

The Implementation of E-Module Teaching Materials on Student Learning Outcomes at SMA N 1 BONJOL

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ABSTRACT

This research was motivated by the problem found by the researcher, namely the results of daily physics tests of students in class XI MIPA 1, 2, 3 and 4 that were studied had a fairly low average. Teaching and learning activities at SMA N 1 Bonjol, especially in Physics, still use print media teaching materials. The problem in this study is how learning outcomes in class XI MIPA at SMA N 1 Bonjol in the 2021/2022 academic year using e-module teaching materials using the Edmodo application. This study tries to examine whether there is a causal relationship. The research method used in this study is quasi-experimental research with the Post-test Only Control design. The research population was students of class XI IPA 1, XI IPA 2, XI IPA 3, XI IPA 4 SMA N 1 Bonjol. The research instrument used was a test sheet. The data taken were tested using the t-hypothesis test. The results of this study are significant homogeneity using Levene's test $0.531 > 0.05$ for the experimental class.

Keywords: e-modul, edmodo, Learning Outcomes

A. Introduction

The teaching materials used by teachers are one of the factors that influence students' learning outcomes. A teacher must be able to select appropriate teaching materials and teaching methods. Inappropriateness of the teaching materials used can affect students' understanding, thus impacting their learning outcomes. Furthermore, the use of teaching materials can also affect students' participation and engagement in the learning process, which can, in turn, affect the knowledge acquired by students.

Effective teaching materials for learning include modules. Modules are practical and systematic teaching materials based on a specific curriculum. They contain a set of learning experiences or activities to support the learning process and are designed to enable students to achieve specific learning objectives (Wulandari, 2020).

Effective learning is necessary to develop students' potential. Learning becomes effective when students feel happy, comfortable, and enjoy the lessons, supported by good planning by teachers, including the selection of appropriate teaching materials. Physics learning covers both concrete and abstract concepts. Effective teaching materials that can explain abstract concepts and make the learning process engaging are essential for physics education. Effective physics learning can take place when appropriate teaching materials are applied to influence students' motivation and improve their learning outcomes.

Modules are a learning tool that contains materials, methods, limitations of learning materials, instructions for learning activities, exercises, and evaluation methods designed

systematically. The internet and social media are often used by students. In the learning process, modules are created in electronic form to utilize existing technology. Electronic modules enable students to be more enthusiastic about learning and to better understand the concepts being taught.

In reality, physics science teachers generally tend to use lecture methods. This method is often used due to time constraints, the need to cover the curriculum, and inadequate facilities (Nugraheni, 2017). Learning that involves students less actively results in an imbalance between students' cognitive, affective, and psychomotor skills. Most students are unable to connect what they have learned with how that knowledge will be applied or used (Anggraheni, 2015). This tendency makes students accustomed to using only a small portion of their thinking potential and makes them lazy to think and become accustomed to not thinking independently.

Modules are created to enhance students' motivation and enthusiasm for learning, as well as to improve students' critical and creative thinking skills. Modules allow students to learn more independently according to their abilities, experiences, and mastery of the material, with or without supervision from teachers (Anggraheni, 2015). One form of presenting learning materials in a digital or electronic format is through e-books. An electronic book, commonly known as an e-book, is an electronic recording of information or text presented in a book format.

Learning outcomes involve a change in students' behavior in cognitive, affective, and psychomotor aspects after undergoing instruction. The desired change in behavior is when students have understood the subject matter, are able to achieve competency standards, and meet the minimum passing criteria (KKM) set (Aji & Rusiyanto, 2018). Learning outcomes can be measured through evaluation tests.

In the field, it is a fact that many schools still use print media and have not yet adopted online learning with the assistance of applications. This was evident during an interview conducted by the researcher with a physics teacher at SMA N 1 Bonjol on July 30, 2021, as well as through observations conducted at SMA N 1 Bonjol.

Based on the preliminary study and observations conducted by the author at SMA Negeri 1 Bonjol, the results of daily physics quizzes for students in classes XI MIPA 1, 2, 3, and 4, which were examined, had the following average scores.

Table 1. Percentage of students who completed the Midterm Examination (MID) for Grade XI Science Program at SMA N 1 Bonjol for the Academic Year 2021/2022.

Kelas XI	Jumlah peserta didik	Presentase peserta didik				KKM
		Peserta didik yang tidak tuntas		Peserta didik yang tuntas		
		Jumlah	%	Jumlah	%	
IPA 1	30 siswa	2	6%	28	94%	75%
IPA 2	30 siswa	6	18%	24	82%	

IPA 3	30 siswa	6	18 %	24	82%	
IPA 4	30 siswa	11	33 %	19	67%	

Source: Processed by the Researcher in 2022.

Based on observation, all students already have smartphones, but they have not yet utilized smartphones as a learning tool. Educators and students still use printed materials as a learning medium. Educators also predominantly employ the direct teaching model with lecture methods, occasionally using PowerPoint presentations. This teacher-centered approach tends to make students feel bored and disinterested in participating in the learning process.

E-learning utilizes new multimedia technology and the internet to enhance the quality of learning by facilitating access to resources and services, as well as information exchange and collaboration (Mokhtar, 2017). E-learning is a form of instruction that delivers learning materials to students via the internet or other computer network media. E-learning can operate automatically because it can be integrated with a Learning Management System (LMS) (Saraswat, 2014).

This type of learning allows the delivery of instructional materials to students using various media, one of which is Edmodo. Edmodo is an educational learning network that is free and safe to use. It helps simplify educators in creating and managing online communities, enabling students to connect and collaborate with each other anytime, anywhere (Balasubramanian, 2014).

Edmodo serves as an online learning management system that provides a secure virtual space for both students and educators to share and discuss text, audio, video, files, and images. It supports distance learning processes, aligning with the current regulations of the Ministry of Education.

The role of e-modules here is to serve as teaching materials designed by teachers for students to use in their respective subjects. Developing teaching materials should be a continuous skill improvement for every teacher.

B. METHODS

In this research, an Experimental research method was employed. The experimental method is research designed to determine the existence of the effects of "something" applied to the subjects under investigation. This research aims to examine the existence of a cause-and-effect relationship (Arikunto, 2010). This experimental research applies treatment to the selected sample class and observes the impact of the treatment administered.

The research method used is Quasi-Experimental research, which is essentially similar to pure experiments, with the main difference lying in the control of the most

dominant variable. In experiments studying the influence of learning media on problem-solving skills of high school students, for instance, two classes are chosen as the control group and the experimental group. After conducting research using e-module teaching materials, it was found that students' learning outcomes were better when using e-modul compared to using printed media.

The research design employed is the Posttest-Only Control research design. This involves selecting subjects from one control class and one experimental class. The experimental class undergoes treatment using the e-modul system through the Edmodo application, while the control class uses the conventional learning system with printed media.

Table 2. Research Design

Kelas	Perlakuan	Posttest
Kontrol	-	T
Eksperimen	X	T

Explanation:

X : The treatment given to the experimental class using e-modules on the Edmodo application

T : The final test given to the experimental class and the control class

In this research, several types of tests are used with SPSS, including:

- a) Conducting a homogeneity test aims to determine whether the sample classes have homogeneous variances or not.
- b) Performing a test of mean equality aims to determine whether the populations have equal means or not. The test for mean equality uses a one-way ANOVA.
- c) If the population is normally distributed, has homogeneous variances, and has nearly equal means, then the sample can be randomly selected.

Research instruments are data collection tools used in a study. The instruments used in this research are questionnaires and observations.

C. Results and Discussion

The research discusses the implementation of e-modules using the Edmodo application in relation to the learning outcomes of students. The study was conducted at SMA N 1 Bonjol Pasaman in classes XI IPA 1, XI IPA 2, XI IPA 3, and XI IPA 4. Through

these four classes, consisting of two experimental classes and two control classes, the post-test only control method was applied.

In this study, the researcher selected a sample size of 30 students per class. The researcher administered a set of post-test questions, comprising 5 questions for each sample. The experimental classes received special treatment, involving the use of e-modules through the Edmodo application. The instruments employed included post-tests, affective observation, and observation sheets. The dependent variable was the students' learning outcomes, encompassing the cognitive aspect.

On the other hand, the control classes utilized the discussion and lecture methods, receiving treatment through discussion and lecture models. The instruments used also included post-tests, affective observation, and observation sheets. The dependent variable in this case covered students' learning outcomes in the affective, cognitive, and psychomotor aspects.

In this chapter, the researcher will discuss the research findings, the results of hypothesis testing/answers to research questions, the discussion, and the limitations of the study.

1. Learning in the Experimental Class

The implementation of learning in the experimental class began with activities such as reciting a prayer, taking attendance of students, providing an introductory activity, motivation, and stating the learning objectives. Subsequently, the researcher introduced the methods and steps of learning using the e-module instructional material.

2. Learning in the Control Class

The implementation of learning in the control class involves several activities, including reciting a prayer, taking attendance of students, providing an introductory activity, motivation, and stating the learning objectives by the researcher.

- a) Observing, students observe the demonstration that is conducted, then they ask questions about the demonstration that has been performed.
- b) Questioning, students respond to the educator's information by asking questions.
- c) Trying, students work together with their group as per the educator's guidance, collaborating with group members to solve the problems given by the educator.
- d) Associating, within their group, to solve the problems given by the educator.
- e) Communicating, each group designates a representative to present the results of their group discussion and answer questions from the educator in front of the class. Other students provide feedback and questions to the presenting group. Students pay attention and provide reinforcement to the conclusions presented by students. One student summarizes the material learned in front of the class,

then receives recognition from the educator. The educator then adds a summary to conclude the lesson and wraps up the learning process.

3. Learning Outcomes

The concept of learning is the process by which an individual makes efforts to acquire a new overall behavior change as a result of their own experiences in interaction with their environment.

Student learning outcomes are the abilities acquired after going through the learning process. The method used to determine whether the achieved learning outcomes align with the desired objectives is through learning evaluation. Evaluation is the information processing process to assess how effectively a learning program is applied to students. In fact, evaluation can serve as a way to measure the level of students' mastery of the taught material.

Learning outcomes are a set of competencies acquired by an individual after undergoing the teaching and learning process over a specific period. Cooperative learning, on the other hand, is one of the teaching models that place students in small groups with diverse backgrounds and abilities.

Therefore, learning outcomes or learning achievements refer to the actual level of achievement displayed in the form of behavior, including cognitive, affective, and psychomotor aspects, and can be seen in the form of habits, attitudes, and appreciation consistent with the predefined objectives. In essence, it is a change in behavior as a result of learning in the broad sense, encompassing the cognitive, affective, and psychomotor domains.

Learning outcomes or achievements represent the realization or expansion of an individual's potential skills or capacities. One's learning outcomes can be observed through their behavior, whether in terms of mastery, knowledge, critical thinking skills, or motor skills.

Based on the research conducted, it can be seen that learning using e-modules in the Edmodo application resulted in a higher average learning outcome for students compared to conventional learning in classes XI MIPA 1 and XI MIPA 2 at SMA N 1 Bonjol.

The description and analysis of data revealed that the assessment of students' learning outcomes was conducted by providing five multiple-choice questions during the post-test or final test in both the control and experimental classes.

Before the research was conducted, it was necessary to determine whether the initial abilities of both groups of study samples were the same or not. Based on the calculations of normality and homogeneity tests on the initial scores of both classes, it was found that they had a normal and homogeneous distribution. This suggests that the initial abilities of the students before the implementation of instructional

materials in the form of e-modules and conventional methods were equivalent or the same.

In this research, the implementation of e-modules was assisted by using a teaching model. The teaching model in this study involved instructing students to use a smartphone application and open the Edmodo application to access the e-modules within it.

The application of this teaching model enabled students to acquire the ability to use e-modules as learning resources, whether related to the curriculum's standard material or not. In this learning environment, students found it easier and more relaxed to engage in learning because the medium used was e-modules accessible on their smartphones. Implementing this type of learning encourages students' curiosity in discovering things they want to know.

Based on the research findings, it can be observed that the application of e-modules led to better learning outcomes for students compared to the conventional method in classes XI IPA 1 and XI IPA 2 at SMA N 1 Bonjol.

The description and analysis of the data revealed that students taught using e-module instructional materials had better learning outcomes compared to the conventional method. The homogeneity test results indicated that the data distribution was homogeneous, as evidenced by a Levene's test result of $0.531 > 0.05$ for both the experimental and control classes. This means that the sample classes came from a population with a homogeneous distribution.

As for the population normality test, which essentially aims to determine whether the population follows a normal distribution or not through standard testing conducted using SPSS 23 software, it was done using the Kolmogorov-Smirnov test with the condition: If the Sig. Kolmogorov-Smirnov value > 0.05 , then the data is normally distributed, and conversely. The calculation results of the Kolmogorov-Smirnov test showed that the Kolmogorov-Smirnov Z Asymp. Sig values were 0.106, 0.025, 0.009, and 0.026 > 0.05 , indicating that the data is normally distributed.

Tabel 3. Uji Normalitas

	Eksperimen 1	Eksperimen 2	Kelas Kontrol1	Kelas Kontrol 2
N	30	30	30	30
Normal Mean	86.83	86.50	63.00	63.00
Paramet Std. ers ^{a,b} Deviatio n	8.251	7.895	10.389	11.265
Most Absolute	.145	.171	.186	.170
Extreme Positive	.121	.107	.124	.134

Differences	-.145	-.171	-.186	-.170
Test Statistic	.145	.171	.186	.170
Asymp. Sig. (2-tailed)	.106 ^c	.025 ^c	.009 ^c	.026 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

The calculation results of Kolmogorov-Smirnov yielded values of Kolmogorov-Smirnov Z Asymp. Sig 0.106, 0.025, 0.009, and 0.026 > 0.05. Therefore, the data is normally distributed.

This contains an explanation that e-module instructional materials play a crucial role in achieving educational goals, as this medium, with its guided inquiry model, provides direction on actions and how those actions should be carried out to attain the desired objectives.

Based on the tests of normality and homogeneity of variances that have been conducted, it turns out that both sample classes exhibit normal distribution and have homogeneous variances. Thus, to determine whether the hypothesis is accepted or rejected, a one-way ANOVA test is employed. The testing criteria for this hypothesis test are as follows: if the Sig. value < 0.05 and the f-value > the f-table value, then H₀ is rejected, and H_a is accepted. After conducting the hypothesis test, the data obtained are as shown in the following table.

Tabel 4. Uji anova satu arah

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
Kontrol	30	61,5	2,05	0,333621
Eksperimen	30	61,75	2,058333	0,43398

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0,001042	1	0,001042	0,002714	0,958631	4,006873
Within Groups	22,26042	58	0,3838			
Total	22,26146	59				

The results of this study are relevant to research conducted by Nita Sunarya Herawati and Ali Muhtadi, which indicated that interactive electronic modules (E-

Modules) showed a difference in learning outcomes between the pre-test before using the E-Module and the post-test after using the E-Module with a significance level of > 0.05 . This study is also in line with the research conducted by Hariani Harjuna in 2022, which found an improvement in learning outcomes in the highest range of 76% (Harjuna, 2022). It is also consistent with the research conducted by Yuyun Dila Syaputra in 2017 on the Implementation of the I-Care Strategy with the help of E-Modules to Improve Learning Outcomes in Solid Geometry, which showed successful learning in the learning process and learning outcomes (Syaputra, 2017).

This underscores the importance of E-Module instructional materials in achieving educational goals. This medium, with its guided inquiry model, provides direction on actions and how those actions should be carried out to attain the desired objectives.

D. Conclusion

Based on the data analysis results obtained, the experimental class showed greater improvement than the control class. Based on the hypothesis test conducted, it was found that the calculated t-value $>$ the t-table value, or $0.9586 > 0.05$. Therefore, it can be concluded that the learning outcomes of students who applied E-Module instructional materials through the Edmodo application were higher compared to students who followed conventional teaching methods in the teaching process at SMA N 1 Bonjol.

The research results indicate that the implementation of E-Modules in enhancing students' learning outcomes has been successfully achieved. This has implications that E-Module instructional materials play a significant role in achieving educational objectives because they provide guidance on actions and how those actions should be carried out to attain the desired goals. It is expected that this can enhance the quality of cognitive abilities in alignment with the educational objectives.

There are several suggestions and recommendations from the researcher regarding this study and its direct relevance to the physics teaching and learning process at the high school level. These include:

1. Educators should consider implementing E-Modules as instructional materials for other subjects in SMAN 1 Bonjol.
2. To achieve maximum results and more effective and efficient learning, teachers should make use of the IT facilities provided by the school.

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