

Effectiveness Of Scientific Learning Module Through Project Based Learning Model On Materials Of Processing Organic And Ororganic Waste

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Abstract.

Science Lesson is a subject that demands a lot of conceptual understanding, because in science learning, many students are faced with abstract concepts. Teachers need to direct the students through meaningful learning process that they experience themselves so as to apply knowledge in everyday life. Thus the use of science-based learning-based learning module is expected to increase student activity and learning outcomes. The research development model is a 3-D development model (tree D). The purpose of research is to produce learning module science-based project based learning on the material of organic and inorganic waste is effective. Data collection using validation sheet, practical and module effectiveness. The technique of data analysis is descriptive data, that is by describing the practicality of using science-based learning process-based learning module. Based on the result of research, it can be concluded that the learning module of IPA on organic and inorganic waste processing materials oriented project based learning including effective category in terms of student activity, student motivation and student learning outcomes.

Keywords: Science Learning Module, Project Based Learning Model, Motivation and Activity.

I. INTRODUCTION

Education is a conscious and well-planned effort to build fully qualified human beings as desired. Education can be pursued through the learning process. The learning process is the core of education as a whole. This is according to Sari (1)(2) that "The learning process is a process involving teachers and students in acquiring knowledge, attitude, and skills. In the learning process there is a series of actions of teachers and students on the basis of reciprocal relationships that take place in educational situations to achieve certain goals(8)(9). Interaction or mutual relationship between teachers and students is the main requirement for the ongoing learning process. Teachers not only as a conveyor of materials in the form of subject matter, but as a cultivator of attitudes and values in students who are learning (2)(3). Teacher as the holder of the mandate of the implementation of the national education system has an obligation to realize the development mission. Teachers as education practitioners and spearheads in determining the high quality of education. Thus the teacher should always think and reflect on the learning process that has been done so far in the classroom. Learning should be meaningful and can meet the needs of students. Besides, the teacher should try to overcome the problems that are found by still paying attention to curriculum signs, with professional and maximum responsibility. In accordance with its duties, teachers play an important role in designing and designing lesson plans to be able to carry out an effective and enjoyable learning process. Therefore, teachers should be able to choose learning methods and strategies, taking into account the subject matter, the media used, and the condition of students in the process of science learning in school. Understanding the concepts, principles, theories and process skills must be considered by the teacher (8)(10).

One of the most practical and realistic efforts in improving the quality of the process and the result of student learning as an indicator of the quality of education is the improvement and refinement of the learning system. The effort is directed to the quality of learning as a process that is expected to improve the quality of learning outcomes. In PP No. 19 of 2005 Article 20, it is suggested that teachers are expected to develop learning materials, which is then confirmed through the Regulation of the Minister of National

Education (Permendiknas) number 41 of 2007 on Process Standards, which among others regulates the learning process planning which requires for educators in the unit education to develop learning tools (11) (12). Learning tool is a collection of learning resources that enable students and teachers to do learning activities. The module is one of the learning tools that has an important role in the learning process. According to (1)(4) module is a planned type of learning activities designed to assist students individually in achieving their learning objectives. The developed modules are designed in such a way as to attract students' attention in learning and make it easier for teachers to achieve complete learning. Similarly, the use of modules is expected to increase student activity and learning outcomes (13). Based on the description, one of the suitable learning strategies to improve students' understanding of the concept of organic and inorganic waste processing materials is the model of Project Based Learning. The Project Based Learning model offers a new paradigm in the learning world.

As the foundation of the learning paradigm, project-based learning calls for the need for active participation of students in the learning process, the need for independent student learning development, and the need for students to have the ability to develop their own knowledge. The student is no longer positioned like an empty vessel ready to be filled and stuffed with information by his teacher, or the student is conditioned in such a way as to receive knowledge from his teacher. Students are now positioned as teacher learning partners. Teachers are not the only information centers and the best know. Teachers as one source of learning or information sources, are placed as facilitators. According (5) approach to learning project based learning basically emphasizes the importance of students build their own knowledge through active involvement in the learning process. In learning the students themselves learn to find concepts by studying the available images, as well as performing activities within the module. Thus the students actively construct their own knowledge by means of independent learning so that activities in learning can occur. The occurrence of an easier understanding, predicted to increase students' motivation to learn the next material. Based on the above background, the formulation of the problem presented is "how is the effectiveness of science-based learning module based project learning on organic and inorganic waste processing materials?", which aims to produce learning modules science-oriented project based learning on organic and inorganic waste processing materials effective.

II. METHODS

Based on the background, then the type of research that will be done is research development using 3-D model (define, design and develop). Module effectiveness test seen from result of learning and student activity on class D on organic and inorganic waste treatment materials. From the test results of the study and the results of the observer's assessment conducted data analysis by converting into the formula and using the criteria of validity. Thus obtained an effective learning-based learning-based learning module. The research instrument used to collect data in this research is student activity sheet and student learning result sheet. The data obtained were analyzed descriptively, by describing the effectiveness of science-based learning-oriented learning module.

III. RESULTS AND DISCUSSION

A. Results

1. Student learning motivation

The result of student learning motivation analysis by using science-oriented learning-based learning module can be seen in Table 1.

Table 1. Results of Student Motivation Analysis Analysis in Learning Using Science-Based Learning Module Project Based Learning

No	Indicator	Percentage (%)	Motivation Criteria
1	Interest / concern	3,45	High
2	Relevance	3,59	Very high
3	Hope / confidence	3,5	Very high
4	Satisfaction	3,68	Very high

Average	3,55	Very high
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Based on Table 1 it can be seen that from 4 indicators of student learning motivation based on student questionnaire that is: interest / attention, relevance, expectation, and satisfaction show scores average value 3.55. Thus, if viewed from the student's learning motivation, then the effectiveness of the use of this module is very effective in learning the Reproductive System. Where the percentage of student learning interest by using learning module project based learning 3.45% is in the high category. Meanwhile, the indicator of relevance, expectation / satisfaction and satisfaction are in very high category and different percentage ie, relavance 3.59%, 3.5% expectation / confidence and 3.68% satisfaction. The result of questionnaire of student motivation for 4 indicator of observation done in three times of learning activity showed that student motivation during doing learning activity included in very high category. Thus, the effectiveness of science-oriented learning-based learning module is said to be well used in learning activities.

2. Student activity

The activities of learners during the learning activities took place observed using the instrument of observation of student activity. The average results of student activity observations are shown in Table 2.

Table 2. The results of the activities of Student Learning Activity in Learning Using Science-Based Learning Module is project-based learning

No	Aspect of observation	Meeting			Average percentage (%)	Event Category
		I (%)	II (%)	III (%)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Pay attention to teacher explanations	97,73	95,45	100	97,73	Very effective
2	Use the module according to the instructions given	87,5	93,18	88,64	89,77	Very effective
3	Studying the material and Answering questions on learning activities	97,73	100	100	99,24	Very effective
4	Discuss/answer questions with other students or with teachers	79,54	72,73	80,68	77,65	effective
5	Work on spreadsheets and evaluations	100	100	00	100	Very effective

Based on the data in table 2 it can be seen that the learning activities of students in learning using science-based learning module project based learning on the material processing of organic and inorganic limbah very effective. It can be seen that the 5 aspects of student observation indicate that the student activity on the learning module used is positive. Where aspects of discussion / question and answer with other students or with teachers get an average percentage of 77.65 with effective category. In the meantime, the aspect of paying attention to the teacher's explanation, using the module according to the guidance given, studying the material and answering the questions on the learning activities and working on the worksheet and the evaluation are very effective categories where the percentage scale is 81% - 100%. Therefore, it can be concluded that the use of learning modules based on student activity is very effective in learning.

3. Student learning outcomes

The learning outcomes of cognitive aspect to know the effectiveness of science-based learning process-based learning module is known from formative test. Problems are given after the learning-oriented learning-based IPA module is tested. The test question used is an assessment component of the developed module. Questioning previous trials has been done qualitatively. Problems that have been valid used for effectiveness test with 30 grains. In analyzing the learning outcomes on the cognitive aspects of students used the criteria mastery learning. Student learning completeness seen from student learning result through formative test which compared with KKM. Based on the results of learning that has been achieved, it appears that learning by using science-based learning module project based learning on organic and inorganic waste processing materials can help students in understanding the material so as to obtain good results. This can be seen from the average score obtained by the students that is 84.14 is above the KKM is 75 and the classical science learning by using science-based learning process-oriented learning module is said to be complete

B. Discussion

1. Effectiveness of learning module

The effectiveness of science-based learning-oriented learning module on the processing of organic and inorganic waste can be seen from students' learning motivation, student learning activities, and student learning outcomes.

A. Student motivation

Student motivation during the learning process is one of information about the student's response about the use of learning module that is used. In this development study the students' motivations observed by observers during the learning process include: interest / attention, relevance, expectations / beliefs and satisfaction. For all aspects of the motivation questionnaire are at very high criteria with the average percentage of student motivation in learning is 3.55. The percentage is obtained from the questionnaire analysis which shows that almost all students are happy to learn by using the learning module, because basically people will be happy to do what is of interest. The existence of motivation to cultivate the desire of students to be more active and diligent in learning so as to get a satisfactory learning outcomes, because motivation is the basic capital in the learning process (14)(15). High motivation encourages students to move well and will have an effect on student learning outcomes in the classroom. This is seen from the result of student learning analysis, it is known the average of student learning outcomes is 84.14 and all students reach KKM.

B. Student learning activities

The result of observation on student activity showed that the activity done by the students during the learning varied. This shows that the activities of students in the class are not monotonous. Through science-oriented learning-based learning module, students can be more active in science learning. This is consistent with the results of the student activity analysis during the learning process of meetings 1, 2, and 3 showing all the desired activity appears in the observer observation, such as (1) taking into account the teacher's explanation, (2) using the module according to the instructions given, (3) to study the materials and answer questions on learning activities, (4) discussions / questions with other students or with teachers, (5) working on worksheets and evaluations. This is in line with the opinion of Kemp and Jerrol (6) (16) (17) states "student activity in learning can be seen based on participation and involvement in responding".

C. Student learning outcomes

Analysis of learning outcomes is used to determine the completeness of learning per-student on organic and inorganic waste processing materials using learning modules, at the end of the student learning is given about the quiz in the form of objective tests of 30 questions. (7) (18) (19) Trianto suggests "the test results of learning is a test item used to determine student learning outcomes after following the learning activities". The average result of quiz value processing compared with KKM, so that will be obtained by individual mastery in basic competence with material of reproduction system. According (7)(20) KKM is a learning completeness criteria determined by the educational unit (each school). According to Depdikbud (7) (19) (20) "Each student is said to be complete learning (individual completeness) if the proportion of students answer correctly $\geq 65\%$, and a class is said to be complete learning (classical completeness) if in the class there are $\geq 85\%$ has finished learning".

Thus we can conclude that learning by using learning module science-based project based learning on organic and inorganic waste processing materials individually and classically dissolved completely. Based on students' motivation, activity, and learning result, it can be concluded that science-based learning process based learning module on organic and inorganic waste processing materials is effective as a medium / teaching material that helps students in learning. Although the learning process using science-based learning process-based learning module on organic and inorganic waste processing materials has advantages, but also there are obstacles encountered. The main obstacle encountered during the learning process is that teachers sometimes seem overwhelmed to respond to the number of students who want to ask questions and answer teacher questions. Although this indicates a positive response, the control of students who want to ask questions or questions needs to be done better for the future in order to reduce the noise caused by the

students' voices when asking questions or answer questions from teachers, because the atmosphere conducive to support the learning process in school.

IV. CONCLUSION

Based on the results of data analysis and discussion it can be concluded that the learning module IPA oriented project based learning on organic and inorganic waste processing materials including the category highly effective in terms of motivation, activity and student learning outcomes.

V. ACKNOWLEDGEMENT

The research team would like to thank all the parties who have helped this research especially to DIKTI who have funded this research so that it can be completed.

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