Analysis of Teacher and Student Needs for Development E-Module Based on Project Based Learning Materials of Environmental Change in Class X SMA/MA

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Abstract. This study aims to analyze the needs of students and teachers on the use of environmental change teaching materials. The research used a descriptive method. The subjects in this study were 32 students of class X MIA 2 and 2 biology teachers at SMAN 22 Gowa. Data collection techniques using interviews and questionnaires. Based on the interview results with biology teachers, it was obtained that, (1) the teaching materials used in environmental change was limited quantity and not integrated with technology, (2) teaching materials do not meet all learning indicators, (3) students are less active in learning because teachers use direct learning model. While the information obtained from questionnaires is, (1) as many as 58% of students stated that the teaching materials used in schools were not sufficient for all students, (2) as many as 65% of students stated that the teaching materials used were uninteresting and irrelevant with daily life, (3) as many as 61% of students stated that teaching materials did not increase learning motivation, (4) as many as 90% of students stated that had never been given project based assignments, (5) as many as 100% of students stated that they needed interesting and technology-based teaching materials to study environmental change materials. Therefore, teaching materials are needed that can increase students' motivation and independence in learning, of course with the application of technology, namely e-module based on project based learning (PjBL).
Keywords: E-module, environmental change

INTRODUCTION

Education is the main key in advancing and improving people's lives in a better direction. Therefore, improving the quality of education is important. One of the efforts made by Indonesian is to change curriculum. Kurikulum Tingkat Satuan Pendidikan (KTSP) which was the initial curriculum, has been changed to the Curriculum 2013 (K13), which is designed to enhance the Indonesian educational system. The curriculum 2013 focuses on the activeness, creativity and creating meaningful learning. The teacher's as a motivator and facilitator must manage the class so that students are more proactive. Of course, in the learning process the teacher cannot be separated from the use of teaching materials.

Teaching materials are all materials (information, tools, and tests) that are systematically arranged that fully display the learning competencies that must be mastered by students and used during the learning process with the aim of planning and reviewing the

implementation of learning (Prastowo, 2013). The most important component of the curriculum is the teaching materials. The purpose of instructional materials is to provide exercises for students to practice interactive communication, information referencing, and a source of stimulant (Sukmawati, 2015). So that the learning process may be deemed successful, it is important to use teaching materials that are in line with the needs and personality traits of the pupils.

Based on observations at SMAN 22 Gowa, the learning problems are that students were passive and depended on the teacher's explanation, limited quantity of teaching materials and the teaching materials used did not attract attention because the presentation was still text book. However, giving better teaching materials can help improve the standard of learning.

The advancement of science and technology encourages creativity in the improvement of the educational system, including creativity in the creation of teaching materials that make use of technology. The use of technology in question is by using gadgets. Teachers can more easily transmit information to students because the information can be better represented through visuals that more real. Presentation of material by utilizing technology is also able to overcome the limited number of teaching materials so that all students can have learning materials. In addition, the use of gadgets in the learning process is in accordance with the potential of today's students, almost all of whom have smartphones or laptops, so that there is or is not a teacher directly, the learning process can still be carried out because the teacher is no longer the only source of learning.

Teaching materials that can make students active and independent in the learning process are electronic learning modules (e-module). E-module have several advantages, namely being interactive, easily accessible on smartphone or laptop, and equipped with facilities such as learning videos, animations, images, and audio (Pramana, Jampel & Pudjawan, 2020). In addition to these advantages, e-module is also more environmentally friendly because they do not use paper in their manufacture.

The use of teaching materials certainly cannot be separated from the application of learning models. Based on Permendikbud No. 65 of 2013, one of the suitable learning models to be applied in K13 is project-based learning. The project based learning (PjBL) model is a model that teaches students to think critically and find solutions to real-life problems. The application of project-based learning can provide students with opportunities to understand concepts in depth and improve learning outcomes (Wahyu, 2016). The PjBL model is also very suitable to be

applied to environmental change material because this material is part of biology learning, which is quite interesting and challenging because it is directly related to the realities encountered every day. But this material is often presented with the method of memorizing concepts without involving the active role of students.

Therefore, the current learning process requires the activeness and independence of students in understanding concepts so that learning becomes more meaningful. Therefore, an analysis of the needs of teachers and students was carried out for development of e-module teaching materials based on project based learning materials on environmental changes so that students were more active and independent in the learning process.

RESEARCH METHOD

This research is a descriptive research. The methods used to collect data are distributing non-test questionnaires of 10 items to 32 students in one study group and conducting structured interviews with 2 biology teachers at SMAN 22 Gowa. The data analysis technique is to calculate the percentage of questionaries answers and describe the interview's outcome. The research data obtained are then presented descriptively in order to draw conclusions about the needs of teachers and students for an e-module based on project-based learning on environmental change. The sampling technique uses simple random sampling because we don't know the abilities of all study groups so they are taken randomly.

RESULTS AND DISCUSSION

Data analysis in the study was carried out by outlining the needs of teachers and students for the development of e-module based on project based learning that can support the learning process, especially material for environmental change. The results of interviews with two biology teachers stated that the teaching materials used by students on environmental change materials were textbooks, which were limited in quantity and there were no other teaching materials that could add to learning information. The resumes from the biology teacher interviews are presented in Table 1 below.

Table 1. Teacher Interview Results

No.	Questions	Answer	
		Teacher 1	Teacher 2
1.	What teaching materials do you use in class, especially for environmental change?	Books	Books
2.	Have you ever used a project-based learning model on environmental change materials?	No. But using a natural exploration approach.	No. Only use the direct learning model
3.	Are there any shortcomings in the teaching materials that you use?	Yes, the books is very limited and not all indicators are met in the book.	The books can only be used at school, students cannot take them home.
4.	In your opinion, is it important to use teaching materials that are in accordance with current technology ?	It is very important, so as not to be out of date and teaching materials must also be in accordance with the development of students.	It is very important, because teaching materials must also keep up with technological developments.
5.	Have you ever used modules in the learning process? If so, what kind of module is used? If not, what kind of module to expect? a. Electronic module b. Module	Have used electronic modules but not on environmental change materials.	Never been, and wish there was an electronic module.
6.	In your opinion, is the use of electronic modules suitable for use in schools?	Exactly, because it is more practical to use and contains a lot of interactive material.	Exactly, because electronic modules are more practical and can be accessed anywhere.
7.	In your opinion, is the use of electronic modules in environmental change materials appropriate for use in schools?	Exactly.	Exactly.

The results of the analysis of table 1 explain that regarding environmental change material, teachers have never used the PjBL learning model, even though this material is very close to everyday life so that students can be invited to solve problems related to the environment. The PjBL model is very suitable to be applied to environmental change

material because according to Sumarmi (2012), PjBL is contextual learning that prioritizes student activity (student center) and uses problems in the surrounding environment to reconstruct knowledge and learning skills. Wahyu (2016) states that the PjBL learning model can increase students' creativity and learning motivation because it focuses on the core curriculum, facilitates students to investigate, solve problems, give assignments, student centers, and produce real products. The goal is for students to have independence in completing the tasks they face.

The teaching materials used by the teacher are text books which are limited in quantity and cannot be owned by students so that learning becomes less than optimal. Optimal learning requires effective teaching materials which are the main source of information in the learning process. One of the teaching materials that can be used by teachers is modules. According to Prastowo (2013), modules are teaching materials that are arranged systematically using language that is easy to understand and can be studied independently. Along with the times, modules are not only presented in printed form but are also presented in electronic form.

Electronic modules are technology-based teaching materials that teachers want because they look more attractive and interactive than printed books. Based on the analysis of the students' needs questionnaire presented in Table 2, information was obtained that the use of printed books did not increase motivation and independence in learning so that students needed alternative teaching materials to study environmental change material.

Tabel 2. Results of the analysis of students needs

No.	Questions	Persentage	
		Yes	No
1.	Do you like biology lessons?	87%	13%
2.	Do you struggle when studying environmental change material?	52%	48%
3.	Has the teacher ever assigned a project that had to be finished in a specified amount of time?	10%	90%
4.	Are there any teaching materials used at school?	100%	0%
5.	Are the teaching materials only text books?	52%	48%
6.	Are the teaching materials sufficient for all students?	42%	58%
7.	Are the teaching materials interesting and relevant to real life?	35%	65%
8.	Do the teaching materials used help you understand the material and increase your learning motivation?	39%	61%

9.	Do you need interesting alternative teaching materials to learn about environmental change?	100%	0%
10.	Have you ever used electronic module in the learning process?	0%	100%

Table 2 shows that in general students like biology lessons but still have difficulty learning environmental change material because the content of teaching materials is less interesting and less relevant to everyday life. In addition, the number of printed books used is limited so that learning is less than optimal. Irfan, et al (2019) said that the use of textbooks in learning only develops the ability of students to achieve learning objectives from the product dimension so that the process dimension is forgotten. The process dimension not only develops cognitive aspects but also affective and psychomotor aspects which can be obtained from other teaching materials, such as modules.

Based on Table 2, as many as 61% of students stated that the teaching materials used by the teacher did not increase learning motivation because the material presented in the teaching materials was only in the form of solid writing and did not contain pictures. The use of e-modules as technology-based teaching materials with audio, video and animation presentation facilities can attract attention and increase student learning motivation. Moreover, all students stated that they had never used e-modules in learning and needed supporting teaching materials to study environmental change material.

The results of the analysis of the needs of teachers and students will be developed by e-modules based on project based learning on environmental change materials that are able to increase student learning motivation and independence.

CONCLUSION

Based on the results of the needs analysis, it was found that in the matter enviromental change, teachers and students need technology-based teaching materials that can overcome the problem of quantity of teaching materials, increase motivation and learning independence through based on project activities. Thus, it is necessary to develop an e-module based on project based learning materials environmental change.

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