</td>
<td>94</td>
</tr>
<tr>
<td>Explaner</td>
<td>Material</td>
<td>100</td>
</tr>
<tr>
<td>Assessment Instrument</td>
<td>Cognitive Assessment Instruments</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Instruments for Assessment of Presentation</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Performance and Preparation of Papers</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Practicum Performance Assessment Instruments and Report Preparation</td>
<td>100</td>
</tr>
<tr>
<td>Average Score</td>
<td></td>
<td>98</td>
</tr>
</tbody>
</table>

As shown in Table 2, the learning tools developed for the Chemistry in Life course at the Department of Science Education, Universitas Negeri Malang gets an average score of 98 from the two validators, which indicates the tools that have been compiled by the development team are very valid and can be used in the trial stage. Some aspects of validation do not seem to get
the maximum value because there are still some shortcomings found by the validator. Some suggestions from the validator include the problem of writing errors (typo) and the need to include information about the cognitive level on the cognitive assessment instrument for each question [17–19].

Product trial involving students of the Department of Science Education, Universitas Negeri Malang who took the Chemistry in Life course in the 2021/2022 academic year. The students who took the product trial were divided into three classes/offerings, namely offering A with 40 students, offering B with 37 students, and offering C with 39 students, so that a total of 112 students took part in the trial. The trial was carried out in two stages. The first stage is to ask students to see the device that has been developed by the development team and fill out a readability questionnaire to assess the feasibility of the device.

The second stage is to give pretest and posttest to students to measure the effectiveness of the learning tools that have been made by the development team in improving students’ cognitive abilities. This second stage is carried out using only the cognitive assessment instrument for the Mid-Semester Examination due to the limited time available to carry out the effectiveness test up to the Final Semester Examination.

The readability test was carried out by asking 112 students of the Department of Science Education, Universitas Negeri Malang who took the Chemistry in Life course in the 2021/2022 academic year to fill out a readability test questionnaire for modules, experiment handouts, and media. The product of the assessment instrument was not included in the readability test because the assessment of the assessment instrument was more suitable to be carried out by experienced experts than the subject of the assessment instrument.

The results of the readability test on the module, experiment handouts, and media are shown in Table 3 below.

<table>
<thead>
<tr>
<th>Product</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book</td>
<td>90</td>
</tr>
<tr>
<td>Experiment Handouts</td>
<td>91</td>
</tr>
<tr>
<td>Media PowerPoint and Explainer Video</td>
<td>86</td>
</tr>
<tr>
<td><strong>Average Score</strong></td>
<td><strong>89</strong></td>
</tr>
</tbody>
</table>

Based on the results of the readability test conducted by the development team to students of the Department of Science Education, Universitas Negeri Malang who took the Chemistry in Life course in the 2021/2022 academic year from Table 3, the development team obtained scores for books, practicum handouts, and PowerPoint media and explainer videos are 90, 91, and 86 with an average value of 89. This value is in the very high category range [20] so that the learning tools that have been made by the development team can be declared very suitable for use in the lecture process.

Effectiveness test data totaling 112 pretest values and 112 posttest values were first tested for normality to see whether the data were normally distributed or not. Based on the results of the normality test of the pretest and posttest data in Table 3, the pretest and posttest data showed a significance value of 0.032 and 0.000 respectively when analyzed using the Kolmogorov-Smirnov method. The two significance values are smaller than the value of $\alpha = 0.05$ which indicates that both the pretest and posttest data are not normally distributed [21]. On the other hand, the pretest and posttest data also yielded a significance value of 0.250 and 0.000 respectively when analyzed using the Shapiro-Wilk method. The significance value of the
pretest data looks bigger than the value of $\alpha = 0.05$, while the significance value of the posttest data looks smaller than the value of $\alpha = 0.05$.

This indicates that the pretest data is normally distributed, while the posttest data is not normally distributed [22]. Based on the description above, the development team decided that it was not possible to perform a parametric difference test on the pretest and posttest data, so as an alternative, the development team conducted a nonparametric difference test using the Wilcoxon method.

Wilcoxon test results on pretest and posttest data using SPSS can be seen in Table 4 below.

<table>
<thead>
<tr>
<th>Table 4. Wilcoxon Test Results on Pretest and Posttest Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Statistics</strong></td>
</tr>
<tr>
<td>Posttest - Pretest</td>
</tr>
<tr>
<td>Z</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
</tr>
<tr>
<td>a. Wilcoxon Signed Ranks Test</td>
</tr>
<tr>
<td>b. Based on negative ranks</td>
</tr>
</tbody>
</table>

Based on the Wilcoxon test results on the pretest and posttest data shown in Table 4, the development team obtained a significance value of 0.000. The significance value is smaller than the value of $\alpha = 0.05$. The conclusion from the Wilcoxon test is that $H_a$ is accepted [23], which means that there is a significant difference between the pretest data and the posttest data produced by students of the Department of Science Education, Universitas Negeri Malang after attending lectures using learning tools that have been made by the development team. After that, the development team also conducted an N-Gain test on the pretest and posttest data to see the direction of the change in the pretest to posttest data.

Based on the results of the N-Gain test on the pretest and posttest data, the development team obtained a mean N-Gain value of 0.4373. This value is in the medium category. According to Hake (1999), the N-Gain value with a range of 40% to 55% is in the less effective category [24]. This indicates that the learning tools used are less effective in increasing the cognitive level of the students of the Department of Science Education, Universitas Negeri Malang. After the development team discussed with each other to find the cause of the ineffectiveness of the learning tools, the development team concluded that several factors caused the less effective results, including the following:

a. The pretest and posttest data used only come from the cognitive assessment instrument for the Mid-Semester Examination (UTS) so that it cannot describe the cognitive level of students as a whole in one semester.

b. Students do not do practical work directly in the laboratory due to the COVID-19 pandemic, which forces learning to take place online.

c. The existence of a limited face-to-face policy since November 2021 at the Universitas Negeri Malang also causes some participants to not be served optimally because online and offline learning must be carried out at the same time.

However, apart from several factors causing the ineffectiveness of the results of the effectiveness test on pretest and posttest data conducted by students of the Department of Science Education, Universitas Negeri Malang, the development team has created a valid learning tool based on the validation process and feasible based on the readability test process by the user. Therefore, the development team will continue to make improvements to the resulting devices to be more effective and make it easier for students to take Chemistry in Life course at the Department of Science Education, Universitas Negeri Malang.
4 Conclusion

A learning toolkit has been produced that can be used both for offline and online learning and can also be used through Moodle LMS for the Chemistry in Life course at the Department of Science Education, Universitas Negeri Malang. The learning tools consist of books with ISBN, practical handouts with IPR, PowerPoint media, and explainer videos as well as assessment instruments. The learning device was considered very valid by the validator (score 98) and very feasible by the user (score 89) to be used in the lecture process.

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References

STEM Professional Development of Teachers in Under-Resourced Contexts

Salomey Tardy Hackman
{shackman@s.eduhk.hk}

Department of Curriculum & Instruction, The Education University of Hong Kong

Abstract. Numerous studies have shown that the success of STEM education at the implementation stage largely depends on teacher preparedness. Within this conversation, positive results of STEM teacher preparation programmes appear to be primarily based on outcomes achieved in STEM-supported classrooms and entirely in resource-rich education settings, where access to resources is assumed mainly as given. STEM education can be costly to implement because it often necessitates a well-equipped infrastructure and access to numerous resources. Given the need to 1) foster higher-order thinking skills, educational literacy, and digital responsibility in 21st-century education, and 2) the scarcity of integrated STEM intervention-based research in these under-resourced settings, we argue that supporting teachers through well-designed professional development activities to prepare teachers to implement this approach within such settings is compelling. Therefore, this paper focuses on identifying STEM professional development strategies that may help teachers implement STEM despite their minimal access to resources.

Keywords: STEM education, Challenging Contexts, Resources, Teacher Professional Development

1 Introduction

The success of STEM education largely depends on the successful implementation in the classroom through integrated STEM. Integrated STEM involves identifying, applying, and integrating science, technology, engineering, and mathematics (STEM) concepts to understand multifaceted problems and devise novel solutions. Implementing this approach in the classroom is what is referred to as STEM integration.

An integrated STEM approach is considered very useful in addressing the root causes of the leaky pipe situation and low STEM literacy at the classroom level because this approach is anchored on the argument that the world's problems are complex and require integrating several subjects and applying diverse skills and concepts to solve them (English, 2017; Gardner & Tillotson, 2019; Honey et al., 2014; Kurup et al., 2017, 2019; Kelley & Knowles, 2016; Roehrig et al., 2021; Tan et al., 2019). Despite the importance of integrated STEM, most teachers do not believe they are competent or prepared to execute it in their classrooms (English, 2017, Kelley & Knowles, 2016, Margot & Kettler, 2019).

The importance of preparing teachers to implement STEM in their classrooms has been emphasized in numerous studies because teachers who do not feel competent or understand the value of STEM integration in the curriculum to their students and society will not implement it in their classrooms. Despite the usefulness of the integrated STEM approach, many studies highlight under-prepared teachers as a significant challenge to implementing it (Roehrig et al.,...
2021; Stohlmann et al., 2012; Thibaut et al., 2018). For example, recent studies emphasize that only a small percentage of teachers feel adequately prepared or competent to incorporate the integrated STEM approach in their teaching (Du et al., 2019; Guzey et al., 2016; Tuttle et al., 2016). This is because they lack the essential expertise and skills to teach engineering content or practices, despite their appreciation of the necessity of integrated STEM (Anderson & Li, 2020; Du et al., 2019; Guzey et al., 2016; Tuttle et al., 2016).

Many recent studies emphasize that the lack of basic infrastructure, resources, and materials also serve as a significant barrier to the successful implementation of STEM in the classroom in several contexts (e.g., Arshad, 2021; Ejiwale, 2013; Goodpaster et al., 2012; Margot & Kettler; Park et al., 2017; Thomas & Falls, 2019; Stohlmann et al., 2012). For example, Chowdury et al. (2020) asserted that access to resources, infrastructure, and professional development was significant in implementing STEM education in Bangladesh.

However, the question of which strategies of integrated STEM can be appropriately implemented within K-12 classrooms in challenging or under-resourced environments (e.g., environments lacking access to a reliable network connection, electricity, lab equipment, and laptop computers or smartphones) remains ill-defined, although there has been an increase in research on integrated STEM professional development. For example, Makonye & Dlamini (2020) underscore the difficulties associated with implementing integrated STEM within Africa contexts because of the numerous economic challenges (e.g., electricity access, internet access, infrastructure) associated with them and the need to devise and identify effective classroom strategies for teachers to ensure African nations are not excluded from STEM advancements.

This is important because effective STEM teacher professional development programmes consider the problems teachers face in their differing teaching contexts (Makonye & Dlamini, 2020; Owens et al., 2018). Our argument also indicates the need for researchers to document effective ways to successfully prepare different teachers to implement integrated STEM initiatives in diverse school contexts.

2 The Value of STEM

The justifications for STEM inclusion in the classroom is centred around student learning, the rapidly growing demand for STEM workers, and the societal advantages. Firstly, Students who participate in integrated STEM learning have been found to outperform their peers who participate in traditional STEM learning, which consists of separate disciplines such as Science, Technology, Engineering, and Mathematics (Murphy et al., 2019; Nadelson et al., 2013; Thibaut et al., 2018).

These researchers argue that when teachers use an integrated STEM approach, students will participate in learning activities that facilitate inquiry, problem-solving, retention, and critical thinking. Furthermore, STEM integration has been shown to boost students' non-cognitive learning outcomes (e.g., STEM interest, motivation to learn STEM), potentially increasing the number of STEM graduates (Ring-Whalen et al., 2018; Sanders, 2009; Thibaut et al., 2018; Wang et al., 2011).

Secondly, workforce talent shortages partly fuel the incentive to integrate STEM (Ejiwale, 2013; Nadelson & Seifert, 2017). STEM in industry, research and society currently leans more towards the integrated end of the spectrum (Anderson & Li, 2020; Nadelson & Seifert, 2017; Xue & Larson, 2015). Integrated STEM learning has the potential to produce a competitive future workforce with 21st-century skills, according to previous studies (e.g., Asghar et al., 2012; Ejiwale, 2013; Mustafa et al., 2016; Ring et al., 2017).
Finally, Integrated STEM has enormous societal benefits. It establishes strong STEM literacy foundations, increases STEM diversity, equity, and inclusion, prepares the STEM workforce for the future and makes a country globally competitive (Bryan et al., 2021; Mustafa et al., 2016; Nadelson & Seifert, 2017). In addition to pursuing STEM careers, several studies suggest that ensuring STEM literacy in a population should be a top educational priority (e.g., Bybee, 2010; Kennedy & Odell, 2014; Zollman, 2012). For example, Blom (2016) suggest that Sub-Saharan Africa requires more and better STEM skills and knowledge to enhance value-added and productivity in critical areas such as extractive industries, energy, transportation, and light manufacturing to undergo economic change (p.6). To realize the benefits of integrated STEM, well-prepared teachers are crucial for successfully implementing this initiative (Asghar et al., 2012; El-Deghaidy & Mansour, 2015).

3 Teacher Preparation to Implement STEM

Teachers are the primary drivers of educational reform; thus, it is critical to prepare them to implement STEM education and adopt relevant teaching approaches. Teachers' preparedness and context-based solutions to support them are required for the success of STEM education in the classroom. Teacher preparedness is critical because STEM requires teachers to have 1) specialized subject content knowledge, 2) exposure to various fields of science and mathematics, 3) experience with engineering and technology, and 4) familiarity with appropriate pedagogies (Akerson & Buck, 2020; Asghar et al., 2012; Thibaut et al., 2018). Sadly, most teachers may not have the knowledge, experience, and skills required to develop and implement lessons that show the synergies between subjects and root the learning in real-life situations (Asghar et al., 2012; Kurup et al., 2019; Shernoff et al., 2017; Song, 2019; Woo et al., 2019). Therefore, raising teacher quality is undeniably crucial for improving students' STEM learning environments and opportunities (Al Salami et al., 2017; Du et al., 2019; Honey et al., 2014).

Currently, education leaders have started implementing programs that have been associated with improvements in teacher practice because of the growing body of research on effective STEM professional development (Balyk et al., 2018; Brand, 2020; Du et al., 2019; Gardner et al., 2019; Kelley et al., 2020, 2021; Knowles et al., 2018). Existing studies on STEM-focused professional development agree that teachers who participate in such programs show a significant increase in knowledge, different aspects of instructional effectiveness, and awareness of the value of STEM integration (e.g., Aydin-Gunbatar et al., 2020; Balyk et al., 2018; Du et al., 2019; Kelley et al., 2020; Knowles et al., 2018; Kuehnert et al., 2019; Luft et al., 2020).

For example, a longitudinal case study conducted by Du et al. (2019) revealed that teachers who participated in STEM professional development showed: 1) considerable growth in lesson design, classroom implementation, and mathematics and science skills, 2) a noticeable shift from the traditional method of teaching to more student-centred approaches, 3) increased pedagogical skills, and 4) an increase in their value of STEM integration.

A systematic review conducted by Chai (2019) to investigate the impact of reform-based professional development in STEM also highlighted that most studies reported positive changes in teachers perceived relevance, implementation of science and engineering practices in the classroom, and connecting science to other subjects. Even though STEM professional development research is rising in developing nations, studies in under-resourced settings are few (Ismail, 2018; Kurup et al., 2019; Song & Zhou, 2020). This highlights the need for
researchers to document practical approaches to prepare different teachers to successfully implement integrated STEM initiatives in various school settings (Kelley et al., 2021).

4 Preparing Teachers through Effective STEM Professional Development in under-resourced contexts

Although there are different perspectives on what constitutes an effective STEM professional development (English, 2016; Goodnough et al., 2014), some common features emerge from the literature that can be applied in under-resourced contexts. A review of several studies reveals that effective STEM teacher professional development: 1) focuses on student-centered instructional practices related to STEM integration (Asghar et al., 2012a; Dare & Ring-Whalen, 2021; Du et al., 2019; Gardner et al., 2019; Knowles et al., 2018; Schrader et al., 2015; Siew et al., 2015); 2) engages teachers as active learners (Brown & Bogiages, 2019; Bush et al., 2020; Du et al., 2019; Erdas Kartal et al., 2018; Faikhamta et al., 2020; Ring et al., 2017), 3) involves teachers in collaboration (Bush et al., 2020; Dare & Ring-Whalen, 2021; Du et al., 2019; K. Gardner et al., 2019b; Hsu & Yeh, 2019; Knowles et al., 2018), 4) include opportunities for feedback and reflection (Aydin-Gunbatar et al., 2020; Brown & Bogiages, 2019; Burrows et al., 2021; Bush et al., 2020; Dare et al., 2018; Ring et al., 2017), 5) provides follow-up support in the form of reflective coaching cycles, expert support, mentoring, and professional learning communities (Aydin-Gunbatar et al., 2020; Brenneman et al., 2019; Kartal et al., 2018; Gardner et al., 2019; Kelley et al., 2020; Schrader et al., 2015), and 6) are of sustained duration in terms of contact hours and intensity (Burrows et al., 2021b; Bush et al., 2020; Du et al., 2019; Gardner et al., 2019; Perez, 2018).

Teachers also commonly highlighted these elements as their STEM professional development needs that must be considered when designing STEM professional development (Affouneh et al., 2020; Goodnough et al., 2014; Owens et al., 2018). These elements, when utilized, result in changes in teachers’ perception about their knowledge, design abilities, implementation abilities, assessment abilities, skills, value beliefs, and in the long run, classroom practices in STEM integration and do not require many resources (Avery & Reeve, 2013; Kurup et al., 2017; Song & Zhou, 2020; Thibaut et al., 2018; Woo et al., 2019).

4.1 Student-centred STEM pedagogy

Gardner and colleagues (2019) contended that the instructional design incorporated in STEM professional development programs should be student-centred, experiential, and open-ended to ensure teachers implement the integrated STEM approach in their lessons. Since integration is the main issue of contention, teachers need to be exposed to strategies to carry out the integrated STEM approach in their classrooms.

Several studies of integrated STEM professional development literature reveals Inquiry-Based Learning, Project-Based Learning, Problem-Based Learning, and Engineering Design in a cooperative learning environment as the primary instructional approaches used to aid teachers in implementing integrated STEM in their classrooms (Asghar et al., 2012; Bush et al., 2020; Dare & Ring-Whalen, 2021; Du et al., 2019; Kelley et al., 2020; Knowles et al., 2018; Nadelson et al., 2012; Ring et al., 2017a; Schrader et al., 2015).

Experiencing project-based and inquiry-based integrated STEM activities ground the teaching and learning of STEM content in an authentic context, highlight the relationships
between the STEM disciplines, and increase teachers value, competence, and skills in STEM integration (Aydin-Gunbatar et al., 2020; Guzey et al., 2020, Nadelson et al., 2013). Although all the approaches are relevant, only two (i.e. project-based learning and inquiry-based learning) will be employed in this paper because of their applicability to the study context as an initial step of introducing integrated STEM in under-resourced contexts.

The effectiveness of inquiry-based learning approaches as an integrated STEM instructional practice in secondary schools supports the inclusion of this method in teachers’ professional development (Kurup et al., 2019; Nadelson & Seifert, 2017; Thibaut et al., 2018). Furthermore, existing studies show that this pedagogical approach equips teachers with the skills (e.g., planning experiments, using technology, designing products) and knowledge needed to engage students in authentic STEM activities, scientific inquiry, argumentation, and engineering practices and increase their awareness of STEM careers (Burrows et al., 2021b; Guzey et al., 2020; Knowles et al., 2018; Nadelson et al., 2012, 2013).

For example, a study conducted by Aydin-Gunbatar et al. (2020) revealed that engaging science teachers in inquiry-based STEM activities during professional development significantly improved their knowledge about the implementation of assessment in their integrated STEM lessons. Professional development in scientific inquiry is possibly even more crucial because it is underscored as the current curricula rationale for when teachers encounter unfamiliar content such as those often linked with STEM teaching and learning in many places with little access to resources (Chabalengula & Mumba, 2012; Gardner et al., 2018; Makonye & Dlamini, 2020; Mohammed et al., 2020; Ssempala, 2017).

Professional development designed with the underpinnings of Project-Based Learning will help science teachers gain the competence and value they need to implement STEM elements in lessons (Kelley et al., 2020; Nadelson et al., 2012; Schrader et al., 2015). Teachers who participated in STEM project-based learning workshops improved their understanding of the concept of integration, gained new experience for STEM integration in the classroom, designed lessons in authentic contexts across STEM disciplines, became more creative and innovative in the school, gained first-hand experience in design challenges and valued the interdisciplinary nature of STEM projects, and became more aware of STEM careers according to existing research (Aydin-Gunbatar et al., 2020; Knowles et al., 2018; Margot & Kettler, 2019; Schrader et al., 2015; Siew et al., 2015).

Incorporating this approach is significant to this study because Siew et al. (2015) revealed that science teachers perceived that the teaching approach helped enhance their integrated STEM teaching competence and value beliefs despite the limited resources in their schools. Similarly, Capraro et al. (2016) contend that this approach works well in rural, under-resourced, and diverse settings. Teachers must have opportunities to immerse themselves in and explore learning in the integrated STEM strategies to understand how to use this new approach in the classroom (Brown & Bogiages, 2019).

4.2 Active Learning

Active participation in STEM activities is one of the essential sources of teacher learning (Aydin-Gunbatar et al., 2020). This is because during active learning, teachers are involved in the different types of learning activities and learning environments they would engage their students in (Aydin-Gunbatar et al., 2020; Darling-Hammond et al., 2017). To gain the competence to implement integrated STEM pedagogical strategies, teachers must experience first-hand through fully engaging in the integrated STEM practices as part of their preparation (Brown & Bogiages, 2019).
For example, engaging teachers in the use of Burke's (2014) 6E instructional model (engage, explore, explain, engineer, enrich, and evaluate) is useful because it helps them improve their design and technological inquiry skills (Akerson & Buck, 2020; Anderson & Li, 2020; Lin et al., 2021). Active learning opportunities, a hallmark of adult learning theory, allow teachers to transform their teaching rather than just layering new strategies on the old ones (Darling-Hammond et al., 2017; Trotter, 2006). As a result, experiencing integrated STEM activities as if they were students would provide useful knowledge regarding potential challenges that learners might encounter or possible suggestions that they might come up with to plan and implement the integrated STEM activities in the classroom (Aydin-Gunbatar et al., 2020).

4.3 Collaboration

Bringing teachers from similar grade levels, schools, or departments to collaborate on professional development goals is another important aspect of STEM professional development. This intentional interaction enables educators to meaningfully reflect on and discuss the essential themes of professional development (Bush et al., 2020; Du et al., 2019; Knowles et al., 2018).

A study by Owens et al. (2018) and Asghar et al. (2012) on effective STEM professional development revealed that secondary school teachers believed an ideal program would leverage teachers' collective experiences and provide opportunities for discussions with colleagues similarly engaged in efforts to enhance their practice. The social constructivist theory (Dewey, 1969; Vygotsky, 1978) builds on cognitive constructivism by proposing that when people collaborate, they develop more complex and advanced conceptual constructs (Hodson & Hodson, 1998; Vygotsky, 1978).

As a result, STEM professional development experiences should be built around the idea of professional collaboration, which will help shape and deepen teachers' knowledge, skills, understanding, and value of integrating STEM into the classroom (Hsu & Yeh, 2019; Kelley et al., 2020; Knowles et al., 2018; Ring et al., 2017).

4.4 Feedback and Reflection

Reflection and feedback, both critical components of adult learning theory, are two other powerful tools in effective STEM professional development (Dare & Ring-Whalen, 2021; Kelley et al., 2020; Knowles et al., 2018; Margot & Kettler, 2019). High-quality STEM professional learning often includes time for teachers to reflect on their practice, get feedback, and make improvements as a result of that reflection and feedback (Bush et al., 2020; Dare & Ring-Whalen, 2021; Darling-Hammond et al., 2017; Kartal et al., 2018; Gardner et al., 2019). Teachers can use reflection to get deeper insights into their understandings of integrated STEM teaching and learning (Aydin-Gunbatar et al., 2020; Darling-Hammond et al., 2017; Kartal et al., 2018). Teacher reflection is critical because it helps teachers articulate their value beliefs, experience, and knowledge, which develops and enhances their teaching competence (Aydin-Gunbatar et al., 2020; Brown & Bogiages, 2019; Darling-Hammond et al., 2017; Kartal et al., 2018).

4.5 Duration

Exceptional STEM professional development programmes are structured to provide teachers adequate time to practise using their new knowledge and instructional approaches (Gardner et al., 2019; Luft et al., 2020). Effective professional development gives teachers enough time to gain knowledge and skills, practice, and implement new strategies that help them change their practice. Although the length of STEM professional development varies according to
studies (Burrows et al., 2021; Du et al., 2019; Gardner et al., 2019; Shernoff et al., 2017), scholars suggest that the time must be sufficient to support teachers' value, competency, and pedagogical changes (Aydin-Gunbatar et al., 2020; Kartal et al., 2018).

According to various studies (e.g., Anderson & Tully, 2020; Darling-Hammond et al., 2020; Desimone, 2009; Du et al., 2019; Perez, 2018), professional development programs with more than twenty hours of immersive workshop contact time result in changes in teaching competence, values, and practice. Furthermore, engaging and supporting teachers for a total of eighty hours or more for an academic year or semester increases the likelihood that teachers will use the pedagogical strategies taught (Anderson & Tully, 2020; Darling-Hammond et al., 2020; Desimone, 2009; Du et al., 2019; Perez, 2018). Shrader (2015) also suggests that blended learning approaches may provide an ideal context for integrated STEM professional development in contexts with limited contact time available to teachers.

4.6 Follow-up Support

The purpose of follow-up support is to ensure that learned strategies or skills are retained and applied effectively (Owens et al., 2018; Perez, 2018). Research suggests that teachers face additional challenges when integrating STEM lessons into their classrooms because they rarely get enough practical experience from workshops (Al Salami et al., 2017; Anderson & Tully, 2020; Brenneman et al., 2019; Chai, 2019; Perez, 2018).

Consequently, long-term interventions embedded with follow-up support, such as follow-up interventions and ongoing facilitation of teacher learning, are considered more effective than one-time, short-term interventions (Gardner et al., 2019; Conradty & Bogner, 2020). Integrated STEM professional development must address this by providing ongoing support and follow-up in the form of coaching or expert scaffolding as teachers implement new integrated STEM strategies (Gardner et al., 2019; Owens et al., 2018; Schrader et al., 2015).

Follow-up through coaching and expert support can foster the implementation of the instructional strategies, reinforce knowledge already learned, and help boost teachers’ perceived teaching competence (Brenneman et al., 2019; Cotabish et al., 2011; Perez, 2018). It is also equally crucial that extra help from experts is given to teachers in schools with limited resources to implement what they have learned successfully (Brenneman et al., 2019; Du et al., 2019; Schrader et al., 2015).

This is because after an intensive professional development program, some studies (e.g., Brenneman et al., 2019; Du et al., 2019) highlight that teacher show an increased need for material resources and funding, which is absent in resource-constrained environments (Brenneman et al., 2019). Therefore, a practical integrated STEM professional development embeds teacher education in the context of classroom practice and models what classroom teaching and learning should look like, including the use of a constructivist facilitation approach (Bush et al., 2020; Owens et al., 2018; Srikoom et al., 2018). This follow-up support through coaching, mentoring, and expert support model effective practice and provide feedback and suggestions for overcoming the challenges associated with program implementation in resource-constrained environments (Brenneman et al., 2019).

A review of STEM professional development research reveals that follow-up support is offered to teachers in the form of periodic school visits, in-class observations, discussion of issues and challenges with teachers, provision of feedback, evaluative comments, co-planning, and answering questions from teachers, which lasts between three to six weeks per cycle (Al Salami et al., 2017; Anderson & Tully, 2020; Brenneman et al., 2019; Chai, 2019; Richmond et al., 2017).
In these studies, during each cycle of follow-up support, mentors, coaches and teachers: 1) work together to plan how the group learning experiences from the workshop could be integrated into the existing lesson, 2) schedule observation of one or more of the lesson implementations, 3) reflect on what went well and what could be improved based on evidence from the lesson, and 4) Set improvement goals and a plan to implement them in a future lesson (Al Salami et al., 2017; Anderson & Tully, 2020; Brenneman et al., 2019; Chai, 2019; Richmond et al., 2017). The changes in teacher practice depend on and are deepened by such extended support (Owens et al., 2018; Schrader, 2019; Du et al., 2019).

4 Conclusion

The primary argument of this paper is that a well-designed teacher professional development intervention may help prepare teachers to implement in the classroom, empowering them to stimulate their students’ motivations and interests toward STEM. Consequently, six practical elements and strategies applicable to under-resourced contexts should be incorporated in any intervention to enhance the different components of teacher’s preparedness in terms of their STEM integration skills, attitudes, beliefs, competence.

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References


Teachers Quality Improvement Strategy in the Future

Hottua Samosir\textsuperscript{1}, Satria Darma\textsuperscript{2}
\{hottuarealy@gmail.com\}

Faculty of Economics, Prima Indonesia University, Indonesia\textsuperscript{1}
Sekolah Tinggi Agama Islam Negeri Mandailing Natal, Indonesia\textsuperscript{2}

Abstract. Education is a conscious and planned effort to develop the potential of students to have strong spirituality, good self-control, strong personality, intelligence, noble character, and have adequate skills as their future capital. Efforts to improve the quality of education influenced by many factors. Where one factor affects others. However, the most important factor is the teacher, because good and bad of the teaching and learning process in the classroom strongly influenced by teacher’s quality. The teacher known as the hidden curriculum, because students as signs to be imitated or used as learning materials will accept attitudes and behaviours, professional appearance, each ability, and everything that is inherent in the teachers’ personality. For most parents, educators or teachers still seen as representatives of parents when their children are not in the family.

Keywords: Quality Improvement; Teacher Candidates

1 Introduction

Entering the twenty first century is checked by the increasingly absorption of voters of the globe community in an exceedingly wide and various social organize that' furthermore receptive all citizens. This happens since it's bolstered by the utilize of information and communication innovation altogether angles of life. The presence of data innovation interfaces the world that rises above topographical boundaries so that the world gets to be borderless and permits the improvement of connections with anybody, anytime, anplace, in different shapes, to be specific sound and pictures that show data, information, and occasions in an moment. Mentally, these conditions will lead to changes within the cognitive outline, improvement and plurality of needs, shifts in needs within the esteem framework.

These days, changes in scholastic execution measures happened in line with the improvement of data and communication innovation (ICT) and worldwide financial development [1]. So it cannot be denied that educator polished skill towards data innovation may be a need that cannot be deferred any longer, beside the expanding advancement of data innovation in this computerized time. In other side, [2] The increasing workload of future trainers, especially due to the rapid changes in society caused by significant changes in values, the resulting changes in communication innovation and the increasingly effective use of political life. Clarify. To foster a solid and useful national and financial life that requires modern skills and state of mind to confront competition.

Conceptually, instructors as experts must meet different competency necessities to carry out their obligations and specialists professionally, whereas the genuine conditions within the field
are still exceptionally concerning, both in terms of amount, quality and polished skill of instructors. This issue is still compounded by the different challenges ahead that are still complex in this worldwide period. Instructors who come from the predigital world discover it troublesome to construct successful communication with children or understudies from the computerized period. Their propensities and ways of learning are certainly exceptionally diverse from those of their instructors and guardians. This regularly makes both parties, understudies on the one hand and instructors and guardians on the other hand, at last both become baffled since there’s a disengage between understudies and instructors. Students - digital natives - receive information quickly from various multimedia sources, while teachers - digital immigrants - provide information slowly and from limited sources (using only textbooks, for example). Students like to do several activities at once (such as completing assignments while listening to music from an iPod or smart phone), while the teacher wants to do only one thing at a time.

The students prefer to see the picture, listening music and see the video first before seeing the text, while the teacher gives the text first before showing the picture or listening or watching the video. Students want to access hyperlinked multimedia information randomly, the teacher prefers to provide information in a linear, logical and sequential manner. Students like simultaneous interaction with many people (other students), the teacher wants students to work independently. Students like lessons that are relevant, interesting and can be used immediately, the teacher wants to follow the curriculum and meet standardization [3], [4].

In managing with all the advancements that exist within the computerized period such as social advancements, data innovation and culture which of course moreover influence students' considering styles, a technique for expanding instructor polished skill is required so as to produce truly professional instructors at the side the improvement of data innovation because it is nowadays.

2 Literature Review

2.1 Education in Digital Era

The digital era has had a great influence on the lives of Indonesian people. Social life is changing quickly since the world is progressively bound together, particularly upheld by propels in data and communication innovation, so that the boundaries of society and the state are now not constrained. Included within the worldwide alter is the instructing calling. In agreement with the requests of changing society, the teaching profession too requests polished skill. Proficient instructors are now not figures who work as robots, but are dynamists who lead participants' possibilities towards imagination.

The International Commission for 21st Century Education which is marked by the digital era formed by UNESCO reports that in this digital era education is carried out by relying on four pillars of education, namely learning to know, learning to do, learning to be, and learning to live together [5]. In learning to know, students learn important knowledge according to the level of education that followed. In learning to do students develop skills by combining the knowledge mastered with practice (law of practice), so that a skill is formed that allows students to solve problems and challenges of life. In learning to be, students learn to become complete individuals, understand the meaning of life and know what is best and should be done, in order to live well. In learning to live together, students can understand the meaning of life with other people, by respecting each other, respecting each other, and understanding the existence of
interdependence. Thus, through these four pillars of education, it is hoped that students will grow into complete individuals, who are aware of all rights and obligations, and master science and technology for their livelihood.

2.2 Teacher Professionalism

Instructor polished skill alludes to the state, course, esteem, reason, and quality of information and specialist within the circle of education and educating that's tied to the job of a individual. Proficient instructors, on the other hand, are teachers with the essential abilities to carry out instructive and educating activities. In other words, a proficient educator may be a individual with extraordinary capacities and competence within the field of instruction who is able to perform his or her obligations and capacities as a instructor to the finest of his or her capacity. Proficient instructors are well-educated, well-trained, and have a riches of ability in their disciplines. [6].

A educator must have five qualities in arrange to be considered a proficient: a) a commitment to understudies and the learning prepare; b) a careful understanding of the materials/subjects he instructs and how to instruct them to understudies; c. Instructors are dependable for checking understudy learning results through different implies of assessment; e. Instructors are able to think efficiently approximately what they are doing and learn from their encounters; c) Instructors ought to be able to think efficiently around what they are doing and learn from [7].

Furthermore, a teacher's professionalism must be backed up by competencies that must be held, which comprise the following four criteria [8].

2.1.1. Pedagogic Competence

Within the National Instruction Benchmarks, the clarification of Article 28 section (3) point a states that academic competence is the capacity to oversee understudy learning which incorporates understanding understudies, planning and actualizing learning, assessing learning results, and creating understudies to actualize their different possibil.

2.1.2. Personal Competence

Within the National Instruction Guidelines, the clarification of Article 28 passage (3) point b, it is expressed that what is implied by identity competence is the ability of a identity that's consistent, steady, develop, astute, and definitive, being a part demonstrate for understudies, and having respectable character

2.1.3. Professional Competence

Within the National Instruction Guidelines, the clarification of Article 28 passage (3) point c states that what is implied by proficient competence is the capacity to ace learning materials broadly and profoundly which permits directing understudies to meet the competency standards set out within the National Instruction Benchmarks.

2.1.4. Social Competence

Within the National Instruction Benchmarks, the clarification of Article 28 section (3) point d states that what is implied by social competence is the capacity of instructors as portion of the community to communicate and connected successfully with understudies, individual teachers, instruction staff, parents/guardians of understudies., and the encompassing community.
3 Method

This ponder employs subjective investigate with writing ponder strategies, so that the information collection in this ponder separated from reference books and a few diaries.

Data analysis was carried out by reading library sources to obtain the necessary data with the following steps [10]: a) Reading: read all the information in the research whether there is information in accordance with the background of the research problem; b) Collecting: collect sources of study materials that are relevant to the problem in research; c) Quoting: to quote the information contained in the reading can be in the form of quotations, paraphrasing and writing down the results of the study into the cards provided; d) Taking: take notes on important things by first seeing which ones are important by also studying the index on the back of the book to look for pages relating to those recorded on the cards provided; e) Summarizing: conclude the results obtained; and f) Interpreting: interpret the results obtained.

4 Result and Discussion

4.1 A Challenges of Professionalism Teacher in the Digital Era

The educating calling within the 21st century, which is stamped by the computerized period, is unequivocally affected by the utilization of data and communication innovation. The demand for teacher professionalism at this time is that in addition to having good moral information and being able to convey methodologically, they must also be able to utilize various sources of information scattered in the community into teaching and learning activities. However, the reality is that in general, the speed of technology and dynamics is not balanced with the situation of the teacher itself, especially in society, so that it often leaves teachers far behind. When people enter the information age, which includes the sharing of knowledge and information, the teachers themselves are left behind. And for example, the teacher starts trying to change himself, the changes and progress he experiences will still be difficult to adjust because changes in society outside his environment are still more advanced and always lose steps. And the image emerges that the teacher is out of date.

In this digital era, teachers with artificial abilities can teach large numbers of students, and can even serve students scattered all over the world. The teacher no longer only controls the students who learn in the classroom, but he is able to teach millions of students in “world class” providing services individually at the same time. So with internet information technology, knowledge can be transmitted at high speed. The demand for ability and opportunity to accumulate, process, analyse, synthesize data into information, and then become useful knowledge is very important in today's information world [5].

This condition, will affect the habits and culture of teachers who have been doing this. Because, knowledge will be spread everywhere and everyone will easily obtain knowledge without difficulty because it is obtained through the means of “internet” and other “information media”. “This paradigm is known as distributed intelligence (distributed knowledge) and with this paradigm, it appears that it is the work of teachers/lecturers/educational teach that will inevitably switch from a source of information to ended up a “mediator” of information. Hence, the long life learning handle within the casual world which is more learning based than educating based will be the key to the advancement of human assets.
So the new paradigm of the education system in this digital era, students are considered to have initial knowledge, and the task of the teacher is only to construct it. Students are analogous to plants that already have the potential to grow and develop, while the teacher only functions as a sprinkler that helps plants grow and develop properly. As a result, the teacher's role in teaching has changed from being a teacher to a facilitator with a student-centred learning model, no longer teacher-centred. The future learning process is independent of students in exploring their curiosity with the problem-solving approach given by the [3].

Instructors in this century and the following century are challenged to quicken the advancement of data and communication. Classroom learning and classroom administration, in this century must be adjusted to the benchmarks of progresses in data and communication innovation. According to [11] and [12] there are 7 challenges for teachers in the 21st century (digital era), namely: a) Teaching in a multi-cultural society with multilingual competence, b) teaching to construct meaning (concepts), c) teaching for active learning, d) teaching and technology, e) teaching with a new view of ability, f) teaching and choice, g) teaching and accountability.

The challenges above are formidable challenges that we must face with readiness and using the right strategy. This strategy must of course be different from what has been applied before. If the wrong formulation is used, the changing times will be toxic to future generations.

4.2 Strategies to face challenges of professionalism in the Digital Era

The digital era, whose stages have begun at this time, has really had a colossal impact on the world of instruction. The world of instruction nowadays is truly confronted with a reasonably extreme challenge, the dealing with of which needs a procedure by including different related parties. Strategy can be deciphered as an effort made by a individual or organization to reach at a objective. What is meant by a instructor proficient improvement technique may be a strategy or exertion made by a individual or organization in creating instructor polished skill? Becoming a professional teacher facing the digital era at least has the following characteristics:

a. Having a commitment to the student learning process
b. Mastering in depth the subject matter and how to teach it
c. Able to think systematically about what he does and learn from his experience.

The procedure suggestions in confronting the challenges of educator polished skill within the computerized time are as takes after:

4.2.1 Development of Pedagogic Competence

Instructive competence or the capacity of teaches to supervise learning is the spine of the triumph of the educator handle in schools. This instructive competence is related to awesome and appropriate direction techniques, so that the learning plan can run effortlessly and effectively.

To make strides this academic capacity, instructors got to be given preparing related to educating strategies in schools which incorporate:

4.2.1.1 Discussion Method.

This strategy is more compelling than the address strategy, since the discourse requires mental and thought as well as the trade of suppositions. In extension, dialogs are as well more communicative, able to clarify things that are still dubious, and able to reveal the level of development of each understudy.

4.2.1.2 Case Study Method.
This procedure is especially noteworthy for think approximately programs that emphasize the application of a law to a case, for case inside the workforce of law or the workforce of cultivation, and others. A case is utilized as texture for understudy exchange underneath the course of the teachers.

4.2.1.3 Tutorial Method.

This strategy is an task to a few understudies around a specific protest, at that point they talk about it with specialists in their field to guarantee the legitimacy of their understanding of the protest.

4.2.1.4 Team Teaching Method

This technique is an assignment to many understudies around a particular dissent, at that point they conversation nearly it with aces in their field to guarantee the genuineness of their understanding of the disagree.

4.2.2 Development of Information and Technology Competence

The advancement of science and data innovation, particularly in instruction, is right now developing. Modernization in instruction makes everything smoother and simpler; a few of the supporting variables for instruction are the web, Wi-Fi offices, and computers or tablets that utilized to back advance in instruction. The world of instruction is required to take after ceaselessly the stream of the improvement of science and innovation that's developing quickly, since instruction that remains on the guidelines educational programs will as it were make disharmony with mechanical propels progressively unavoidable.

Teaches who are in assention with the conditions of globalization in this computerized period are educates who are able to expert and control changes that are consistent and mechanical. The characteristic of a educators is to have the capacity to anticipate, oblige, and reorient existing progressions.

To develop this information technology capability, the following things needed:

a. Availability of technological facilities and equipment, in the form of computers, videos, projectors, internet equipment, and so on.

b. Availability of content and materials related to the method of using information technology to support teaching methods and implementation of the educational curriculum.

c. Organizing training for teachers on how to use these information technology tools, so that in time they can also teach them to students. Thus, the learning process will take place more effectively and productively.

With the utilize of innovation within the world of instruction, it trusted it would enable the instructing and learning handle to be more inventive and competitive.

4.2.3 Development of Personal Competence

Identity competence could be a individual capacity that reflects a unaltering, steady, develop, astute, and definitive identity, gets to be an illustration for understudies, and has respectable character. Seen from the mental viewpoint of educator teacher competence appears individual capacities that reflect identity:

a. Steady and stable, specifically having consistency in acting concurring to pertinent lawful, social and moral norms;

b. Adult, which implies having the autonomy to act as an teacher and having a work ethic as a teacher;

c. Wise and wise, that's, the appearance is advantageous for understudies, schools and the community by appearing openness, in considering and acting;
d. Authoritative, specifically the conduct of instructors who are regarded so that they have a positive impact on understudies; and

e. Have respectable character and have conduct that can be imitated by understudies, act agreeing to religious standards, be genuine, true and like to assist. The esteem of identity competence utilized as a source of quality, motivation, inspiration and development for students.

4.2.4 Development of Professional Competence

Agreeing to Law No. 14 of 2005 concerning Instructors and Teachers, proficient competence has capacity to ace subject matter broadly and deeply. It meet with the statement of [13] suggest that professional competence is the various abilities needed to be able to manifest himself as a professional teacher.

In order for the professional competence of the teacher implicated, [14] mentioned that the improvement of teacher competence and professionalism could have done in several ways, including the following:

4.2.4.1 Advanced Study.

Advance study for the Strata 2 Program. Further study for the Strata 2 or Magister program is the first way that teachers can take to improve their competence and professionalism.

4.2.4.2 Courses and Training.

Participation in courses and training on education is the second way that teachers can take to improve their competence and professionalism.

4.2.4.3 Utilization of Journals.

Journals published by professional communities or universities used to increase competence and professionalism.

4.2.4.4 Seminars

Participation in seminars is the fourth alternative that taken to improve the competence and professionalism of a teacher.

5 Conclusion

Based on the depiction over, it can be concluded that capable competence is specialist of the texture broadly and the coherent substance that shrouds the texture, as well as dominance of the structure and coherent method. A educator must ace a least of four (4) instructor competencies, to be specific: (1) educational competence, (2) identity competence, (3) social competence, (4) proficient competence additionally data building competence.

Educates who are in understanding with the conditions of globalization in this progressed time are teachers who are able to pro and control changes that are coherent and inventive. The trademark of a educators is to have the capacity to anticipate, suit and reorient existing enhancements. Anticipating the enhancement of science and development consolidates mental capacities and states of intellect based on certainty and commitment, which in turn leads understudies to a level of dominance and control over ever-changing circumstances.

The efforts that can be made in order to improve professional competence are to provide opportunities for teachers to continue their studies in the Strata 2 Program, attend IT-based courses and training, use journals, attend seminars.
References


Implementation of BOS Reporting Information System Management at SMP Negeri 2 Medang Deras, Batubara Regency

Frans H. Rajagukguk¹, Hottua Samosir²
{frans.rajagukguk53@gmail.com¹, hottuarealy@gmail.com²}

Pascasarjana Universitas Negeri Medan, Fakultas Ekonomi, Universitas Prima Indonesia¹²

Abstract. Management of information systems is a must in all organizations, both non-profit organizations and profit companies. The application of information technology has become a very important part, especially reporting on BOS funds at SMP Negeri 1 Medang Deras, Batu Bara Regency. In 2020 until now, the process of distributing BOS Funds from the Ministry of Education and Culture has been different from the previous year. Where the distribution of BOS funds before 2020, the distribution is done every three months, but in 2020 until now the distribution of BOS funds has changed into 3 stages, namely stage one, stage two and stage three. For this reason, the presentation of financial reports at SMP Negeri 2 Medang Deras, Batu Bara Regency is an important aspect because the reporting must be fast, transparent and according to the specified time. At the time of reporting, recording problems often arise so that reports are late to the Coal Education Office and to the Ministry of Education and Culture because they use the Microsoft Excel application. To overcome this problem, a BOS Reporting System Application was developed at SMP Negeri 2 Medang Deras, Batu Bara Regency. The BOS Reporting System application can be used starting from RKAS Preparation, General Cash Book Financial Reporting, Bank Books, Tax Books, Cash Support Books and Asset and Inventory Reporting.

Keywords: Applications, BOS Reporting

1 Introduction

BOS Financial System Management consists of the words management, finance, and BOS funds. Management can be defined from various points of view. Many management theorists in books and articles on practical management and empirical research define it differently. Boris Kaehler and Jens Grunde in their book HR Governance; A Theoretical Introduction, citing several expert opinions on the definition of management. Fayol (1916:5), management means predicting and planning, organizing, ordering, coordinating, and controlling. Koontz (1961:186), management is the art of getting things done through formally organized people and groups; the art of creating an environment in organized groups where people can appear as individuals but work together to achieve group goals; the art of removing obstacles, the art of optimizing efficiency in achieving goals effectively.

Bovee et al. (1993:5), management can be defined as the process of achieving organizational goals through planning, organizing, leading, and controlling human, physical, financial, and other organizational resource information effectively and efficiently. Schermerhorn (2005:19), management is the process of planning, organizing, leading, and...
controlling the use of resources to achieve performance goals. From several definitions of management, Boris Kaehler and Jens GrundeI argue that management is predicting and planning to organize, to command, to coordinate, and to control organizational goals (Kaehler and GrundeI, 2019:11). According to Istijarti et al. (2019:905); Dufour et al (2020:4), management is a science and art to regulate the process of utilizing human resources and other resources effectively and efficiently to achieve certain goals. Meanwhile, according to Sondang P. Siagian management is a skill or ability to obtain results in order to achieve the goals that have been set (Siagian Sondang, 2015:6). Thus management is a process of achieving goals effectively and efficiently by utilizing existing resources that are carried out together, and in an organized manner.

Finance is an activity of learning how to identify individual businesses, improve organization, allocate, use monetary resources over time, and also calculate risks in carrying out projects (Fitriani, 2014:33). Finance is related to financial reports, the art of calculating, management and recording of reports which are special tools used in evaluating company performance, the performance of organizational activities, investment activities, and financing activities. Consists of three types of financial reports, namely financial reports for management, financial reports for external parties of the company, and financial reports for special parties. The financial statements for the three parties are prepared and presented from the same accounting process, which is a product of an accounting information system (Riswan and Kusuma, 2014:94). The financial report is a summary of a recording process, which is a summary of financial transactions that occurred during the financial year concerned (Baridwan, 2004:17).

One of the funds sourced by the central government is the School Operational Assistance Fund or known as the BOS fund. The BOS Fund is a Central Government program to provide funding for non-personnel operating costs for primary and secondary education units (Permendikbud No. 1 of 2018). According to Fitri Afrilliana (2021:33) School Operational Assistance (BOS) is a program whose function is to fund non-personnel operating costs for basic education units as the implementation of compulsory education programs in the form of cash funds.

School Operational Assistance (BOS) is a grant from the government provided to schools through the process of submitting the School Budget Activity Plan (RKAS). In general, the BOS program aims to ease the public's burden on education financing in the context of quality learning, as well as play a role in accelerating the achievement of Minimum Service Standards (SPM) in schools that have not met the SPM, and the achievement of the National Education Standards (SNP) in schools that have met the MSS. Meanwhile, the objectives of BOS assistance are specifically to: 1) Help provide funding for school operating costs 2) Exempt student fees. 3) Easing the burden of student fees 4) Freeing student fees for parents who cannot
afford the institution, through the process of submitting the School Budget Activity Plan (RKAS) (Kemdikbud, 2021).

Schools as an entity must be able to manage BOS funds in a professional and accountable manner to support quality teaching and learning activities. The BOS funds provided by the government are managed independently by the school through School-Based Management (SBM) (Julantika, 2017:31). This is sharpened by Fattah and Rangono that funds obtained or given by the government, as well as other parties require good management for legal purposes (Nanang Fatah, 2009:57; Rangongo et al., 2016:3). Because management is the most important element in achieving organizational goals. As stated by Husaini that 80% of the achievement of organizational goals is influenced by management (Husaini Usman, 2014:14).

No matter how big the school funds are, if they are not managed with good management, the school will experience a setback. School financial management must meet the requirements of being responsible, accountable and transparent. School financial management must be accountable in accordance with the receipt of funds and the use of funds and can be accounted for before the law. Transparent in the management of funds means that it can be known by the parties concerned. The institution has rules in which only certain parties can be involved in recording financial administration, knowing, understanding and exploring financial administration (Harsono, 2008: 89).

Financial management includes planning, use or utilization, data recording, reporting and accountability activities that are allocated to run schools with the aim of showing financial administration tips so that their management can be accounted for in accordance with applicable regulations (Nadira, 2016:12). Nadira further argues that financial management is important in managing schools/madrasas as a whole, in line with the duties and responsibilities of schools/madrasahs in managing directly the funds for education providers through BOS funds.

The financial statement management model is a model that is applied by an institution/organization in managing or reporting existing funds which it considers a solution to overcome the difficulties that occur (Mukhofifah et al, 2016:16). The following are several models of financial reporting management according to Sudarya (2018: 1-4): (1) Financial reports with handwritten manuals, namely reports made by hand on a special book, the financial report book. The weakness of this model is that it takes a long time to complete the bookkeeping, the accounting framework is less effective and efficient because if an error occurs, you have to start over from the beginning, errors occur in recording transaction data and calculations, it is difficult to organize business transaction data, etc. (2) Financial reports with offline computer manuals, namely making financial reports by recording bookkeeping on paper and then inputting using software such as Microsoft Excel or Spreadsheets, following the existing accounting cycle process and not connected to the internet network.

The weakness of this model is that it is more ineffective because it has to be done twice, namely handwritten and manually typed on a computer, it must require an application to input transaction data through a software system, the coordination system with parties who need reports is still done manually face-to-face so it is still less effective. One of the advantages of this model is that the accuracy of the data will be more guaranteed because it is done twice to minimize errors in calculations. (3) Financial reports online. Online is a term when we are connected to the internet or cyberspace, whether it is connected to our social media accounts, e-mail and various other types of accounts that we use or use via the internet. Online can be done anytime and anywhere because online internet has no time and age restrictions so that everyone can access the internet comfortably. Online is said for internet users who manage to enter the internet network without experiencing a problem. The advantage of the online reporting model is that the coordination system between parties who need reports occurs faster, so that it is more
Factors of effectiveness and efficiency are things that a person considers to take advantage of information technology. The use of the internet and the facilities available on the internet to carry out reporting activities is known as e-financial or online systems. Based on this, it can be seen that the internet has changed several elements of traditional financial reporting. The online-based financial management model is proven to be effective and efficient to use. This is in line with some of Ria's research (2018) in her research title "Analysis of the Application of Android-Based Financial Applications in the Financial Reports of MSMEs in Mekarsari, Depok". This study aims to analyze the application of android-based financial applications on the results of financial reports for Micro, Small and Medium Enterprises (MSMEs) in the Mekarsari area, Depok, West Java. The results of this study showed that in financial recording using the Android Financial Application on smartphones of MSME owners in the Mekarsari area, Depok, it was proven to facilitate business transactions in the form of buying-sales, accounts payable, payment of operational expenses and others, financial reports on Android-based smartphones were easy used at any time. Real time information in this system helps operations move more effectively and efficiently.

The advantages of this online-based financial statement management model are: 1) fast data processing so that recipients of information can immediately make decisions or determine company policies. 2) Has a high level of information so that it can be used as a reference in making company policies. 3) Efficiency of human resources because in the operation of the accounting information system it only takes one person to input data and the next process will occur automatically. 4) Ease of access, so that company leaders can find out the financial position anytime and anywhere.

The weakness of this model is that it requires a strong internet connection in the reporting process and this online-based financial management model requires a better security system because the application is only run centrally, so that if at any time the central server is down, the application system cannot run smoothly. The purpose of this study was to find an online-based BOS fund report management model at SMP Negeri 2 Medang Deras, Batu Bara Regency and to determine the effectiveness of the implementation of the online-based BOS fund management report management model at SMP Negeri 2 Medang Deras, Batu Bara Regency.

2 Research Method

This study uses the type of research and development research (Research and Development). In this study, the type of data implemented was qualitative data which was obtained empirically from the respondents (audience) in Batu Bara regarding the application of the developed BOS Fund Reporting System. The research subject in developing the SIMPEL BOS application system is a teacher at SMP Negeri 2 Medang Deras, Batu Bara Regency. Research subjects were taken by random sampling method. The focus of this research is the application of the SIMPEL BOS application for reporting BOS funds at each stage.

According to Sugiyono (2007:297) research and development methods are research methods used to produce certain products and test the effectiveness of these products. This
research is development research that refers to the Plomp development model. The choice of the Plomp model compared to other models is because in development research according to Plomp (1997) it is necessary to have a suitable design used in solving educational problems. Plomp (1997) characterizes educational design as a method in which people work systematically toward solving the created problems. This model consists of five development phases, namely (1) initial investigation phase (initial investigation), (2) design phase (design), (3) realization phase (realization/construction), (4) test, evaluation, and revision phase. (Test, evaluation and revision), and (5) the implementation stage of implementation (Rohmat, 2012:66-67).

3 Result and Discussion

The results of the study were obtained from the trial process of the SIMPEL BOS application. By referring to the Plomp aspect, the qualitative data obtained is the percentage level. The assessment aspect of the SIMPEL BOS application was obtained from filling out a questionnaire after the trial process was carried out. The evaluation of the SIMPEL BOS application in terms of the appearance and layout of the application, data obtained that 100% assessed that the SIMPEL BOS application was in accordance with its function. In terms of the interactivity of the Website Application, 96% of respondents considered the SIMPEL BOS application to be quite interactive.

The reason is because it can communicate two-way between the Application developer and the Treasurer, this is provided by the Application on the Open Ticket Menu. Meanwhile, 14% considered it to be less interactive on the grounds that they did not understand the SIMPEL BOS application very well. In terms of the availability of menus and facilities contained in the SIMPEL BOS Application, 73% of respondents assessed that the SIMPEL BOS Application had sufficient menus and facilities needed for a BOS Fund Accountability Application. While 17% rate the menu and facilities are still lacking, some expect video tutorials and chat. In terms of operating the SIMPEL BOS Application, 97% of respondents rated the SIMPEL BOS application as easy to operate.

While 14% assessed that the SIMPEL BOS application is still difficult to operate, there are some respondents who are confused about using the application because it is the first time trying it, maybe if you are used to it you will understand. Testing from the side of experts provides input so that it is more interactive, not too simple, made more interesting and attractive. The
reason is that the majority of users are old treasurers, so the graphic design should not be too rigid. The suggestion is to make it more elegant, but still characterize a Finance App.

Apart from the layout and appearance, there are no more comments or criticisms, in general it is good. Aspects of Prospects and Application of SIMPEL BOS Applications at SMP Negeri 2 Batu Bara Regency. In terms of whether the SIMPEL BOS application is suitable for use in SMP Negeri 2 Batu Bara Regency, 98% of respondents stated that this application is very suitable to be applied. The answer was obtained for various logical reasons, including because the preparation of the RKAS was faster, the recording of the General Cash Book, Cash Cash Sub-book, Bank Sub-Book, Tax Sub-Book and Asset and Inventory Reporting was faster and more efficient. In addition, users can also access the SIMPEL BOS Application at any time, which is important when connected to the Internet.

4 Conclusion

The conclusion from the research and the data obtained can be concluded that the SIMPEL BOS application at SMP Negeri 2 Medang Deras can be said to be good. Starting from the appearance, interactivity, and the available facilities already meet the criteria of a good Financial Application. In terms of implementation, the SIMPEL BOS application is suitable to be applied in Batu Bara Regency so that reporting on BOS funds starts from the Preparation of the RKAS, General Cash Book Reports, Cash Cash Sub-Book Reports, Bank Sub-Books, Tax Sub-Books, and Asset and Inventory Reports. The online-based SIMPEL BOS application needs to improve several things, starting from increasing human resources regarding the application of technology and information, especially on the internet and multimedia use.

References

Development of an Online-Based Administration Service Management Information System at SMP Negeri 1 Datuk Lima Puluh Batu Bara Regency

Tobok Luhut Situmorang¹, Hottua Samosir²
{tobokluhuts@gmail.com¹, hottuarealy@gmail.com²}

Pascasarjana Universitas Negeri Medan, Fakultas Ekonomi, Universitas Prima Indonesia¹²

Abstract. The implementation of the Administrative Service Management Information System at SMP Negeri 1 Datuk Lima Puluh is one of the efforts to improve education services. The theoretical basis in this study is a theory related to Information System Management. The purpose of this research is to provide a means for students' parents to use information and communication technology at SMP Negeri 1 Datuk Lima Puluh. The next goal is to find out what products and services are needed by SMP Negeri 1 Datuk Lima Puluh and parents of students in developing E-Service Applications. The method used in this study is the Research and Development (R&D) method but is limited to the model development stage, while the approach used is a descriptive qualitative approach. From the development of the model, this research resulted in a Management Information System application product at SMP Negeri 1 Datuk Lima Puluh Batu Bara Regency. After the system test, the E-Service Application runs well. From the research that has been carried out, it was found that the information system used by the school is still conventional. While in the management of administrative services already using computers but the input is still manual, therefore we need a computer-based application program that can be accessed 24 hours and based online, so as to increase efficiency, transparency, positive responses and services to students, teachers, employees and parents.

Keywords: E-Services, Applications, SMP Negeri 1 Datuk Lima Puluh.

1 Introduction

Implementation of Management Information Systems greatly affects the value of an organization, especially educational organizations. Awareness of the importance of implementing E-Services for education management information systems can provide hope and better solutions in the future. Therefore, education always demands improvement and improvement in line with the increasing needs and demands of people's lives. School as an educational institution is a place or place where the educational process takes place. Schools have complex and dynamic systems. In its activities, the school is a place that is not just a gathering place for teachers and students, but is in a complex and interrelated system structure, therefore the school is seen as an organization that requires management. The rapid advancement of information technology is one of the causes of changes in the education system.

This makes people tend to be directly involved in accessing information technology. Along with the rapid development of information technology, it is hoped that teachers, parents, and even the wider community can easily access and know everything related to school activities,
quickly. Information about these activities is usually obtained at school and at the beginning of the semester only. This means that it will be difficult for parents of students to obtain the desired information anytime and anywhere. Lack of time to supervise children because of their daily activities is also a problem faced by parents, complaints when they want to access information and when they want to meet the homeroom teacher are obstacles and problems in school information services. The availability of good E-Services will greatly support educational activities at an institution.

Management information systems in schools are very important in supporting teaching and learning activities in schools. The school management information system functions as a means used to convey information to students and parents of students. The existence of a management information system can support the smooth running of school administration activities which will ultimately improve the quality of school management. According to the opinion (Ety Rochaety, 2008), education management information system is a combination of human resources and information technology in selecting, storing, processing and making decisions in the field of education. Understanding Education Management Information System is a system designed to provide information to support decision making on management activities (planning, mobilizing, organizing, and controlling) in educational institutions.

Management information system consists of three words with different meanings, each of which has a meaning. To find out the meaning of the three words, the researcher will present in detail as follows, according to the opinion (Hamalik, 1993; Hartono, 2000; Hendayaningrat, 1996). The system is a whole or totality consisting of parts or sub-systems that interact with each other and interact with each other to achieve the goals that have been set. While information is processing data in a form that is more useful and more meaningful for the recipient to describe a real event and can be used to make decisions. While the notion of management is everything related to goals carried out through other people. Through the above understanding it can be ascertained that a management information system in general is a system that provides information that is used to support operating systems, management, and decision making in an organization so as to produce an effective and efficient work environment.

An information system can be defined as a computer-based system that provides information to multiple users with desired needs. According to (Gordon B. Davis, 2002) management information system is a human and machine system that is integrated (integrated) to present information to support the functions of operations, management, and decision making in an organization. Furthermore (Edhy Susanta, 2003), states that information is the result of data processing so that it becomes an important form for the recipient and is used as a basis for making decisions that can be taken directly at that time or indirectly in the future about the organization.

To overcome the problems above, we need an education management information system that is able to provide solutions that are fast, accurate and efficient. One solution to overcome these problems is to create an Android-based education management information system that can be accessed directly by users online without being limited by time and place. A school management information system that can be accessed by everyone via a smart phone or tablet gave the author the idea to create an application for the nation's pillar school management information system, which can provide information about school activity programs for teachers, and parents of students which in the end is an information system. management can improve the effectiveness and efficiency of the nation's pillar schools.
2 Research Method

This study uses the Research and Development method using the Plomp Model. The Plomp model is seen as more flexible than other models. Therefore, the researcher chose to use the Plomp model of research design. The Plomp model consists of five phases or 5 stages, namely: preliminary investigation, design phase, realization/construction phase, and test, evaluation and revision phase, and implementation (implementation). The stages in the Plomp model can be described as follows:

- **Initial investigation phase (preliminary investigation)**
  
  The term "preliminary investigation" is also called needs analysis or problem analysis. Plomp and van de Wolde in Rochmad stated: "In this investigation important elements are the gathering and analysis of information, the definition of the problem and the planning of the possible continuation of the project." Investigation of the important elements is collecting and analyzing information, problem definition and follow-up plan of the project. In this phase, researchers collect data or information contained in the field and identify related problems. This data collection serves to strengthen the background of the problem, research objectives, and benefits. Data was collected by interview, study documentation and observation.

- **Design phase**
  
  In this phase the solution is designed, starting from the problem definition. Activities in this phase aim to design solutions to the problems raised in the initial investigation phase. In this phase, the researcher designs a product in the form of an E-Service Administration Application Design.

- **Realization/construction phase**
  
  Design is a work plan or blueprint to be realized in order to obtain a solution in the realization/construction phase. Design is a written plan or work plan with the format of the point of departure from this stage is the solution being realized or made. In this phase, the basic form of the product is produced as a result of the realization of the design phase.

- **Test, evaluation and revision phase (test, evaluation and revision)**
  
  A developed solution should be tested and evaluated in practice. Evaluation is the process of collecting, processing and analyzing information systematically, to obtain the realizable value of the solution. Based on the data collected, it can be determined which solution satisfactory, and which still need to be developed. This means supplementary activity may be required in the earlier phases and is called feedback cycle. The cycle is repeated until the desired solution is
reached. At this stage, validation activities are carried out to media experts and material experts. Design validation is an activity process to assess whether the product design is feasible and appropriate or not. Design validation activities were carried out by asking several experts in the field of databases and programming to rate or provide comments for the instrument.

e. Implementation phase (implementation)

After evaluating and obtaining valid, practical, and effective products; then the product can be implemented for a wider area. After testing the product is successful and there may be further revisions, then the product in the form of E-Services is applied in a broad scope of educational institutions. In its operation, the E-Services must still be assessed for deficiencies or obstacles that arise for further improvement.

3 Result and Discussion

In the first stage, an analysis of the things needed in this development process is carried out, namely the required system, supporting factors, participants, costs and processing time. To obtain information about the need for a management information system at SMP Negeri 1 Datuk Lima Puluh Batu Bara Regency, observations and interviews were conducted. Researchers conducted interviews with several teachers and employees as well as school principals while observations were made by looking at the available facilities and infrastructure to support development. Based on the observations of researchers, in SMP Negeri 1 Datuk Lima Puluh Batu Bara Regency there are computer operators who specifically handle school information management. The number of computers in SMP Negeri 1 Datuk Lima Puluh consists of 4 desktop PCs and 3 notebooks.

Where 2 desktop PCs are used for teacher administration purposes, and 2 desktop PCs are used for inputting grades, filling out lesson schedules and so on. While the notebook is used by the teacher to teach. The desktop PC at SMP Negeri 1 Datuk Lima Puluh contains Microsoft Office which is used to fill in the schedule of subjects and other school activity programs. Meanwhile, based on interviews and observations made by researchers, the following findings were found: 1) SMP Negeri 1 Datuk Lima Puluh does not yet have adequate technology-based E-Services, up to date and can be accessed in a relatively fast time. E-Services at SMP Negeri 1 Datuk Lima Puluh are managed manually and rely on conventionally managed data.

The bulletin board looks untidy, because there are too many sheets of information (announcement) paper attached, and not proportional to the area of the bulletin board, so the wall becomes a place to paste information (announcements) sheets of paper. Data management is still conventional, so it often creates problems when making reports, in the sense that the data cannot be accessed by other users online. Data management does not meet the CBIS (Computer Based Information System) criteria, so sometimes it causes problems when it is needed. 4) Standard operating procedures for administrative work have not been documented, systematically informed so that sometimes it causes problems. Educational administrative staff still need to be given increased competence related to computer-based office management administration.

Such conditions lead the researcher to conclude that SMP Negeri 1 Datuk Lima Puluh needs an E-Service Application based on technology (android) that can be managed by itself. The existence of E-Services will be very helpful so that if the principal needs the necessary data and information, it can be obtained easily, quickly and precisely. In addition, the system must contain several features such as school profiles, vision and mission, organizational structure,
programs, lesson schedules, daily test schedules, MID test schedules, final test schedules, activity programs, and others.

3.1 E-Service Application Development

An attractive graphic design will provide a positive image for the institution that has the SIM application, will also provide an attraction for users who use it or for people who see it, therefore the graphic design design of this application is made by considering aspects of beauty, using simple colors that not crowded and makes the user's eyes feel comfortable in using it. The explanation of the graphic design application design is as follows: 1. Main Page The main page is the initial display of the SIM application, which consists of several menus such as school profiles, contacts, facilities, teaching staff, schedules, open tickets, semester programs, incoming letters, outgoing letters, comments, videos, testimonials, new student registration, attendance and more.

On this main page, there is also a photo slideshow of the pillars of the nation's students that are made to move automatically, changing views. The School Profile menu contains school information such as school name, school address, school location map, vision and mission, statistical numbers, e-mail, Facebook, school website address, and others.

4 Conclusion

From the results of research and discussion that has been done. So researchers can draw two conclusions, namely conclusions in general and conclusions in particular or in detail. The general conclusion that can be drawn by researchers in developing E-Service Applications at SMP Negeri 1 Datuk Lima Puluh is that in developing a management information system several stages are needed, namely the stage of analyzing information system requirements, planning stages, design or design stages, implementation stages, and evaluation stages.

If this stage is carried out correctly, the E-Service Application created can help, expedite and facilitate the implementation of school administration, teacher administration and the process of teaching and learning activities. And with the availability of the education management information system, the work will automatically be more effective and efficient, so that in the end the education management information system created can be one solution to improve information services at SMP Negeri 1 Datuk Lima Puluh.

While the specific conclusions obtained after carrying out research and development of E-Service Applications at the SMP Negeri 1 Datuk Lima Puluh school are the management
information system run by the SMP Negeri 1 Datuk Lima Puluh School so far it is still conventional, has not fully optimized computer functions, computers are used only for typing and printing, while school information data is still stored in a special binder which is placed on a shelf. SMP Negeri 1 Datuk Lima Puluh requires several supporting tools such as network computers, software requirements in the form of information system software and human resource requirements (HR) in the form of competent IT administrative staff.

With the availability of education management information system services at SMP Negeri 1 Datuk Lima Puluh, it is hoped that it will make it easier for parents to find out all information on school activities and can also be an opportunity to increase competitiveness in the surrounding environment. Recommendations Based on the conclusions above, some suggestions that can be submitted are to improve the quality of school services, one solution that can be used is to develop an education management information system in the form of an integrated application. In developing an education management information system at SMP Negeri 1 Datuk Lima Puluh, it must be based on a system development method consisting of planning, analysis, design or design, implementation and evaluation stages. Prepare HR to manage the management information system application.

Provide information services that users need in an updated or current manner. Encourage teachers and parents to take advantage of the education management information system application that has been created. Make rules or procedures related to the use of the education management information system of SMP Negeri 1 Datuk Lima Puluh. Furthermore, suggestions for teachers and parents of students can take advantage of the existing E-Service Applications to support the smooth running of school activities. Actively participate in the development of management information systems according to their functions and roles. Provide constructive input for the development of the E-Service Application for SMP Negeri 1 Datuk Lima Puluh in the future.

References

Microprocessor Practicum Module Development Using ASSURE Model

Marwan Affandi¹, Amirhud Dalimunthe², Eka Dodi Suryanto³
{mr1.affandi@gmail.com¹, amirhud@unimed.ac.id², ekadodisuryanto@gmail.com³}

Universitas Negeri Medan, Medan, Indonesia

Abstract. The design of this microprocessor practicum module uses the ATmega2560 microcontroller and several input output modules. The development procedure adapts the ASSURE model. The stages of developing the ASSURE model include: Analyze learner, State Objectives, Select Methods Media or Material, Utilize Media and Materials, Require learner's participation, and Evaluate and Review. The design of the practicum module consists of Block Input, Block Process and Block Output. Block Input consists of a Thermocouple module, Camera, Voltage Sensor, Temperature Sensor, Keypad, Potentiometer, LDR, Current Sensor, Infrared Counter, Touchscreen and Rotary Encoder. The Process Block consists of Atmega2560 Microcontroller and RTC + EEPROM as memory. Block Output consists of DC Motor, Stepper Motor, Relay, Traffic Light, Servo Motor, LED, LED Dot Matrix, Seven Segment and LCD modules. This study aims to develop a device in the form of a microprocessor practicum module and its guidelines.

Keywords: Microprocessor, Practicum Module, ASSURE Model

1 Introduction

Education is a process carried out by humans to seek knowledge and experience. Education in the process involves many elements, both in terms of education personnel and facilities and infrastructure that support the continuity of education. In improving the quality of education and learning, educational institutions are an important means of making it happen[1]. Improvements in the quality of learning which are based on reflection activities on the implementation of a subject substantively are carried out through process improvement programs, including the application of applied strategies so that students have both knowledge and experience after studying a learning material[2]. Improving the quality of education can be done by improving the quality of learning[3].

There are two elements that affect the teaching and learning process, namely teaching methods and learning media[4]. These two aspects are interrelated, the selection of certain teaching methods will affect the media used[5]. Learning media is a means that can support the achievement of learning objectives. The use of instructional media in the teaching and learning process can generate motivation and stimulation of learning activities, and even have a psychological influence on students[6]. The use of instructional media in the teaching and learning process can generate new desires and interests, generate motivation and stimulation of learning activities, and bring psychological influences to students. The use of learning media in educational institutions varies, including learning media in the form of power points, demonstration tools and trainers[7].
The development of the practicum module is made based on the needs of students, as well as from the problems faced by students based on observations. So that the modules are developed according to the needs of students in order to achieve learning objectives and in accordance with the curriculum used. The development of media in the form of practicum modules is expected to increase the enthusiasm of students to learn independently and improve their thinking skills[8].

To obtain maximum learning outcomes, a synergy is needed between lecturers, the material presented and the learning media. Learning devices used in practicum also give greatly support for student understanding. For example, in the microprocessor practicum courses. This course requires a complete microprocessor practicum module in order to increase student competence. However, at the Microprocessor Laboratory of the Department of Electrical Engineering Education, UNIMED, the facilities and infrastructure have not met the competency needs of graduates yet[9].

Based on the results of observations and interviews conducted, problems were found, among others, the modules and components used tended to be old and partly damaged. In addition, the use of the previous practicum module was not equipped with a user manual, so the practicum was not carried out as expected. This happens because the practicum material is not aligned with the availability of equipment that will be used by students[10].

Based on the description of the problem above, it is necessary to design a practicum module to support microprocessor practicum activities that are complete and in accordance with the curriculum material. The development of learning media requires a development procedure. A development procedure is a procedural step that a developer must take to arrive at a specific product. The media development procedure includes several stages, namely the preparation of design, production and evaluation of media[11].

The design of this practicum module uses a microcontroller and several separate modular input outputs. The microcontroller was chosen because it has almost the same architecture as the microprocessor, so that the material contained in the practicum module can be adjusted. The development of this practicum module is expected to increase the enthusiasm of students to learn independently and improve their thinking skills[8].

Microcontrollers are now widely known and used in the industrial world. Lots of research or student projects that use various versions of microcontrollers that can be purchased at relatively low prices. This is due to the mass production carried out by chip manufacturers such as Atmel, Maxim, and Microchip. The microcontroller itself is known as a sub-system of the computer system which is a combination of semiconductors packaged in one IC or often referred to as a chip, so it is known as a Single Chip Microcomputer[9].

Microcontrollers and microprocessors have the same working system, namely as controllers. Microcontrollers can be called small controllers because complex electronic components such as transistors, TTL ICs and CMOS can be minimized, centralized and controlled using a microcontroller. By using a microcontroller, the electronic circuit becomes simpler because the system can be more easily changed according to user needs or modification. It can be said that a microcontroller is a chip or micro-small size of a computer because there are parts that are directly used, including analog to digital conversion (ADC), analog to digital conversion (ADC), serial and parallel ports, comparators, and so on, only components use an uncomplicated minimum system[12].
2 Research Method

This research is included in the types of research and development methods (Research and Development). Meanwhile, to test the effectiveness of the resulting product, it is necessary to develop the product so that it can be used by the wider community[13]. The development of this practicum module is a product produced for the world of education. The validity and reliability of these products must be tested for their effectiveness in order to achieve learning objectives and competence of graduates according to the curriculum.

The development model adapted in this study is the ASSURE model. The ASSURE model is a class-oriented development model. The ASSURE model was developed by Sharon Smaldino, Robert Heinich, Michael Molenda, James Russel by publishing the book Instructional Technology and Media for Learning. The book emphasizes the implementation of technology and media to facilitate effective learning. The ASSURE model has a constructivist philosophical approach, behaviorism and cognitivism so it is relatively easy to implement and can be easily developed by every educator[14].

This research and development is a procedural model, which is a model that is descriptive and outlines the steps of development. Research & Development research design is a study that produces or develops the design of a product which is then validated by experts or experts and tested on students after the product is revised to get the final product. There are several development procedures proposed by several experts. One of them is the development research procedure proposed by Sugiyono[13].

In this research, the product to be produced is a microprocessor practicum module. After the product is produced, further development is carried out to see the effectiveness and benefits of the product when used. The development procedure that was adapted in this study is the ASSURE model. The advantages of the ASSURE Model include 1) it is simpler and easier to implement by each educator; 2) this model can be planned and implemented in a relatively short time; 3) components that are complete enough to design the implementation of learning; 4) students are actively involved in learning; 5) media selection has a special place in the ASSURE model[14]. The stages of developing the ASSURE model include Analyze learner, State Objectives, Select Methods Media or Material, Utilize Media and Materials, Require learning participation, and Evaluate and Review[15].

In this study, the design of the practicum module consists of three major parts, namely Block Input, Block Process and Block Output. In the Block Input section, there are several components that function as input to the system, including the Thermocouple module, Camera, Voltage Sensor, Temperature Sensor, Keypad, Potentiometer, LDR, Current Sensor, Infrared Counter, Touchscreen and Rotary Encoder. The Process Block consists of Atmega2560 Microcontroller and RTC EEPROM as memory. The Output Block consists of a DC Motor, Stepper Motor, Relay, Traffic Light, Servo Motor, LED, LED Dot Matrix, Seven Segment and LCD module.

In this study, the instruments used were the media feasibility assessment sheet for the validator which included material experts and media experts, as well as a media use test sheet
by lecturers and students. There are three types of instruments that will be used in this study, namely the Material Expert Assessment Instrument, the Media Expert Assessment Instrument and the User Assessment Instrument. The data analysis technique used in this research is a simple qualitative descriptive analysis technique, which describes the results of product development in the form of an electrical engine module.

3 Result and Discussion

Based on the needs analysis of the achievements results, the graduates and the learning outcomes of the courses as well as the availability of supporting tools for practicum in the laboratory, a microprocessor practicum module was developed to support the competence of graduates of the Electrical Engineering study program. The design of the microprocessor practicum module is carried out using the ASSURE model. There are 6 steps that must be done in developing the microprocessor practicum module.

Phase 1 is to analyze students. When the research team made observations, they saw the implementation of practicum in the laboratory that students were less enthusiastic about participating in learning and did not focus on the practical instructions that were delivered. Stage 2 is formulating learning objectives or competencies to be achieved. At this stage, the research team selects material according to the characteristics of the Electrical Engineering study program graduate and competency demands.

The third stage is to choose the strategy, method, material or subject matter needed for the manufacture of products such as: the main material and supporting aspects (text, images, animation, audio, and video). The researcher developed the supporting media for the practicum in the form of a microprocessor trainer using the ATMega 2560 microcontroller. In developing the microprocessor practicum module, the researcher designed a practical implementation guide in the form of a job sheet.

Stage 4 is the phase of implementing Technology, Media and Materials. The implementation of the developed media is aimed at lecturers and students as practitioners. Before the module is used in practicum implementation, the product developed must be validated by material experts and media experts. The media validation developed contains an assessment from the experts from the point of view of the learning media and the material prepared. Product validation was carried out by 3 media experts and 3 material experts.
Then 10 (ten) students were also asked to provide responses related to media developed through questionnaires and interviews. Stage 5 is developing the role of students, namely students as practitioners. The main purpose of learning is so that students can play an active role in the teaching and learning process, especially during practicum implementation. The participation of students in the class, active student involvement shows whether the media used is effective or not. Learning should be designed to create activities that allow students to apply knowledge and receive feedback on the appropriateness of their efforts before and after learning. This stage has not been carried out because the microprocessor practicum module is still under development.

According to the evaluation data of media experts, the average is 89.4. Then use this value as a reference to determine the feasibility of the module. From the calculation and value conversion results, it can be said that the developed practical modules belong to a very feasible category. These results show that the internship module can be used as a medium for practicum learning. The assessment of materials experts includes four aspects, with an average value of 90.3. Perform feasibility testing to determine the feasibility level of the materials included in the practicum module. According to the calculation and value conversion, the results show that the materials in the developed module belong to a very feasible category. These results indicate that the materials developed in the practical modules fit the curriculum and the competencies to be achieved.

User trials were also conducted to obtain feedback. The experiment was conducted with ten students participating in digital engineering practice activities. Each student will receive a questionnaire to evaluate the feasibility of developing modules from the user side. After calculating the average value, the user trial average value is 89. Then perform calculations and conversions to determine the feasibility of the module in practice. The calculation results show that the developed module is in good condition.

4 Conclusion

The results show that the developed practice module is very suitable for digital engineering practice activities. In addition, it is necessary to develop other practical support facilities, such as trainers. Practical support tools in the form of logic gates with 3 inputs and 4 inputs are not yet available. Due to limited support tools, some experiments have not yet been completed.

References


Variety of languages on the status of Facebook users

Abd.Syakur¹, Ridwin Purba², Desy Chaniago³, Herman⁴, Sardjana Orba Manullang⁵, Mas'ud Muhammadiah⁶
{syakurabdm@gmail.com¹, ridwin@ymail.com², dhephoy02@gmail.com³, herman@uhn.ac.id⁴, somanullang@unkris.ac.id⁵, masad.muhammadiah@universitasbosowa.ac.id⁶}

STKIP PGRI Sidoarjo¹, Simalungun University, Pematangsiantar², Mitra Bunda Health Institute, Batam³, HKBP Nommensen University, North Sumatra⁴, Krisnadwipayana University, Jakarta⁵, Primary Education PPs Bosowa University, Makassar⁶

Abstract. Research on the variety of formal languages in social networking sites Facebook and is a study that provides new knowledge about the development of Indonesian used. In accordance with the nature of language, language is dynamic and can develop. The purpose of this research is to describe the variety of languages in terms of formality in Facebook user status and describe the variety of languages in terms of usage in Facebook user status. This form of research uses qualitative approaches to methods in this research and the methods used are descriptive methods of data collected in the form of words, images and not numbers. Based on the results of research conducted it can be concluded that there are, variations in language in terms of usage there are five examples of words that show the existence of characteristics or forms in the field of education, three examples in the field of literature, two fields of medicine, one in the field of religion. In addition, there is also a variety of languages in terms of formality consisting of a variety of businesses, relaxed varieties, and familiar varieties. In addition to getting informal words, the results of this study also revealed the use of informal language variations. The unaradishness of the word used, errors resulting from inappropriate placement of words, diction errors, words that experience errors due to their formation.

Keywords: Language; Facebook; User

1 INTRODUCTION

Many scientists speak and define this language understandably because of the Latin Greek era, with the famous figure Aristotle, people already talking about it. But more people don't pay attention to what language is, because language is integrated with us, just as we never pay attention to our own breath. The Greeks, whose influence has been considerable until now, regarded the language as a human tool for expressing his thoughts and feelings. This limit is true, but not entirely, because it gives the impression that new people speak if there are thoughts and feelings that they want to express. What is forgotten is that language can also affect the mind.

The view arises from structural linguistics with Bloomfield that language is a system of arbitrary sounds used by members of society to connect and interact. Yunus and Erni susilawati (2017) stated that "Language is a communication tool that allows to change with the times, both in terms of meaning and form of the word[1]–[4]. Language plays an important role in human life, not only used in everyday life but also needed to carry out all the activities of human life, such as research, counseling, preaching, even to convey thoughts, views and feelings. Because
only with human language can we communicate everything[5]–[9]. Language is not the only tool of human communication, but it is also known as sign language, symbols, codes, and sounds that will all be meaningful after being translated into human language. Therefore, it is not excessive if language is called the most important communication tool. Based on the background, the focus of the research in this study is "Language Variety On Facebook User Status". As for the sub-issues specifically focused on this research as follows: How is the variety of languages in terms of formality in Facebook user status? What is the variety of languages in terms of usage in Facebook user status?

Literature Review

The terms in Indonesian, the same as the language, in English, Taal in Dutch, Sprache in German, Lughtun in Arabic. These terms, each of which has its own aspect, in accordance with its usage, to mention a cultural element that has a very broad aspect, so that it is a concept that is not easily defined. Thus language is used by man with all the activities of life, because language is the most essential thing in human life. states "Language is an arbitrary system of sound symbols used by society to cooperate, interact, and identify themselves[10]–[12].

Sociolinguistics as one of the branches of linguistics that studies language and its relationship in its use in society. This means that sociolinguistics view language first of all as a social system and communication system, as well as being part of a particular society and culture. Joshua A. Fishman in Pateda (1987:3) argues that "sociolinguistics is the study of the characteristics of language varieties, the characteristics of their functions, and the characteristics of their speakers as these three constantly interact, change and change one another within a speech community." The meaning of the quote is that sociolinguistics are the study of the characteristics of language variation, its functions, and its speakers because these three elements are always interacting, changing, and changing each other in a speech society[13].

Sociolinguistics is not just a "mixed" discussion between language and sociology or other social sciences, but also covers the principles of every aspect of life related to social and cultural functions. In a Sociolinguistic view, language is not only seen as an individual symptom, but a social symptom. As a social symptom, language and language usage are not only determined by linguistic factors, but also by non-linguistic factors that affect the use of language, namely social factors (social status, education level, age, economic level, gender and so on).

Facebook is a social networking service launched in February 2004, owned and operated by Facebook, Inc. As of September 2012, Facebook has more than one billion active users, more than half of whom use mobile phones. Users must register before they can use the site. After that, users can create a personal profile, add other users as friends, and exchange messages, including automatic notifications when they update their profile. In addition, users can join groups of users with similar interests, be sorted by workplace, school or college, or other traits, and group their friends into lists like "Coworkers" or "Close Friends".

Facebook was founded by Mark Zuckerberg along with his roommate and fellow Harvard University students Eduardo Saverin, Andrew McCollum, Dustin Moskovitz and Chris Hughes. Membership of this website was initially limited to Harvard students only, then expanded to other colleges in Boston, the Ivy League, and Stanford University. The site slowly opens up to students at other universities before it opens to high school students, and finally to everyone who is at least 13 years old. Even so, according to a May 2011 Consumer Reports survey, there are 7.5 million children under the age of 13 who have a Facebook account and another 5 million under 10 years old, thus violating the site’s terms of service. A January Compete.com study ranked Facebook as the most widely used social networking service by
monthly active users worldwide. Entertainment Weekly placed him on its late-decade "best" list with the comment, "How do we stalk our ex-lovers, remember our coworkers' birthdays, interrupt our friends, and play Scrabulous before Facebook was created?" Quantcast estimates Facebook had 138.9 million monthly visitors in the U.S. as of May 2011.

METHOD

The method used in this study is a descriptive method of data, in this study the Form of Research uses a qualitative approach to data in this study of written language in the form of lingual units, namely words and sentences on the status of Facebook users. Research data is collected and analyzed to serve as a basis for conclusion withdrawal in research. Based on the opinion of the experts above it can be concluded that the data is the result of recording researchers, both in the form of facts in the form of information that will be selected as analytical material in a study. In the focus of this study researchers use data derived from literature review, recording techniques and photography. Data Collection Tool. (Figure 1)

![Interactive Model](https://via.placeholder.com/150)

**Figure 1. Components in Data Analysis (Interactive Model) Model Miles And Huberman**

(Sugiyono, 2014: 247).

RESULTS AND DISCUSSION

Language variation is the diversity of languages due to certain factors. Thus, language variation is a form used as an alternative to replace the original, beginning, or standard. In other words, variation occurs when there is social interaction between speakers that are not homogeneous, express "The language becomes diverse and varied (Note: the term variation as the English equivalent variety is not variation)". The occurrence of diversity or variety of this language is not only caused by its speakers who are not homogeneous, but also because the social interaction activities they do are very diverse. Every activity requires or causes the diversity of that language.

This diversity will be increased if the language is used by a very large number of speakers, and in a very large area. Language variation occurs as a result of social diversity and diversity of language functions. If the speakers of the language are a homogeneous group, whether ethnic, social status or employment, then variation or diversity does not exist, meaning
that the language becomes uniform. Both variations or varieties of languages already exist to fulfill their function as a means of interaction in diverse community activities. Researchers will present the findings of the study.

Language variations in terms of formality in the above data in terms of frozen variety, formal variety, business variety, casual variety, and familiar variety. In addition to obtaining informal words, the results of this study also revealed the use of informal language variations in students’ short messages such as incompetence of words used, errors resulting from inappropriate placement of words, diction errors, the use of appropriate capital blows. The official style or variety of use in the language on facebook user status can be said to be very rare. The character of the language used is very short so that it is a consideration of the use of this service to further streamline the use of letters in sentences.

The findings obtained in the status of facebook users that, although the language is abbreviated briefly, but if transcribed it can produce an official (formal) sentence. So, it can be concluded that if the sentence contained in the status of the facebook user is transcribed as stated under the authentic data, then the sentence contained in the status of the facebook user has an official sentence. A consultative style or variety of endeavor is a variation of language that is prevalent in regular school, or results-oriented or production-oriented speech. Questions that refer to academic results are the final assignment of students. Variations in terms of usage that most visible characteristics are in terms of vocabulary. Each area of activity usually has a special vocabulary that is not used in other fields. For example, language in literary works usually suppresses the use of words aesthetically so that the right vocabulary is chosen and used. Data 15 facebook user statuses use words that give rise to a beautiful rhythm when read that are poetic and aesthetic. Variations in terms of its use in the field of education. Data 16 describes the variety of languages in the field of education.

Conclusion

Based on the results of the research conducted, it can be concluded that there are language variations in terms of usage, there are five examples of words that indicate the characteristics or forms in the field of education, three examples in the field of literature, two in the field of medicine, one in the field of religion. In addition, there are also variations in language in terms of formality, which consist of a variety of business, a variety of casual, and a variety of familiar. In addition to getting informal words, the results of this study also reveal the use of informal language variations. Non-standard words used, errors caused by inappropriate word placement, diction errors, words that experienced errors due to their formation.

References


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