Developing Project-Based Learning for Social & Sciences Teaching Modules to Increase Learning Motivation at Smk Center of Excellence

Tanti[1], Burhan Eko Purwanto[2], Beni Habib[3],Basukiyatno[4]
{ tanti750729@gmail.com}

Postgraduate Program, Master of Pedagogy, Universitas Pancasakti Tegal, Indonesia

Abstract. The purpose of writing this article is to find out the feasibility of developing a Teaching Module for the subject of the Natural and Social Science Project that can increase learning motivation in class X students of smk Center of Excellence. This type of article is a conceptual analysis using the Risearch and Development method referring to the Borg & Gall model. The initial trial subjects were 1 class, the 2-class field trial subjects that had not been treated in the initial trials and the operational field trial subjects consisted of 3 classes. The results of the study are in the form of modul ajar which is made in several stages: (1) Analyzing learning outcomes, (2) elaborating learning objectives and the flowof learning goals from learning outcomes, (3) pouring the flow of learning objectives into teaching modules, (4) testing relevate the teaching module to the Expert Team, and (5) pilot the teaching module. The results obtained are decent teaching modules according to material experts and experts in learning with good categories. The teaching module is considered effective because in data analysis with a t-test on the motivation of learners as much as ..... is greater than t table so it shows there is a significant difference between learning that uses the development of teaching modules and those that use teaching modules without development.

Keywords: Development, Project-Based Teaching Modules, Motivation, Sciences

1. Introduction

According to [1] The fusion of physics, chemistry, biology and social studies which are now merged into the subjects of Project Social & Science (PIPAS) includes the integration between social sciences and natural sciences which includes s all aspects of social life in diversity, religious diversity, and cooperation covered in social sciences. The interaction between man and nature, as well as seeing various phenomena that occur with nature, can be explained logically and scientifically with natural sciences. The combination of natural sciences and social sciences allows us to utilize the wealth of natural resources wisely and wisely. The learning process of the IPAS Project can be successful if there is good planning in making learning tools.

Decree Director of Education Vocation Minister Education number 22/d/o/2021 concerning Penetapan Sekolah Menengah Kejuruan Pelakana Program Sekolah M enengah Kejuruan Pusat Keunggulan in 2021 phase I SMK Center of Excellence (SMK PK) lists SMK Negeri 1 Adiwerna as one of the PK Vocational Schools in Tegal Regency, oleh therefore the curriculum used must follow the curriculum of the Center of Excellence school.

In the Curriculum of the Center of Excellence School, the learning process in the form of teaching modules, is made with the following flow: (1) The existence of Learning Outcomes that have been prepared by the Ministry of Education and Culture, (2) From the existing learning outcomes, a lesson is made (TP) and alur t ujuan pembelajaran (ATP) , and (3) From ATP is compiled Teaching Module. The teaching module includes a Pancasila Student Profile that is included in the learning objectives and learning activities. At the SMK level, the IPAS Project project prioritizes the application of project-based skills that support vocational materials, but is still adjusted to the conditions of each school.

The Project-Based learning model in the subject of the IPAS Project encourages teachers to always be a motivator that can influence students in doing learning activities. In the school curriculum of the Center of Excellence which emphasizes learning using the Project Based Learning learning model , it hopes to increase understanding of the material by applying it to the competencies taken by each student in each department in real terms. This is because the Project Based Learning learning model is a learning that in its presentation relates things that happen in daily life in the surrounding environment. . The reality in the field is that teachers still have difficulty in compiling teaching modules, because in addition to the emphasis on using innovative 21st century learning tools, they are also required to use a project-based learning (PjBL) learning model.

Lack of student learning motivation can result in learning achievement. This can be seen from the attitude of students when participating in limited online and face-to-face learning activities. For example, When teachers explain the material they are reluctant to listen and When given assignments Most are late collecting them. Some learners are unable to answer dengan questions either when the teacher gives the questions. As explained by Husnul Abadi (20 21) that motivation is the impulse that arises in a person consciously or unconsciously to perform an action with a specific purpose. Fostering learning motivation is very important so that learners can achieve the desired goal of having good achievements in their learning . From the reasons above , a teaching module is needed as a learning plan that can foster motivation and at the same time can improve student achievement.

Some of the problems that will be studied in this studyare other: whether project-based learning-based teaching is effectively used in class X students of SMK Center of Excellence and how Project Based Learning-based teaching modules can improve the learning motivas of class X students of SMK Center of Excellence at SMK Negeri 1 Adiwerna school year 2021/2022?

2. Literature Review

A teaching module is a number of tools or media tools, methods, instructions, and guidelines that are systematically and interestingly designed. The teaching module is an implementation of the Learning Objectives Flow which is developed from Learning Outcomes with a Pancasila Student Profile as the target. Teaching modules are arranged according to the phase or stage of development of the learner, consider what will be learned with the learning objectives, and are based on long-term development. The teaching module created is expected to assist teachers in carrying out the teaching and learning process so that the achievement of learning objectives in the Center of Excellence Curriculum reaches the maximum. One of the project-based materials that can increase learning motivation is theme 2 about "The Impact of Information Technology Advances on Secondary Formal Education". Project-based teaching modules to increase learning motivation are still simple and whose form of development does not yet exist, so it will be very useful and can be used to meet the needs of PIPAS teachers in class X.

Teaching modules as an implementation of the learning objectives flow developed from learning outcomes. Teaching modules are developed based on learning flows and objectives. Education units can compile, create, select, and modify teaching modules according to the characteristics of the region, educator units, and students. Further provisions regarding the flow and objectives of learning, as well as the development of teaching modules are regulated in the guidelines set by the leaders of the main units in charge of curriculum, assessment, and books.

The Teaching Module contains learning activities as a process of interaction between students and educators and learning resources in a learning environment. The principles of learning in the Natural and Social Sciences project are as follows:

a. Learning is designed by considering the current stage of development and level of achievement of learners, according to learning needs, and reflects the character and development of diverse learners so that learning becomes meaningful and fun.
b. Learning is designed and implemented to build the capacity to be lifelong learners.
c. The learning process supports the development of competencies and character of students in a sustainable and holistic manner.
d. Relevant learning, namely learning that is designed according to the context, environment, and culture of students, and involves parents, the world of work, and the community as partners.
e. Sustainable future-oriented learning

According to [2] since a long time ago the problem of education in Indonesia has never been endless (everlasting problem). Discourse and discourse are always there, but implementation on the ground is determined by policyholders. As a result, achievements that have not been optimally implemented have been new things that must be offered. So that the burden on the world of education of the Indonesian nation is getting heavier. In learning,there is a breakthrough that is able to answer the disruption, the concept of Technological Pedagogical and Content Knowledge is an integration of three different elements, namely technology, pedagogy and knowledge content. So that the project-based teaching module that will be

applied in the Center of Excellence school specifically for the IPAS Project subject uses the TPACK approach. In this learning activity, what is intended is a combination of learning outcomes involving internet media, communicationand electronics in learning even though it is carried out with simple means.

In PIPAS subjects, Learning Outcomes are interpreted as goals / competencies that must be achieved by students in accordance with the phase or stage of development. In the subject of the Natural and Social Science Project, the learning outcomes that will be given in the second semester are all domains in theme 2, namely the Impact of Information Technology Progress on Secondary Formal Education. The domains on theme 2 include: Spatial and connectivitybetween space and time, Domains of Interaction, Communication, Socialization, Socialization, Social Institutions, and Social Dynamics. Domain of Behavioral Economics and Well-being

A teaching module is a number of tools or media tools, methods, instructions, and guidelines that are systematically and interestingly designed. The teaching module is an implementation of the Learning Objectives Flow which is developed from Learning Outcomes with a Pancasila Student Profile as the target. Teaching modules are arranged according to the phase or stage of development of the learner, consider what will be learned with the learning objectives, and are based on long-term development. Teachers need to understand the concepts of teaching modules so that the learning process is more interesting and meaningful.

Teachers in educational units are given the freedom to develop teaching modules according to the context of the environment and the learning needs of students. The teaching module is equipped with components that are the basis for the preparation process. Komponen teaching modules in the guide are needed for the completeness of learning preparation. Teaching module components can be added according to subjects and needs. The components of the Teaching module include:

1. General Information
a. Module Identity

Information about the developed teaching module consists of:
1) Name constituents, institutions, and years of compilation
2) School level (SD/SMP/SMA)
3) Classes
4) Time allocation (the determination of the time allocation used is the allocation of time according to the class hours applicable in the respective work units)

b. Initial Competence

Initial competencies are the knowledge and/or skills that students need to possess before studying a particular topic. Initial competence is a measure of how deeply a teaching module is designed.

c. Profil Pancasila Students

It is the ultimate goal of a learning activity that is closely related to the formation of the character of students. Pancasila Student Profile (PPP) can be reflected in the content and/or learning method. In the learning module, the Pancasila Student Profile does not need to include it in its entirety, but can choose a Pancasila Student Profile that is in accordance with the learning activities in the teaching module.

The six dimensions of the Pancasila Student Profile are interrelated and integrated in all subjects through (clearly seen in): material/subject content, pedagogy, and/or project or assessment activities Each teaching module contains one or more elements of the pancasila student profile dimensions that have been set.

d. Infrastructure

It is the facilities and materials needed to support learning activities. Facilities refer to the tools and materials used, while the infrastructure in them includes materials and other relevant sources of teaching materials used in learning activities. The availability of material is advisable considering the needs of learners either with limitations or advantages. Technology, including facilities and infrastructure that are important to pay attention to, and is also utilized for deeper and more meaningful learning.

e. Target Learners

The targeted students are; 1) Regular/typical learners: general, there is no difficulty in digesting and understanding the teaching material. 2) Learners with learning difficulties: have a learning style that is limited to only one style for example with audio. Have difficulties with language and understanding of teaching materials, lack of confidence, difficulty concentrating long-term, etc. 3) Learners with high achievement: digest and understand quickly, are able to achieve high-level thinking skills (HOTS), and have lead skills.

f. Learning Model

It is a learning model or framework that provides a systematic picture of the implementation of learning. Learning models can be in the form of face-to-face learning models, distance learning in the network (PJJ Online), distance learning outside the network (PJJ Offline), and blended learning.

2. Core Learning
a. Learning Objectives

Learning objectives must reflect the essentials of learning and must be testable with various forms of assessment as a form of show of understanding. Learning objectives determine learning activities, resources used, suitability for student diversity, and assessment methods used. Learning objectives can be of various forms: knowledge in the form of facts and information, and also procedural, conceptual understanding, thinking and reasoning skills, and collaborative and communication strategies.

b. Meaningful Understanding

Meaningful understanding is information about the benefits that learners will gain after following the learning process. These benefits can later be applied by students in their daily lives.

c. Warming Up

Lighter questions are created by teachers to cultivate curiosity and critical thinking skills in learners. Lighter questions guide students to gain meaningful understanding according to the learning objectives.

d. Learning Process

The sequence of core learning activities in the form of concrete learning activity steps, includes alternative options / learning and steps to adapt to the learning needs of students. The steps of learning activities are written sequentially according to the planned time duration, including three stages, namely the introduction, core, and closing based on active learning methods.

e. Assessment

      Assessment is used to measure learning outcomes at the end of the activity. Achievement criteria must be clearly determined in accordance with the established learning objectives. Types of assessment: 1) Assessment before learning (diagnostics) ; 2) Assessment during the learning process (formative) ; 3) Assessment at the end of the learning process (summative). The forms of assessment that can be done: 1) Attitudes (Pancasila Student Profile) can be in the form of: observation, self-assessment, peer assessment, and anecdotal. 2) Performance (presentations, plays, exhibitions of works, journals, etc.) 3) Written (objective test: essay, multiple choice, fill in, short answer, right-wrong).

f. Pengayaan and Remidial

      Enrichment is a learning activity given to students with high achievements so that they can develop their potential optimally. Remedial is given to learners who need guidance to understand the material or repeat learning. When designing enrichment activities, it is necessary to pay attention to differentiation for example learning sheets / activities

3. Method

      According to [3] jenis this research is research and development (Research and Development). This model of development in research and development follows the de- sain of [4] which isself-contained over 10 steps. The steps are: (1) collecting information and conducting research and information collecting; (2) planning (planning); (3) development of a preliminary form of ct product; (4) preliminary trial (preliminary fi eld testing); (5) revision of the test results (main product revision); (6) field trials (main field testing); (7) revisi product results of fieldtrials an (operational produ ct revision); (8)operational field testing; (9) revision of the final product (final product revision); dan (10) dissemination and implementationof dissemination (dissemination and implementation). Thedeveloped product pro is a teaching module. In the first semester, preliminary studies and product developmentin the form of teaching modules were carried out. In the second semester, product trials were carried out in class X DPIB 2. The next two weeks field trials were carried out in class X DPIB 1 and X TK 3 and the next two weeks trials were carried out in class X TM 3 and class X TO 2. Product trials in development research aim to perfect the product by practicing it directly in the field. The trials were carried outthrough the following stages: (1) initial products (validasi expert material, validation of teaching teachers and evaluation); (2) initial trials (small group trials using the single one shot study method); (3) field trials (field trials using the one group pretest-postest method); and (4) field tests (field tests with Quasi-experimental methods). The subjects in the study were class X students of SMK Negeri 1 Adiwerna. The small group trial subjects in class X DPIB 2 totaled 18 students, because at that time it was still limited face-to-face with the blanded Learning learning model . The field trial subjects in class X DPIB 1 and X TK 3 were 36 students. The field test used classes X TM 3 and X TO 1 sift 1 as the control class of 36 learners and X TM 3 and X TO 1 sift 2 as to the experimental weld of 36 learners. For data collection, several instruments were used, namely observation with product assessment guidelines to obtaindata on the validity of teaching modules from material experts and learning experts. Validation sheets are used to determine the effectiveness of the project-based teaching modules produced. After the effectiveness was obtained, the study continued to use a rating scale that aimed to observe the motivation that appeared in students in the learning process. This rating scale uses a likert scale with five scale criteria. This observation work was carried out during field trials, and the interview instrument

test was also used to complete the data obtained from the observation. These instruments are used at the stage of research and preliminary information collection as well as field tests.

[3] states that for the purposes of quantitative analysis, the answers are scored with criterion 5 for excellent criteria, a score of 4 for good criteria, a score of 3 for criteria is good enough, a score of 2 for criteria less and a score of 1 for criteria is very lacking. The interview used is a closed interview to obtain information and explanations from the research subject. The results of the assessment of the collected observation items are calculated as the average score.

Theimplementation of the kuriculum of the center of excellence school and the problems related to the application of the kuriculum of the center of excellence school need to be carefully studied. At the field test stage, this instrument is used to obtain opinions from teachers regarding the suitability of project-based teaching modules with the expectations of teachers and schools of center of excellence. The questionnaire instrument is used to obtain teacher responses to assess the effectiveness of the products developed and student responses to obtain data on students' opinions about the learning process experienced. The determination of the score is made on a scale of five.

The data analysis technique used is descriptive data analysis, namely ana-lysis of quantitative descriptive data carried out to analyze observational data. The quality of the teaching module drafts is compiled and analyzed by material experts, student motivation experts before the implementation of initial trials, food la- trials, and field trials. Based on the three results of the trial, a number of quantitative data were obtained. The data is then analyzed to obtain the expected final research product, which is in the form of a project-based teaching module for natural and social science subjects.

The steps for analyzing the feasibility data of the teaching module are carried out by changing the assessment in qualitative to quantitative form. The lowest eligibility criterion of this study was a minimum grade of B with a good category. So, if the results of its average assessment show the final result B, then the product can be considered worth using.

The analysis of the response questionnaire of teachers and participants inthe dik was carried out by calculatingthe average score given by the students. The average score given by the learner is then converted to a scale of four. The questionnaire of student learning motivation is carried out to determinethearuh of learning tools in terms of the results of the pretest and post-testthrough the results of observation of student motivation. The rating scale of learning motivation filled by the observer produces an average score to be analyzed. The average score scoredwill be converted to ascale of four.

The data that will be analyzed in this study is the learning motivation of students. The analysis was carried outto determine the difference in the increase in learning motivation in the experimental class and the control class. The prerequisite tests that must be met before the t test are the normality test and the homogeneity test. Thenorm alitas test is carried out to determinewhetherthe data from each variabel is normally distributed or not. Normality tests are carried out against motivational standards. The normality test is carried out using the kolmogrorov- smirnov test. The homogeneity test aims to determine whether the data in the experimental group and the control group have the same variance or not. The variance homogeneity test was carried out on learning motivation data. The homogeneity test of learning motivation was carried out using the F test with a signifi- kansi level of 5% of [5]

4. Result and Discussion

4.1. Product Validation Results

The results that have been obtained in this study are project-based learning-based teaching modules developed in the subjects of natural and social science projects. The product in the form of a project-based teaching module has been validated by several experts. Data from the validation of project-based teaching modules includes data on the results of assessments by material experts and learning experts. This data is in the form of assessment scores and input on teaching module products whose learning activities and project-based LKPD are developed. Validation carried out by material experts and learning experts gives the results of an assessment of teaching modules that arecategorized as excellent. That is, the development of teaching modules to increase the learning motivationof students based on the assessment of material experts and learning experts gives a very good assessment so that it is feasible to conduct field trials at SMK Negeri 1 Adiwerna as a school center of excellence for the technology family

4.2. Initial Trial

The initial trial was conducted on 18 students of class X DPIB 2. The purpose of this trial is to collect information in the form of the level of effectiveness of teaching modules that can be used as material to improve the product in the analysis of subsequent revisions. The information collected during the initial trial was in the form of teacher assessment results, student response results, observational data on student learning motivation, and final test assessment results.

The effectiveness of the learning device is known by filling out the teacher's assessment sheet for the learning device by the class   X teacher and filling in the student's response to the learning process that takes place in class X students . Based on the results of the analysis, the total actual score of the teacher assessment obtained in this initial trial was at the interval of good category. This provides information that modules are effectively used in learning.

Based on the results of the analysis of the two components of the effectiveness of the teaching module, it can be seen that the teaching module developed is well categorized. In addition, the number of students who assess good category teaching modules has met the effectiveness requirement of more than 80%. Therefore, it can be concluded that the teaching module measured through the teacher assessment component and student response in the initial trial meets the category of effectiveness.

4.3. Field Trial Results

Field trials were conducted on students of class X DPIB 1 and X TK 3. The students used as trial subjects were 36 participants who did not participate in the initial trial. The purpose of this trial is to collect information in the form of the level of effectiveness of teaching modules that can be used as material to improve the product in the analysis of subsequent revisions. The information collected during the field trial is in the form of teacher assessment results, student response results, learning motivation assessments, and final test assessment results (posttest). The effectiveness of the teaching module is known by filling out the teacher's assessment sheet on the learning device by the PIPAS teacher and filling in the student's response to the learning process that takes place by class X students. Pre-centase of teacher assessment of teaching modules reaches a score above 80%. This provides information that learning wars are considered effectively used in learning. Meanwhile, the percentage of student responses to learning tools developed is on average 100%. A large section of students stated that the teaching modules developed thanks to the category are excellent. Meanwhile, the results of the analysis

of the average total actual score of student responses converted into five scale data also concluded that the teaching module was in the excellent category which indicated that the teaching module was considered effective by students to increase learning motivation.

Based on the results of the analysis of the two components of the effectiveness of the teaching module, it shows that the project-based learning-based teaching module developed has met the effectiveness requirements, which is more than 80%.

The criteria for the effectiveness of teaching modules are measured through an assessment of the learning outcomes test and observation of learning motivation. The results of the student learning outcomes test that meet the complete criteria can be seen in the posttest results of all students who have completed taking the assessment of the learning outcomes test, which is above the KKM of SMK Negeri 1 Adiwerna of 70. This indicates that the teaching modules developed have proven to be effective because students successfully completed the tests given.

4.4. Operational Field Trials

Operational field trials to determine whether there are differences in character development and learning outcomes of the influence of information technology on secondary education in Indonesia are used -t tests.

4.5. Normality Test and Homogeneity Test

The normality test was carried out using the Kolmogorov-Smirnov test at a significance level of 0.05. The results of the normality test of learning motivation data showed that the price of significance of learning outcomes was sub-theme of the impact of information technology advances on health, learning motivation was greater than 0.05 (Sign (p)>0.05). Thus, Ho is received or the data is normally distributed. This is evidenced by both samples in the population in a homogeneous or equal state. This is indicated by Fhitung < Ftabel. Thus, Ho is received or the data is homogeneous. Data that are normally distributed and homogeneous are then carried out t-tests (independent sample t-test) with the SPSS program.

The difference is said to be significant if t count > t table. If t count > t the table, then Ho is rejected and Ha is accepted. Based on these conclusions, there are significant differences in the motivation of students who take part in learning without teaching modules and who use teaching modules as a result of development. The difference is said to be significant if t count > t table. If t count > t the table, then Ho is rejected and Ha is accepted. Based on these conclusions, there are significant differences in learning motivation between students who use the teaching module as a result of development and those who do not use the teaching module without being developed.

4.6. Final Product Discussion

The final product of this development is a   project-based learning-based teaching module to build motivation for class X students of SMK Negeri 1 Adiwerna. Activities in the teaching module spur direct experience, experiments, interviews, demonstrations, group discussions, and doing questions in LKPD. Therefore, teaching modules can make students more interested in learning because every learning in the teaching module is in accordance with the world of students, especially in increasing student learning motivation.

5. Conclusion

Based on the results based on the results of research and discussion, the following conclusions can be drawn.

1) The project-based learning-based teaching module has the influence of information technology on secondary formal education in Indonesia which is developed suitable for use in class X SMK Center of Excellence in engineering clusters

2) The project-based learning-based teaching module is the influence of information technology on secondary formal education in Indonesia which was developed to increase the learning motivation of students is considered feasible to use according to material experts with excellent scores on learning device products.

References

[1]   Umami L. Buku Panduan Project Ilmu Pengetahuan alam dan Sosial. Jakarta: Depdiknas; 2021.

[2]   Kurniawan P, Pendidikan SS-SJ, 2016 undefined. Pengembangan Buku Pengayaan Menulis Teks Prosedur Kompleksyang Bermuatan Nilai-Nilai Kewirausahaan. JournalUnnesAcId 2016.

[3]   Sugiyono S. Metode Penelitian Kuantitatif Kualitatif dan R&D. Alfabeta; 2013.

[4]   Gall J, Gall M, Borg W. Applying educational research: A practical guide 1999.

[5]   Putu Ade Resmayania N, Nyoman Tri Darma Putrab I. Gamification: Using Kahoot! to Make Students Love the Class from the Very Beginning. Linguistics and ELT Journal 2020;7:10–8. https://doi.org/10.31764/LELTJ.V7I1.1649.