

DEVELOPMENT OF E-MODULES USING THE STAD LEARNING MODEL TO IMPROVE ECOLOGICAL COMPETENCE (ASPECTS OF KNOWLEDGE AND ATTITUDES)

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ABSTRACT

Improving the quality of education, one of which can be done by using teaching materials that are by learning objectives. Based on preliminary research conducted at SMAN 1 Kertasari, in general, the teaching materials used only came from student handbooks provided in the school library. Therefore we need innovation in the use of teaching materials. The teaching materials used in this study are digital-based teaching materials that focus on materials on land use and conservation, bearing in mind that Kertasari District is a conservation area with indications of critical land. The teaching materials used are also combined with the STAD (Student Team Achievement Division) learning model. The purpose of this study was to determine the use of e-modules with the STAD learning model for the achievement of ecological competency aspects of knowledge and attitudes in geography subject class 10 social studies at SMAN 1 Kertasari with sub-materials on land use and conservation. This study used a Quasi-Experimental method with a Nonequivalent (Pre Test and Post Test) Control-Group Design. The results of the analysis show that the use of e-modules with the STAD learning model increases the ecological competence of students in terms of knowledge. Likewise, the aspect of attitude obtained a very high percentage of results.

Keywords: *E-Module, STAD Learning Model, Ecological Competence*

1. INTRODUCTION

Education is one of the important aspects that every individual must have to improve its quality. According to The Law of the Republic of Indonesia, No. 20 of 2003 concerning the National Education System article 1, education is "a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual power, noble morals and the skills needed for themselves, society, nation, and state". The success of national development is determined by qualified human resources. Quality resources are obtained by improving the quality of education at every level of education. (Permani and Priyanto, 2018).

Improving the quality of education can be seen from 2 points of view, namely the teacher's point of view and the student's point of view. From the teacher's point of view, one of them can be seen from the professional aspect of the teacher. How teachers can create a pleasant learning climate so that they can assist students in achieving their desired learning goals. Likewise from a student's point of view. Today learning is focused on students. Students are required to be active, creative, and, innovative during the learning process. Therefore, to create an atmosphere that supports this,

teachers are also required to be able to guide students during the learning process. This can be done by using teaching materials that interest students in reading and learning.

This is preliminary research conducted by researchers in grade 10 social studies at SMAN 1 Kertasari. Based on the results of an interview with one of the geography teachers, it can be concluded that the learning that takes place is still mostly using the lecture method. Likewise with the results of interviews conducted with students. Students rely solely on sourcebooks from the school and then rerecord their respective notebooks. This causes students to get bored and feels that geography is an elusive subject.

There are various types of teaching materials. One of the teaching materials that are often used is modules. Along with the advancement of science and technology, print modules innovate and turn into digital-based modules or commonly known as e-modules. According to Rahmi (2018), e-modules are self-learning media that are packaged in digital form to realize the learning competencies to be achieved, as well as make students more interactive with the application. In it can be added pictures or videos that can add to the attractiveness of the material presented. According to the Ministry of Education and Culture (2017) that the use of e-modules not only fosters the effectiveness & quality of learning but also expands the mastery of the material, both teachers and students.

According to research conducted by Setiawan and Waarin (2017) to obtain maximum goal results, the use of teaching materials must be following the learning model used. One of the learning models that fit geography is the STAD (Student Team Achievement Division) model.

STAD is a cooperative learning model in which there are several small groups of students with different levels of academic ability working together to complete learning objectives (Huda, 2013). According to Slavin, in STAD students are placed in a learning team of 4-5 students which is a mixture according to achievement level, gender, and ethnicity (Trianto, 2009). In STAD, some quizzes can stimulate students' activeness and enthusiasm in learning the material. STAD was developed to achieve at least three important learning objectives, namely academic learning outcomes, acceptance of diversity, and development of social skills (Ibrahim, et al, 2007).

In addition, morphologically, Kertasari District is a mountainous area where there is the Upper Citarum River in it, thus making the area a conservation area. Of course, this situation makes Kertasari District one of the areas that are maintained by all parties, including students or students as *agents of change*.

However, according to Fauziah, N (2016, p.2), based on data from the Bandung Regency Agriculture, Forestry and Plantation Service (2015), Kertasari District is the area with the largest critical land in Bandung Regency. The percentage of critical land in Kertasari District reaches 44% of the total area of Kertasari District. The percentage of critical land for private/people-owned agricultural land reaches 10.5%. The total land area in question is 363.2 Ha.

Therefore, sensitivity to the surrounding environment is one of the things that must be owned by students. According to Onal & Alaattin (2011) :

"Having environmental awareness constitutes the fragment of modern person behaviors which involves civil rights' equality and justice principle. Modern person's environmental awareness also requires a struggle against inequality, poverty, hunger, and moral fiber. Therefore, environmental education has to be applied regularly, consistently, and constantly to establish awareness of the environment".

The environmental aspect is very synonymous with learning geography. Therefore, the purpose of learning must boil down to improving the environmental aspects of students. Environmental aspects in eco pedagogics in the form of ecological competence. Ecological competence is a competency related to aspects related to ecology in the educational context that must be mastered by students in learning (Muhaimin, 2015). The Ministry of Environment (2004) revealed that ecological competence includes several learning domains in the form of knowledge/understanding and awareness, attitudes/values, skills, and action/participation.

Therefore, the use of digital teaching materials and STAD-type cooperative learning models is expected to improve the ecological competence of students at SMAN 1 Kertasari.

2. LITERATURE REVIEW

2.1 Teaching Material: E-Module

Teaching materials are a set of materials that are systematically arranged both written and not to create an environment/atmosphere that allows students to learn. Teaching materials have a very important meaning in the learning process (MoNE, 2007). The material in question can be written material or unwritten material. Teaching materials are a set of materials that are systematically arranged whether written or not to create an environment or atmosphere that allows students to learn. Printed teaching materials can be textbooks, modules, workbooks, scientific magazines, and hand-outs (Suyatman, 2013).

One of the surviving printed teaching materials is modules. According to Anwar (2010), modules are systematically and interestingly compiled teaching materials that include material content, methods, and evaluations that can be used independently to achieve the expected competencies. The objectives of using modules in learning are: (1) students can learn on their own without help from the teacher; (2) teachers no longer become authoritarian during learning; (3) students can practice honesty; (4) used as a

measuring tool for students in mastering a material (Tjijptiany, 2016).

Meanwhile, according to Ricu Sidiq and Najuah (2020, p. 13) modules are units of planned learning activities designed to help students complete certain goals by organizing subject matter tailored to the individual's personality to maximize their intellectual abilities. Modules are specially designed and based on each student's speed of understanding, thus encouraging students to learn according to their abilities. Along with the development of science and technology, there is currently a transition from print media to digital media. Learning modules have also transformed in terms of their presentation to electronic forms, known as electronic modules (e-modules).

Fausih and Danang (2015) suggest that e-modules are learning materials that are systematically designed based on a certain curriculum and packaged in the form of certain units of time, which are displayed using electronic devices such as computers or androids. According to Rahmi (2018), e-modules are self-learning media packaged in digital form to realize the learning competencies to be achieved, as well as make students more interactive with the application.

Based on this presentation, it can be said that the e-module is an advanced version of the printed module (*new version*) that can be used independently by those that are systematically designed following the applicable curriculum to make it easier for students to achieve learning goals.

According to the Ministry of Education and Culture (2017) that the use of e-modules not only fosters the effectiveness & quality of learning but also expands the mastery of the material, both teachers and students. According to (Kosasih, 2021), the module to be developed must pay attention to the five characteristics of a module, namely self-instruction, self-contained, stand-alone, adaptive, and userfriendly.

2.2 STAD (Student Team Achievement Division)

The teaching materials developed must apply different learning models to create a more attractive classroom situation in learning activities (Kul, et al, 2018). One of the learning models that can be applied in geography learning is the STAD learning model.

STAD is a cooperative learning model in which there are several small groups of students with different levels of academic ability working together to complete learning objectives (Huda, 2013). According to Slavin, in STAD students are placed in a learning team of 4-5 students which is a mixture according to achievement level, gender, and ethnicity (Trianto, 2009). In STAD, some quizzes can stimulate students' activeness and enthusiasm in learning the material. STAD was developed to achieve at least three important learning objectives, namely academic learning outcomes, acceptance of diversity, and development of social skills (Ibrahim, et al, 2007).

The STAD-type cooperative learning model is a Cooperative Learning approach that emphasizes activities and interactions among students to motivate each other and help each other in mastering the subject matter to achieve maximum achievement. STAD has five principles, namely: 1) The principle of positive interdependence (positive interdependence); 2) Face to face promotion interaction; 3) Participation and communication; 4) Evaluation of group processes. If this principle can be implemented properly, this model will be effective in activating students which

has an impact on improving student learning outcomes. (Esminto, et al, 2016 p.16)

According to Trianto (2009, p. 67), the phases or steps (syntax) in cooperative learning type STAD (Student Teams Achievement Division) include:

1. Phase 1: Conveying goals and motivating students Conveying all the lesson objectives to be achieved in the lesson and motivating students to learn.
2. Phase 2: Presenting/conveying information Presenting information to students by way of demonstrating or through reading materials.
3. Phase 3: Organizing students in study groups Explaining to students how to form study groups and helping each group to make the transition efficiently.
4. Phase 4: Guiding work and study groups Guiding study groups as they work on their assignments.
5. Phase 5: Evaluation Evaluates learning outcomes about the material that has been taught or each group presents the results of its work.
6. Phase 6: Rewarding Looking for ways to reward both individual and group efforts and learning outcomes.

3. METHODS

3.1 Method and Research Design

The method used in this study is quasi-experimental. This study used a quasi-experimental method because this study had an experimental group that was not randomly selected. Quasi-experimentation is a research method that has groups of samples according to actual conditions, which means that in determining the experimental class and control class, it is not randomized. This is the opinion of Cresswell (2010) in quasi-research there is an experimental group that is formed in a non-random manner so that the group is in real condition.

The type of quasi-experimental design used in this study is the *Nonequivalent (Pre Test and Post Test) Control-Group Design design*. Sugiyono (2013: 77) stated that in this design the experimental group and the control group were not randomly selected. In this study, the author used 2 class groups, namely the experimental class and the control class. For experimental classes, treatment was given using the STAD learning model.

3.2 Subject Experiment

The experimental subjects in this study were students of grade 10 social studies at SMA Negeri 1 Kertasari. The samples in this study were taken based on the similarity of the same traits and characteristics, in terms of the initial ability of the learners before being given treatment. To see the initial ability of learners researchers use pre-test result scores for each class. Here's a list of grade gains for each class.

Table 3.1 List of Grade Gains/Test Results

No.	Class	Lowest Value	Highest Value	Average	Percentage of KKM
1.	10 IPS 1	20	95	56,3	26%

2.	10 IPS 2	20	97	45,6	7%
3.	10 IPS 3	15	85	46	21%

Source: Research Results 2023

Based on these data, researchers chose class 10 social studies 2 with an average score of 45.6 as experimental class one (X₁) and class 10 IPS 3 with an average score of 46 as experimental class two (X₂). It is based on the average scores of the two classes are not much different so the initial abilities of the two classes are considered the same.

3.3 Variable

Research variables are concepts that have value for defining a research study. The variables in this study are Digital-Based Teaching Materials oriented to the STAD Learning Model as a free variable and Ecological Competence (Aspects of Knowledge and Attitudes) as a bound variable.

4. RESULTS & DISCUSSION

Ecological competence of knowledge aspects using e-modules with STAD learning models measured using tests (pretest and posttest) in the form of descriptions. The test was given to 31 learners. The administration of the final test (post-test) is carried out after being given treatment in the experimental class.

The learning outcomes are known from the data obtained through tests with the material lithosphere dynamics and their effect on life, the sub-theme "land use and conservation" showed an increase, from an average pretest value of 56.3 after being treated rose to 76.7. This shows that the use of e-modules oriented to the STAD learning model provides positive value in improving the ecological competence of students in aspects of knowledge

For ecological competence aspects of attitudes are measured using a Likert scale. The questions consisted of 10 questions given to 31 respondents in the experimental class. The results of the analysis show that the maximum score weight is 1650. The total score obtained based on the results of the study is 1341. Thus obtained a percentage of 81.27%. Based on the criteria and interpretation of scores from Ridwan and Akdon (2010) the figure is included in the very high category.

5. CONCLUSION

Ecological Competence Aspects of students' knowledge of land use and conservation materials have increased with moderate criteria after going through learning using e-modules with the STAD learning model. This can be seen from the increase in pretest and posttest scores given to students before learning and after going through the learning process.

Ecological Competence Aspects of students' attitudes to land use and conservation material show positive values with very high criteria after going through learning using e-modules with the STAD learning model. This can be seen from the total questionnaire scores given to students after the learning process.

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