

THE EFFECT OF PEER TEACHING METHOD ASSISTED BY E-MODULE MEDIA ON STUDENTS' CONCEPT UNDERSTANDING AND SCIENTIFIC ATTITUDE

Risky Indah Yuliasari ^{1*}, Haslinda Yasti Agustin ²

^{1,2}Tadris Biologi, Fakultas Tarbiyah dan Ilmu Keguruan, Universitas Islam Negeri Sayyid Ali Rahmatullah

Jl. Mayor Sujadi No. 46 Kudus Plosokandang, Tulungagung, 66221, Indonesia

Corresponding author e-mail: ^{1*} riskyindahyuliasari19@gmail.com

Abstract. The difficulty of students in understanding the concept of classification of living things is complicated because it has many branches of classification. Educators who tend to provide material using the lecture method cause the learning process to be less varied. This will have an impact on students' low understanding and scientific attitude in learning so that it will affect their activity in class. The method used is quasi experimental with nonequivalent control group design. Data collection methods are tests and observations. The observation sheet was used to obtain data on students' scientific attitudes. Tests were used to obtain data on students' concept understanding. Data analysis used prerequisite tests and hypothesis tests. The prerequisite test is normality and homogeneity test while the hypothesis test uses independent sample T-test, Manova test and Effect size. Aiming to analyze the effect of peer teaching method assisted by e-module media on students' concept understanding and scientific attitude on the material of Classification of Living Things in class VII MTs PSM Tanen Rejotangan. The results of this study indicate that there is a positive and significant effect of peer teaching method assisted by e-module media on the understanding of concepts and scientific attitudes of seventh grade students on the material of Classification of Living Things. Based on the results of the Gain manova test from the pretest and posttest question sheets and the observation sheet obtained the Sig. (2-tailed) is 0.000 and 0.015 H₀ is rejected and H₃ is accepted.

Keywords: E-module, Classification of Living Things, Peer Teaching, Concept Understanding, Student Scientific Attitudes.

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1. INTRODUCTION

Education is an effort made to increase insight in the scientific field studied, develop potential, spiritual and physical development in students. Therefore, the implementation of education is expected to have a positive impact on students in order to have the development of ways of thinking, mental management skills, and emotions. In addition, education is a process of provision that is carried out to prepare students to run their lives in the present and the future.[1] Explained in Law No. 20 of 2003 states that: “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 strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state.” [2]

In the Law, it can be underlined in the section "so that students are active" it can be concluded that education aims to encourage students to be active in developing their potential which includes the development of spiritual strength, religion, self-control, personality, intelligence and skills needed for themselves, society, nation and state.

In addition, mentioned in the Regulation of the Minister of Education and Culture number 22 of 2016 concerning Process Standards for Primary and Secondary Education Chapter I states that: “The learning process in educational units is organized in an interactive, inspiring, fun, challenging, motivates students to actively participate, and provides sufficient space for initiative, creativity and learning independence of students according to their talents, interests and physical and psychological development.[3]

The sentence emphasizes the importance of motivating students to actively participate, as well as providing space for creativity and learning independence according to the characteristics of each student. This reflects a learning approach that focuses on active student involvement, developing creativity, and providing freedom in learning according to their talents, interests, and physical and psychological development.

Active participation of students in the learning process is very important, especially in learning natural science (IPA). Science is a type of knowledge obtained through data collection, experimentation, observation, and inference to explain scientifically reliable phenomena. Of course, this cannot be separated from the important role of the teacher, who needs the right learning methods and learning media according to the topic being taught.[4].

In the current curriculum, one of which is in the process of learning science, students are required to play an active role in expressing the ideas and ideas they have when the learning process takes place. There are several methods that can be used by teachers to involve students actively in the learning process, one of which is the peer teaching method. The peer teaching method is a method where one student teaches another student or in other words, the role of the teacher is the student. This method can be used by teachers so that students have a sense of mutual respect and understanding, can work together to make it easier for students to learn, actively participate and can solve problems together, so that understanding of learning materials can be evenly distributed to all students.[5]

This research is supported by Khalisa Qatrunnada who said that the peer teaching method can support students to be active, to be able to help teach fellow friends in the group, and can reflect on their own experiences, so that the learning pattern becomes active, interactive, critical, and student-centered. Student activeness is not only focused on the group tutor, but all members also feel active in the group. As when working, all members must pour their ideas and ideas.[6]

In addition to appropriate methods, a teacher also needs teaching media/materials that are fun and varied so that the knowledge gained by students can increase. Teaching media/materials are one of the determinants of success in the process of teaching and learning activities. Teaching materials used by teachers and students should not only stick to one type, this is done to anticipate if one teaching material has deficiencies, it can use other teaching materials. If only one book is used in the learning process, it will make it difficult for students to understand the material. [7] Therefore, this method can be paired with media that is fun and of course in accordance with technological developments, namely e-modules.

Electronic modules or (e-modules) are a form of independent learning material that is systematically arranged, displayed in electronic form with sound and animation.[8] Electronic modules help students to learn independently, depending on the subject by using electronic means. E-modules enable effective learning as they allow students to bring the material to life in a systematic and structured manner and present the material in an organized format. E-modules contain a lot of material and exercises to make it easier for students to use the module.[9]

This research is supported by Yanti Febrianti who said that students experienced better changes including students being active and more enthusiastic in learning, the material presented can be understood by students well, many changes in students in a positive direction. In addition, the application of e-modules with the flipbook application increases courage and high self-confidence in students because students are trained to demonstrate directly on their respective computers according to the steps in the e-module.[10] Therefore, the methods and media used by teachers are expected to be able to support students' understanding of concepts, process skills, application of concepts and scientific attitudes.

Concept understanding is one of the skills or proficiencies that are expected to be achieved in learning, namely by showing an understanding of the concepts learned, explaining the relationship between the right concepts in problem solving.[11] Understanding of student concepts is formed when students will interpret the concepts learned, compiling their own understanding from basic concepts to more complex ones. Understanding the concept is very important for students to have, by understanding the concept students will more easily learn the material received. In addition, students will also find it easier to accept new concepts. Understanding concepts is not only by memorizing but by learning concrete examples, so that students are able to define information themselves.[12] Therefore, in the process of learning science, teachers provide guidance and provide various opportunities that can help students learn to gain experience in accordance with learning objectives through process skills.

Process skills are skills that involve all abilities that students have, including intellectual, social and manual skills based on the scientific method built by the students themselves. Bringing up skills in students requires learning that involves the scientific method with the 5M scientific approach (observing, questioning, reasoning, trying and applying). Therefore, process skills are very important for students to have in science learning and concept application.[13]

Concept application is the application of the scientific method and science concepts in everyday life. The application of science concepts involves the application of scientific methods in various situations such as the development of information systems, management of health services and decision making in various fields.[14] In addition to concept application, students also need to have a scientific attitude that is developed early on.

Scientific attitudes refer to attitudes or behaviors that students must have, based on experience and understanding in dealing with new situations or phenomena, similar to the way a scientist researches to gain new understanding.[15] According to Harlen in Anwar, scientific attitude has an important role in the learning process because it includes curiosity, respect for facts, flexibility in thinking and sensitivity to the surrounding environment. Thus, the development of students' scientific attitudes can help students achieve the desired learning objectives. However, in its application, the methods and media used by teachers have not been able to support the understanding of concepts, process skills, application of concepts and scientific attitudes of students in learning science at school.[16]

The results of observations that have been made in class VII MTs PSM Tanen Rejotangan show that students' understanding of concepts and scientific attitudes in science learning still look low. This is evidenced by an interview with the science teacher in class VII. In learning activities, students cannot restate the concepts that have been given by the teacher correctly and also students have not shown scientific attitudes that are in accordance with science learning. In addition, researchers observed that the learning atmosphere in the classroom still looked conventional, only using the blackboard and student textbooks owned. [17]

This research was supported by Diana Prafiska Sari who said that teachers only rely on the lecture method and reading assignments, the learning process is dominated by the teacher, there is no use of media in learning and students who look bored and bored when the learning process takes place. This is followed by the learning style of note-taking and memorization by students. The learning step with the lecture method dominated by the teacher is considered not in accordance with science learning which emphasizes the process of discovery and observation of reality. This causes low understanding of the concept of students. As a result in a short time lost and forgotten from memory. [18]

Based on the background of the above problems, researchers try to apply the use of peer teaching methods assisted by e-Modul media to overcome students' difficulties in obtaining information or knowledge about the Classification of Living Things material that can be used in class VII MTs Tanen, so the research entitled "The Effect of Peer Teaching Method Assisted by E-Modul Media on Understanding Concepts and Scientific Attitudes of Students on Classification of Living Things Material in Class VII MTs Tanen Rejotangan" is important to do.

2. RESEARCH METHODS

This research uses a quantitative approach with a Quasi-Experimental design or pseudo-experimental design. This design has 2 comparison groups between groups that use the peer teaching method with the help of e-module media as an experimental group and groups that use conventional learning or lecture methods and LKS books as a control group. In this study, class VII-A will be used as a control class, which is a class that applies conventional learning using the lecture method and LKS media. While class VII-B as an experimental class which was given treatment in the form of peer teaching method assisted by e-module media. The data sources used in this research are primary data and secondary data. Primary data in this study were obtained from a series of learning activities as well as pretests and posttests conducted by students before and after learning. Secondary data used in this study are in the form of MTs PSM Tanen Rejotangan profiles, student lists, and photos of learning process activities. Data collection techniques using observation and tests. Observation is used by researchers to obtain data on students' scientific attitudes during the implementation of learning with the peer teaching method assisted by e-module media and tests are used to collect data on students' concept understanding results in both experimental and control classes. The data analysis of this study used a prerequisite test. (homogeneity and normality tests) then used hypothesis testing to see temporary conjectures related to differences in the results of the two research groups. After going through the prerequisite test which is normally distributed and homogeneous, T-test, Manova test and Effect Size are carried out to compare the results of two unpaired samples.

3. RESULTS AND DISCUSSION

Based on the results of research on the effect of peer teaching methods assisted by e-module media on students' concept understanding on the material Classification of Living Things get significant results. The significance is evidenced by the results of the T test on the test results in the form of experimental pretest and posttest questions. The T test results show the value of Sig. (2-tailed) 0.000. Based on the decision-making criteria of $0.000 < 0.05$, H_0 is rejected and H_1 is accepted. It can be concluded that there is a positive and significant influence between the peer teaching method and e-module media on students' concept understanding of Classification of Living Things material in class VII. These results can also be seen from the average value of the experimental class in the pretest implementation only got a value of 38.5 then after applying the peer teaching learning method assisted by e-module media the average value of students increased to 81.5 with these results it is very clear that the increase in value before and after giving treatment in the form of peer teaching methods and e-module media. When compared to the value of the control class which was given treatment in the form of lecture learning methods and LKS books, it was still very superior to the experimental class with the control class value only reaching an average posttest value of 66. Suherman suggests peer teaching is a learning method that involves students who are smart, intelligent, have good skills, can help other friends who have not mastered the material other friends who have not mastered the material with the aim that the friend can master the material can master the material. Peer teaching is also able to eliminate the fear, anxiety and awkwardness that occurs during the learning process, so that students who have not mastered the material learning process, so that students who have not mastered the material can dare to express ideas or opinions about something learned. [19] The results of this study are reinforced by research conducted by Aisyah Abidatul et al. The results showed a significant difference in the average student learning outcomes between the control class with the varied lecture learning method and the experimental class with the peer teaching method learning method and the experimental class with the peer teaching method, so that it can be interpreted that the application of the peer teaching learning method has a significant effect on student learning interpreted that the application of peer teaching learning methods has an effect on student learning outcomes on student learning outcomes.[20]

Based on the results of research on the effect of peer teaching methods assisted by e-module media on students' scientific attitudes on the classification of living things, the results are significant. The average value of the experimental group's post observation sheet is 79.07 while the average value for the control class is 77.32. So that the average value of the observation sheet of the experimental group is greater than the average value of the observation sheet of the control group. Based on the results of the T test in chapter 4, the value of Sig. (2-tailed) is 0.000 and 0.015. Based on the decision-making criteria of $0.000 < 0.05$ and

$0.015 < 0.05$, H_0 is rejected and H_1 is accepted. So there is a positive and significant effect of peer teaching method assisted by e-module media on students' scientific attitudes on the material of Classification of Living Things. Through e-modules, students are able to be more creative and innovative in conducting learning activities. In addition, the use of e-modules in the learning process is a solution given to preserve nature and the environment, with the existence of e-modules students can make a positive contribution to reducing the use of paper, students can learn anytime and anywhere to reducing the use of paper, students can learn anytime and anywhere, so as to increase students' respect for nature and the environment so that it can increase students' respect for existing facts and be sensitive to the surrounding environment to the surrounding environment [21] Through utilization of e-modules, students can develop creativity and innovation in the learning process. E-modules allow them to explore concepts and learning materials in a more dynamic and interactive way learning material in a more dynamic and interactive way. With various features available, such as multimedia, simulations, and interactive exercises students can deepen their understanding of the subject being studied."

Based on the results of research on the effect of peer teaching methods assisted by e-module media on students' understanding of concepts and scientific attitudes on the classification of living things, the results are significant. The significance is evidenced by the MANOVA (Multivariate of Variance) test can see the effect of peer teaching methods assisted by e-module media on students' understanding of concepts and scientific attitudes on the material Classification of Living Things. The Manova test is used to measure independent variables against several dependent variables simultaneously. The results of the Manova test also using SPSS 16.0 for Windows obtained a significance value of $0.000 < 0.05$ and $0.015 < 0.05$, so H_0 is rejected and H_1 is accepted, which shows that there is an effect of peer teaching methods assisted by e-module media on students' understanding of concepts and scientific attitudes on the material Classification of Living Things. The results of this study indicate that learning methods and media using peer teaching methods and using e-modules media are better than conventional learning without using peer teaching methods and e-modules media. The peer teaching method helps students express their ideas and ideas without fear and anxiety and learning media is very helpful in reducing the abstractness of a concept of material taught and providing students with meaningful, interesting and fun learning experiences. The characteristics of e-module media, namely Self instruction, Self contained, and Adaptive and user friendly can make it easier for students to understand concepts and also be sensitive to the surrounding environment. The results of this study are reinforced by research conducted by Aulia Novitasari, et al, data analysis using an independent t-test with a significance level of 5%. The results showed the influence of the use of constructivism-based peer tutors on student learning.

4. CONCLUSIONS

The use of the peer teaching method affects the understanding of concepts and scientific attitudes of seventh grade students in the material of Classification of Living Things MTs PSM Tanen Rejotangan which is indicated by the results of the MANOVA test with a Sig value. $0.000 < 0.050$ and $0.015 < 0.050$.

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