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Comparison of Learning Outcomes and Student Activeness in the Use of Guided Inquiry Learning Model with Media e-Module, Learning Videos, and Textbooks

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***Abstract**: Various learning media and models are used to improve learning outcomes and student activities. Current learning emphasizes student activity to achieve good learning outcomes. This research is a descriptive qualitative research that aims to describe the comparison of learning outcomes and student activities in three classes that use the Guided Inquiry learning model with different learning media. The first class uses module media, the second class uses learning video media, and the third class uses textbooks. The subjects of this study were students of the Mathematics Education Study Program at IAIN Ambon who took Differential Calculus, Introduction to Basic Mathematics, and Ordinary Differential Equations courses. Data collection techniques used are tests and observations. The data analysis technique used is data reduction, data presentation, and making conclusions. The results of the study proved that the highest learning outcomes were classes that used Guided Inquiry learning model with module media, then classes that used visual learning media, and classes that used textbook media. The best active learning is in classes that use Guided Inquiry learning model with learning videos media, then classes that use textbook media, and classes that use module media*

***Keywords**: activeness; guided inquiry learning; learning media; learning outcome*

INTRODUCTION

Inquiry learning is defined as the process of formulating problems based on phenomena and finding answers to these problems yourself (Suparno, 2013). Inquiry learning is also interpreted as a process of acquiring knowledge through observation or experimentation to solve problems with the formulation of problems or questions that require the ability to think critically and logically (Muhafid, 2015). Students will be involved in problem solving so as to train their critical thinking skills (Rahmayanti et al., 2019). Meanwhile, Guided Inquiry learning is a learning and teaching process that involves the ability to think systematically to investigate a problem in which we identify and formulate questions related to the problem, formulate hypotheses, collect data through observation or experimentation to answer questions and test hypotheses that have been previously made based on facts and draw conclusions (Jannah et al., 2020). Inquiry learning is an approach that refers to experiences that involve students in constructing knowledge (Zaini et al., 2018).

The Guided Inquiry Learning Model has a positive impact on learning outcomes and student activity. (Ting Wen et al., 2020) stated that Guided Inquiry learning can improve student achievement. This learning model also allows students to be more independent in learning (Yewang, 2017). This learning requires students to be more active in order to be able to seek and explore information and create new knowledge concepts (Mulyana, et al., 2018). The guided inquiry learning model makes students the center of learning (Suantara & Susilaningsih, 2022). This makes students more active.

There is a significant difference in the achievement of students who are taught using guided inquiry learning compared to students who are taught using conventional learning (Margunayasa et al., 2019). The guided inquiry learning model provides opportunities to discuss, seek, and find answers through the formulation of problems that are made so that it is

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expected to increase activity in class (Saekawati & Nasrudin, 2021). Students show good attitudes or activities during the learning process (Aulia et al., 2018).

Electronic modules or e-modules are a form of e-learning media. Lim (2016) states that e-learning uses information and communication technology which allows students to easily access information without being limited by space and time. E-learning can make learning easy to monitor and save expenses (Lim, 2016). The use of e-learning has become a culture in learning activities at the university level (Flynn, 2018). The use of modules in learning mathematics can improve student learning outcomes (Maulana et al., 2022). The use of e-modules can be an effort to increase activity in class (Zaim, 2017). One of the advantages of using e-modules is that they can be used outside of classroom learning (Rosli et al., 2021). This is very beneficial because students have limited time at school, while there are quite a lot of mathematical concepts that need to be mastered (Maulana et al., 2022). Learning modules have a positive effect on students' cognitive levels in understanding material and increasing student learning activities (Logan et al., 2021; Rasmussen et al., 2020). Modules can help students understand concepts both in independent and group learning activities (Simamora et al., 2019).

E-modules are learning media where materials, methods, and evaluation are presented in an attractive and systematic way for those displayed electronically (Darmaji et al., 2019). In accord with (Mulyadi, et al., 2020) stated that the advantages of using e-modules are: (1) clarifying and facilitating teaching materials so that they are not too verbal; (2) increase students' learning motivation; (3) students can learn according to their wishes, needs, and abilities; and (4) students can measure their abilities through the evaluation contained in the e-module. students based on their learning experiences with video-based e-modules, which are considered unique and interesting, have direct feedback with examples that are rich, flexible and efficient, effective and easy to understand in learning mathematical concepts in nature (Nabayra, 2020). E-modules are digital modules that can be considered as media for individual learning because they are equipped with self-study guides. Unlike conventional modules, e-modules embed videos and animations that integrate ICT in the learning process, allowing users to learn actively compared to other modules in word or PDF format (Nabayra, 2020).

Video is one of the fourth generation of educational technologies currently used (Siemens et al., 2015). In accord with (Yousef et al. 2014) stated that video provides an advantage where learning can be done digitally, face to face, or a mixture of both. Sadiq & Zamir (2014) stated that the use of learning videos provides an advantage where students can study again wherever they are. This has a positive impact in training, motivating and stimulating student interest. Thus their participation in class can be more flexible according to their respective learning styles.

Learning videos are a new type of learning resource in mathematics (Wijaya et al., 2020). The learning videos use clear teaching designs, dynamic and attractive images, highlight important points and solve difficult points, effectively helping students with learning difficulties understand basic concepts, master problem solving methods, experience mathematical ideas, and gain achievements in the effective time of student concentration, improving student performance in learning (Huang et al., 2020). Some students have difficulty learning mathematics so they need to study again several times. Learning using videos can make it easier for students so that they can learn many times outside of class time (Tan et al., 2020).

The role of textbooks is very diverse and important in pedagogical activities (Pavešić & Cankar, 2022). Textbooks are learning resources that are compiled based on the needs of the national curriculum which are aligned with the achievements of graduate students and are used in teaching activities. As a learning tool, textbooks provide basic and reliable information for students so that they acquire new knowledge. In addition, it also gives teachers the opportunity to focus attention on improving pedagogics and effective learning (Oates, 2014).

Many researchers have found that textbooks have a substantial impact on student learning outcomes (Sievert et al., 2021). Textbooks can be powerful pedagogical tools for professional teachers, not just teaching texts that teachers don't maximize (Mili & Winch, 2019). In accord with (Siegler & Oppenzato, 2021) conducted research on the use of textbooks in learning. They found that students' understanding depended on the items discussed in the textbook. Student achievement depends on the textbook used. Textbooks that explore a lot of problem-solving exercises have a very positive impact on student achievement. Internationally most teachers state textbooks as their main source (Pavešić & Cankar, 2022).

RESEARCH METHODS

This research is a descriptive qualitative research that aims to compare learning outcomes and student activities in using the Guided Inquiry Model with several different learning media, namely e-modules, learning videos, and textbooks. This research was conducted at the Mathematics Education Study Program at IAIN Ambon. The subject in this study were students in three classes (class A, class B, and class C).

The data in this study were obtained through tests and observations. Tests were carried out to obtain data about learning outcomes, while observations were carried out to obtain data about student activity in the learning process using the Guided Inquiry Model with e-module learning media, learning videos, and textbooks. The test is conducted in writing. The test questions are descriptive.

The data in this study consisted of test scores and observation data. The test result data is measured by the following formula.

$$\text{Final score} = \frac{\text{obtained score}}{\text{maximum score}} \times 100 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Meanwhile, the observed data were analyzed through data reduction, data presentation, and drawing conclusions. Data reduction is the initial stage of the analysis of observational data, namely by sorting out the results of observations related to indicators of student activity. The next stage of data analysis is the presentation of data which is carried out by presenting a list of student final scores and recapitulating student activities during the learning process. Data analysis ends with drawing conclusions which are carried out by summarizing the main points that are at the core of learning outcomes and student activity obtained through analysis of test results and observation data.

RESULTS AND DISCUSSION

This research aims to compare learning outcomes and student activeness in the use of Guided Inquiry Learning Model with Media e-Module, Learning Videos, and Textbooks. Several learning media are used in three different classes, namely e-module media (Class A), learning videos (Class B), and textbooks (Class C). The use of these three media has a positive impact on learning outcomes and student activity. This is as found (Novia et al., 2022; Hoyles et al., 2013) that e-modules are creative and innovative learning media that can increase student activity. In accord with (Sadiq & Zamir, 2014) state that the effect of using modules at the university level is more effective than ordinary learning because students can study again wherever they are.

❖ **Comparison of Student Learning Outcomes in Using the Guided Inquiry Learning Model with Media e-module, Learning Videos, and Textbooks**

The following table describes student learning outcomes in the three classes studied where learning uses the Guided Inquiry Model with different learning media. Class A uses e-module media, class B uses learning video media, and class C uses textbook media.

Table 1. Student Learning Outcomes

Class	Learning Media Used	Average Score	Minimum Score	Maximum Score
A	e-Module	89,07	75,50	97,60
B	Learning Video	87,94	80	93,40
C	Text Book	86,98	73	95

From the table it can be seen that the whole class obtained good learning outcomes with an average score above 85. The minimum score obtained was still not too bad because it was still at a minimum of 73. Only a small proportion of students scored below 80. The highest learning outcomes were obtained by class A using the Guided Inquiry Model with e-module media. The next obtained by class B and C. Class B is a class that uses the Guided Inquiry Model with instructional video media. Class C is a class that uses the Guided Inquiry Model with textbook media.

Table 2. Student Completeness

Class	Learning Media Used	Grade (%)						Completeness (%)
		A	B+	B	C	D	E	
A	e-Module	30%	50%	20%	0%	0%	0%	100%
B	Learning Video	50%	40%	10%	0%	0%	0%	100%
C	Text Book	36%	36%	21%	7%	0%	0%	100%

More specifically, student learning completeness can be seen in the table above. All students in the three classes achieved the completeness criteria. Students are said to get a complete score if they get a minimum grade of C. In other words, it can be said that the grade categories that are said to be complete are A, B+, B, and C. Students who get D and E grades are said to be incomplete or have to repeat the course again. Class A with the e-module learning media achieved good mastery, no students got a C. Likewise with class B which used learning video media. Class C which uses textbook media has 7% of students who get a C grade. But overall students reach the completion criteria.

The use of learning models and media is expected to improve learning outcomes. This study found that the use of the Guided Inquiry Model with e-module media, learning videos, and textbooks had a positive impact on student learning outcomes. This is evidenced by the average score in the three classes reaching more than 85. This is also supported by the fact that all students from the three classes achieved the completeness criteria. Those fact are in line with the statement of (Wen et al., 2020) states that Guided Inquiry learning can improve student learning outcomes.

❖ **Comparison of Student Activeness in Using the Guided Inquiry Learning Model with Media Modules, Learning Videos, and Textbooks**

The activeness of students can be seen from several activities, namely expressing opinions, asking questions, answering questions, and participating in discussions. In general, student activity is very good in using the Guided Inquiry learning model with learning video

media. After that, student activity was good in using the Guided Inquiry learning model with textbook media. Student activity is quite good in classes that use the Guided Inquiry learning model with e-Module media. In this learning model, students will be given the opportunity to solve their problems that have been divided into their respective groups. The teacher only acts as a facilitator and mentor in overcoming student obstacles. Most students are very enthusiastic in this learning.

Mathematics learning always experiences development from time to time. Various learning models and learning media were developed in order to create quality mathematics learning. One of the well-known and widely used learning models is the Guided Inquiry Model. Guided Inquiry Learning is a learning and teaching process that involves the ability to think systematically to investigate a problem. The activities carried out are identifying and formulating questions related to the problem, formulating hypotheses, collecting data through observation or experimentation to answer questions and testing hypotheses that have been previously made based on facts and drawing conclusions (Jannah et al., 2020). This model is very suitable in learning mathematics at the tertiary level because it gives students many opportunities to explore their abilities through the activities carried out during learning. Moreover, mathematics is an abstract science that needs to be understood in depth and thoroughly because every topic in mathematics is related to one another.

The Guided Inquiry Model with media is also able to increase student activity. Lecturers provide many opportunities for students to explore their abilities. The lecturer only acts as a facilitator and guide. This is as stated (Tan et al., 2020) that teachers must play an active role in guiding students, allowing students to actively explore problem solving. It is very important for lecturers to provide many opportunities for students because student activity is not something that is easy for students to achieve (Zaim, 2017). This must be habituated continuously so that students learn actively and get used to being active. Student activity can be seen from several activities, namely expressing opinions, asking questions, answering questions, and participating in discussions (Simamora et al., 2017). Of the three classes studied, all classes showed good activity. This can be seen from the frequent students expressing opinions, asking questions, answering questions, and participating in discussions.

❖ **Student Activeness in Using the Guided Inquiry Learning Model with e-Module Media**

The activeness of students in expressing opinions has progressed from meeting to meeting. At the initial meeting most students experienced confusion, but the longer they understood the material, the easier it was for them to express their opinions. The activeness of students asking questions is not too optimal when compared to other activities. When asked to ask questions, only a few students asked questions. Although few asked questions, the questions asked were quality questions. In general, students do not ask questions because they are confused. Lecturers overcome this problem by asking questions to students. Thus lecturers can know the extent of their understanding. The lecturer will explain things that are not understood. But this did not last long. At the 7th meeting students did not ask too many questions, not because they did not understand but because they understood most of the material.

The activeness of students in answering questions at first was very lacking. This is because students recognize many basic concepts that they do not understand. Moreover, when they were at the senior high school (SMA) level, they were in the Covid-19 era, which caused learning to take place online and was not well controlled. This causes a lot of material that they should have understood since high school they don't understand very well. Lecturers encourage students to be more active in answering questions, where the lecturer conveys that assessment is not only seen from the right or wrong answers but also from the activeness in answering. Thus students try to learn actively to answer.

The activeness of students in discussions is not maximized. In a group, smart students tend to dominate roles and answer independently without involving their group mates. After

each discussion, each group will be asked to present the results of their discussion. The lecturer divides the presentation schedule for each student so that all students experience the experience of being a presenter. Thus, they will be encouraged to be active in discussion activities to understand that they understand all of the material in order to be able to explain it well.

❖ **Student Activeness in Using the Guided Inquiry Learning Model with Learning Video Media**

The activeness of students in this class is the best when compared to other classes. Student activeness in expressing opinions is very good. Students actively express opinions without being asked by the lecturer first. Students are very active in responding to each of the lecturer's questions, whether they can respond correctly or they don't understand. It is very easy for students to understand the material through the videos they watch, the lecturer only needs to give a little additional explanation.

Students also actively ask questions with very good quality questions. They asked about material that was not understood from the learning videos and even asked related material outside the given learning videos. Students are very enthusiastic about learning to the end.

The activeness of students in answering questions is very good. They do the things right. Even though with different types of questions students were able to do it correctly, only a few made mistakes and needed guidance. Students are very challenged and enthusiastic in answering all the questions asked by the lecturer.

Most of the students are active in discussions. When the discussion took place they helped each other explain to their friends who did not understand. Only a small number of students are sometimes passive in discussions. The lecturer will ask his group mates to provide an explanation if anyone doesn't understand. In addition to explanations from lecturers, students will usually find it easier to understand the explanations of their friends.

The use of learning video media also has a positive impact on students. This media is the media that has the biggest positive impact on student activity. The use of learning videos can improve student performance in learning (Huang et al., 2020). In other words, we can understand that the increase in student performance indicates that the student's activeness is certainly good.

❖ **Student Activeness in the Use of Guided Inquiry Learning Models with Textbook Media**

In this class students are quite active in expressing opinions. Many students are always active in expressing opinions. When other friends present the results of the discussion, they will immediately argue if there is an error in the explanation. There are also some students who rarely ask questions. For these students the lecturer will come to them personally, ask about their problems, and give explanations in simple language until they can be understood properly.

The activeness of students in asking questions is very good. When the lecturer gives an explanation they will immediately ask if something is not understood. Likewise, when their friends explain or present the results of the discussion, they will immediately ask questions if something is not understood. The more questions they ask, the more they understand the material. Thus from meeting to meeting, they will quickly understand new material because they already understand the previous material. Meanwhile the activeness of students in answering questions is also good. Lecturers always motivate students to dare to answer without worrying whether their answers are right or wrong. Students are always enthusiastic about answering lecturers' questions confidently, and they will complement each other if their friends' answers are incomplete or wrong.

Most of the students were quite active in discussions. They will solve problems together and ask the lecturer when they experience problems. Only a small number of students were passive in discussion activities because they could not quickly understand the material. The

lecturer will come to the students one by one and provide detailed explanations until they are understood.

Meanwhile the use of textbooks also has a positive impact on learning outcomes and student activity. Even though textbooks are considered old-fashioned and rigid learning media, textbooks are the main resource needed and often used by teachers in learning. This is not only happening at the national level. Internationally most teachers state textbooks as their main source (Pavešić & Cankar, 2022).

CONCLUSION AND SUGGESTIONS

The learning outcomes and student activity in learning using the Guided Inquiry Model with e-module media, learning videos, and textbooks are generally good. The whole class showed positive results as seen from the results of tests and observations. The best learning outcomes are in classes that use e-module media, then classes that use learning video media, and finally, classes that use textbook media. The best student activity is in classes that use learning video media, then classes that use different textbooks, and finally, classes that use textbook media.

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