

The Effectiveness of Using Interactive Electronic Modules on Student Learning Outcomes in Education Innovation Course

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Abstract - This study aims to determine the effectiveness of the application of Interactive electronic modules on learning outcomes in educational innovation courses. This type of research is quantitative research with experimental methods and pre-experimental design, with the form of one-group treatment, pre-test-post-test. When experimenting, before entering the learning material, the questions were given (Pre-test), and After the material, activities were given more questions (Posttest). The population in this study were 42 6th-semester students of the Baturaja University Education Technology Study Program 2018/2019 academic year. While the sample used is class 6.1 as many as 20 students as the experimental class with a purposive sampling technique. Test results before the application of Interactive electronic modules, the average value is 60.5. While the test result data afterward is 81.5. This proves that there is an increase in student learning outcomes after the application of the Interactive electronic module. After testing the hypothesis, the value t_0 is 17.576. Based on table "t" with df 19, the price "t" is obtained at the level of 5% = 2.02 thus $17.576 > 2.09$. From the calculation results, it is proven that t_0 is greater than t-table. So that the working hypothesis (H_a) is accepted and the null hypothesis (H_0) is rejected. So it can be concluded that the application of Interactive electronic modules on educational innovation courses is effective to use.

Keywords: *electronic modules, learning outcomes, education innovation*

I. INTRODUCTION

The development of information and communication technology now affects all areas of life. One such part is the field of education and learning. The quality of learning in the educational innovation course is inseparable from learning methods and teaching materials used in delivering learning material to students. Teaching materials can be in the form of information, tools, or texts that are arranged systematically. Where the

contents display the number of complete competencies that will be mastered by students and can be used in the learning process to learn the implementation of learning [11]. One part of the teaching material is the module. Modules are teaching materials that are arranged systematically, with language that is easily understood by students according to their level of knowledge and age, so that students, in this case, are students able to learn independently. Modules must also be made using language that is appropriate to the age level of students who use it [14]. The module is a complete teaching unit designed to be used by an educator.

The learning process that takes place in an educational innovation course at the University of Bali's technology education study program still uses a print module, makes it difficult for students to bring the print module. The times and technology allow students to store the blade in a laptop or handphone. From this problem came the idea to turn the print module into an interactive electronic module. Interactive teaching materials are creative, innovative, and adaptive teaching materials for technological developments and can make students happy and comfortable so that learning becomes effective and efficient [11]. Learning requires fun and empowering interactions. Learning that uses information and communication technology can help educators in delivering material and students in understanding the learning material [5]. With teaching materials with multimedia facilities, including interactive e-modules, the content can be modified to be more attractive [8]. Interactive e-module teaching material is one of the teaching materials whose publishing process in digital form consists of text, images, or a combination of both. Electronic modules are teaching materials that are presented systematically so that their use can learn with or without a facilitator or lecturer [3]. One of the criteria of the interactive E-Module is self-

instructional, which makes the teaching material able to teach students independently.

The low student learning outcomes also motivate this research in the educational innovation course. From the needs analysis done, one of the factors is the need to apply technology-based learning models that enable students to learn effectively and efficiently without having to bring printed teaching materials. From these problems, the development of electronic module-based teaching materials was carried out. The focus of research on how effectively the electronic module-based teaching materials applied to learn in the education innovation course.

The effectiveness of interactive electronic modules has also been investigated [15],[13],[12]. These studies indicate that effective modules are useful in learning. sources that have been studied, this research is carried out with the title "The effectiveness of interactive electronic modules on education innovation course." The study aims to determine the effectiveness of interactive electronic module teaching materials so that the results of this study can provide benefits to students, whether effective or not, be used in learning in educational innovation course.

II. METHODOLOGY

A. Research Methods

This type of research is a quantitative descriptive. The research design used in this study is One-Group-Pretest-Posttest Design [16]. The data collection technique in this study uses a test that is giving a pre-test to students before the treatment is done by using electronic module-based teaching materials. After treatment, students will be given a post-test again to see the effectiveness of the application of electronic modules. Data analysis uses statistical tests (t-test) to see the hypothesis as a basis for conclusions in this study.

B. Subjects and Research Object

The population in this study was the 6th-semester students of 2018/2019 in the Educational Technology study program at the University of Baturaja, who participated in the Education Innovation course, totaling 42 students. The sample in the study is class 6.1, as many as 20 students.

C. Operational Variables

Research variables are everything in which form is determined by researchers to be studied to obtain the required information. The variables used in this study are the Free Variables in the form of interactive electronic module teaching materials, and the dependent variable is student learning outcomes.

D. Hypothesis Testing

The technique used is by using the t-test using SPSS. The formulation of the hypothesis is as follows:

- H_0 : There is no difference between the average value of the pre-test and post-test results of student learning. The meaning is not significant, and interactive electronic module teaching materials are not effective to be used in learning Education Innovation course.
- H_a : There is a difference between the average value of the pre-test and the post-test of student learning outcomes. This means that the results show significant and effective interactive electronic module teaching materials to be used in the learning Education Innovation course.

Guidelines for decision making based on the significance value (Sig.) of SPSS output are as follows:

- If the value of Sig. (2-tailed) < 0.05 , then H_0 is rejected, and H_a is accepted.
- Conversely, if the value of Sig. (2-tailed) > 0.05 , then H_0 is accepted, and H_a is rejected.

III. RESULT

A. Average Value of the pretest and post test

TABLE I. AVERAGE VALUE

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Pre_Test	60.5000	20	7.97199	1.78259
Post_Test	81.5000	20	6.99624	1.56441

Output in table 1 shows a summary of the descriptive statistical results shown from the pre-test results and post-test learning outcomes. For the pre-test value, the average value or mean is 60.50. Whereas for the post-test value, the average value or mean is 81.50. The number of samples or students studied amounted to 20 people for the value of Std. Deviation or Standard Deviation at the pre-test is 7, 97, and the post-test is 6.99 because the average value of the pre-test $<$ post-test is $60.50 < 81.50$. It means that descriptively there are differences in the average value of the pre-test and post-test results of student learning.

TABLE II. HYPOTHESIS TEST (T-TEST)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre_Test- Post_Test	-21,00000	5,34347	1,19484	-23,50082	-18,49918	-17,576	19	,000

Based on the results above, it is known the value of Sig. (2-railed) is 0,000 <0,005, Sig. (2-railed) is 0,000 <0,005. The value of df is 19, and the t-table value is 2.09. Value of t-count 17.576 > 2.09. So that it can be concluded that there is a difference between the average value of the pre-test and post-test student learning outcomes. This means that the results show significant and effective interactive electronic module teaching materials to be used in the learning Education Innovation course.

IV. DISCUSSION

Teaching material is systematically compiled lecture material, which is used by lecturers and students in the learning process [9]. Teaching materials for students become one of the factors that can help in understanding the material in learning and can improve learning outcomes. Teaching materials that have been studied by students are still in the form of printed teaching materials. Printed teaching materials in terms of efficiency can be said inefficient because students have to spend additional funds to get it. The development of science, technology, and information brings changes and new paradigms in learning materials and learning methods [4]. Technology has become a significant need at this time, especially students. The research conducted shows that Students are active in searching for literature on topics that will be studied using electronic devices such as mobile phones, laptops, and others [10]. The use of technology is very contrasted if used for the development of teaching materials that can help efficiency in terms of content and student learning time. From the research that has been done by looking at the needs analysis in the educational innovation course, about 82% of students are interested in more varied teaching materials based on technology. One teaching material that can choose is E-Module [17]. The utilization of information technology in learning will create an exciting and meaningful learning process for students [7].

With the development of technology, print modules can be changed into a more interactive electronic module that is package was in a digital format. This interactive electronic module can change the presentation of modules that are

usually print into modules that can be reading without having to be print by utilizing technological devices that have evolved, such as computers and laptops [15]. In the course of educational innovation itself, the development of teaching materials based on interactive electronic modules has been carried out. In this research, we will see how effective the module-based electronic teaching materials are in the course of educational innovation [18].

The use of online learning resources is more effective than traditional methods by delivering lectures in front of the class [2]. However, not all locations can be accessed online. Certain areas do not yet have access to study online. Then it will be more effective if the teaching material can be accessed online and offline. The respondents felt that the E-module would be suitable in assisting students in learning the subject [6]. E-Module is the source learning is also used as a medium to stimulate the process of deep learning, cultivating students to read and learn independently [1]. E-Modules considered more attractive because they have several multimedia elements that will make learning more enjoyable.

V. CONCLUSIONS

This research is a continuation of the development of electronic module-based teaching materials, which have previously carried out needs analysis that illustrates the needs of students for technology-based learning. One of the right ways to answer this problem is to develop teaching materials based on electronic modules. This electronic module has tested for effectiveness, supported by several theories. The results of the study indicate that electronic module-based teaching materials, effective to be applied to learning, especially in educational innovation course. It is hoped that in future studies, this E-Module can apply to other subjects.

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