Development of an Inquiry-Based E-Module Assisted by Google Classroom to Improve Learning Outcomes of Class XI Social Students at SMA WR Supratman 1 Medan TP 2021/2022.

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Abstract. The purpose of this research is to develop an inquiry-based e-module that can improve student learning outcomes. Research and development (R&D) of the ADDIE model with qualitative and quantitative analysis techniques. The results of the study indicate that the development of e-modules with qualitative analysis, namely the results of material experts are 91 percent very good, results from media experts are 86 percent very good, the results of design experts are 93 percent very good, and the results of teacher responses are 95 percent very good. While the validation results from students were carried out three times, namely the individual test 95 percent very good, the small group test 95 percent very good, and the large group test 97 percent very good. After the product has been successfully developed, then experimental research, namely the use of inquiry-based e-modules effectively improves student learning outcomes with a one-way t-test, the value becomes 0.000 which means less than = 0.05 so it can be concluded that the posttest value of the experimental class is greater compared to the control class posttest scores, so it can be concluded that the inquiry-based e-module development is effective in improving student learning outcomes.

Keywords: E-Module Development, Inquiry, Learning Outcomes

1 Introduction

One strategy that a teacher can do is make teaching materials. Teaching materials are materials in the form of information, tools, and textbooks that are arranged systematically based on the competencies that students will learn and use in the learning process to understand and implement to achieve learning objectives (Prastowo, 2013). One form of teaching materials that is very important to be developed at this time is the module. Prastowo (2013) module is a set of teaching materials that are made systematically and directed so that their use can be understood without a teacher. Module teaching materials can help students understand the learning material more easily when the teacher explains it again and even students are also able to understand the learning material even if it is not explained by the teacher. In line with the development of technology, the modules used in the learning process are growing and innovating, for example teaching materials from print modules to electronic modules or often referred to as e-modules.

Teaching materials in the form of e-modules in this current era should be used in the learning process by every teacher. Of course, it has become a demand for technological developments that can make it easier for students to learn, for example when studying at school using a smartphone or computer. On the other hand, learning can also be carried out using a distance system (online) as a form of using technology, especially in current learning which is still online due to the COVID-19 pandemic which makes learning activities still online.

Based on a needs analysis conducted by researchers at the Private High School WR Supratman 1 Medan, it was found that the teacher of economics subjects when delivering learning materials still focused on printed books distributed from schools, teaching materials like this were not optimal to meet the needs of students. For teaching materials in the form of e-modules, it is not yet available, even in online learning situations like now, economics teachers only deliver lecture material through the zoom application and assignments via Google Classroom, even though the learning process like this is less interesting, students get bored easily, and tend to be passive. Furthermore, students do not understand the economics learning material, especially the material that is calculated. Reading printed books from school, students also do not understand because the explanations in the book are incomplete and the language is difficult for students to understand. Students also said that online economics learning never applied a learning model, so teachers were considered less creative in delivering learning.

Therefore, researchers are interested in developing economic learning e-modules to support more effective and efficient learning activities in online learning today. The e-module that will be developed by the researcher is an e-module in the form of a flipbook. Furthermore, the pattern of e-module development uses an inquiry model as a form of student-centered learning and also a learning model that developed in the 21st century. Sutrisno (2008) suggests that the inquiry learning model is to instill the foundation of scientific thinking in students, so that in this learning process students can learn more on their own and develop problem solving creativity. In the learning process at school, researchers use the help of the google classroom application to test the products developed. This is done because students often use the Google Classroom application in online learning activities.

E-Module Development

According to Priyanthi (2007) e-modules are teaching materials in electronic form that can be read on computers or other technological applications designed with the required software. According to Limatahu (2017) e-modules are learning that can be implemented as independent learning resources that can help students improve their competence or cognitive understanding. Meanwhile, Suarsana and Mahayukti (2010) e-module is a technology-based module that is interactive, which contains images, audio, video and animation for display, and is equipped with exercises or evaluations. So it can be concluded that e-modules are electronic media that can be studied anytime and anywhere as a source of independent learning equipped with video, audio and animation that can make the learning process more interesting.

Inquiry Learning Model

According to Trianto (2011) inquiry means an examination or investigation question. Meanwhile, Alberta (2004) believes that inquiry learning is a process in which students learn, ask questions, conduct extensive research, and then build new understanding, understanding, and knowledge. It can be concluded that the inquiry model is a student-centered teaching that requires students to process messages so that they acquire everything that is known, skills, and values that can make learning more meaningful and can improve student learning outcomes.

Sanjaya (2012) describes the steps of inquiry learning as follows:

1. Orientation
   The orientation step is an interactive method used in responsive learning so that students are ready to carry out the learning process, explaining topics, objectives and learning outcomes that must be carried out by students to achieve learning goals.
2. Formulate the problem
   The step of formulating the problem is a step that brings students to problems that contain puzzles. The problems presented are problems that challenge students to think and try to solve the puzzle.
3. Propose a hypothesis
   The hypothesis step is a step that contains a temporary answer to a problem that is being studied. It is a provisional answer, a hypothesis that needs to be tested for truth.
4. Collecting data
   The step of collecting data is a step in the form of activities to collect the information needed to test the hypothesis that has been proposed
5. Test the hypothesis
   In the step of testing the hypothesis, it means that the step in the form of a process of determining the answer that is considered acceptable according to the data or information obtained based on data collection
6. Formulate conclusions
   In the step of formulating a conclusion, it means that the step in the form of a process of describing the findings obtained based on the results derived from hypothesis testing.

Google Classroom app

The Google Classroom application is a platform application that is used for the learning processonline learning. This application was originally designed on a web-based basis that can be used for online learning for students as well as students. Along with the times, this application can also be used through mobile learning which makes it easier for students to use this application in the learning process, this is also because the average student already has a mobile phone as a learning support. This is also supported as part of technological developments that can be used in the field of education as a learning process that is easy to use anytime and anywhere. In addition, this application is also very supportive in online learning at this time due to the pandemic which has resulted in schools having to implement online learning.

Economics Learning Materials

Development of inquiry-based e-modules assisted by Google Classroom for tutorsEconomics lessons at WR Supratman Private High School, Medan for class XI Social Sciences for the academic year 2021/2022 are in accordance with the odd semester economics subject matter in the 2013 curriculum economics syllabus, namely basic competencies in analyzing concepts and methods of calculating national income, and presenting the results of calculating national income. The learning indicators developed in the e-module are:
a. Understand the meaning of national income
b. Understanding the benefits of national income
c. Analyzing the components/concepts of national income
d. Analyzing the method of calculating national income
e. Explain the concept of income per capita
f. Understand the concept of income distribution
g. Make a pattern of the relationship of information/data obtained to conclude about the concept and method of calculating national income.

2   Research Methods

This research is a research and development (R&D) with the ADDIE model that develops teaching materials for economics subjects, namely inquiry-based e-modules for students of class XI social studies. The purpose of this development research is to determine the feasibility and effectiveness of inquiry-based e-module development to improve student learning outcomes. This research was carried out at SMA WR Supratman 1 Medan for the academic year 2021/2022 on economics class XI social studies. This research is planned to be carried out in August 2021 which will be adjusted to the school calendar. The technique of collecting data is through observation and validation questionnaires from media experts, design experts and material experts. Furthermore, the teacher's response questionnaire, and student response questionnaires for up to three groups and followed the stages of research on the development of the ADDIE model.

3   Results and Discussion

The development of e-modules has been developed starting from the stage of analyzing the needs of students and teachers, designing and designing the e-module framework, product validation by experts by three experts, namely material experts, design experts and media experts as well as teacher response questionnaires and given improvements/revisions to the product. . Then it goes into individual product trials, small group and large group product trials and field revisions to produce e-modules that are suitable for use in the learning process.

In developing inquiry-based e-module products on economics subjects for class XI IPS, there has been a revision from material expert lecturers, namely the need to add case examples to enrich the discussion and apply and add the latest data in the e-module. The revisions from the media expert lecturers were adjusting the background color with the text color, replacing the learning video with its own video, clarifying the appearance of the e-module writing. The two suggestions from the expert validation have been improved and can be carried out to the next stage.

For the results of inquiry-based e-module validation from material expert validation, the indicator of the suitability of the material description aspect to competence has an average percentage of 90 percent with very good criteria. The indicator for the accuracy of the material has an average percentage of 100 percent with very good criteria. The indicator for the presentation of inquiry-based material has a percentage of 92 percent in the very good category. The indicator of the presentation technique aspect has a percentage of 92 percent in the very good category. The indicator of the completeness aspect of the presentation of the section has a percentage of 87 percent with a very good category. The average percentage of all indicators is 91 percent in the very good category. This means that the inquiry-based economics E-module in economics class XI developed is feasible to be tested in the field.

For the results of inquiry-based e-module validation from media expert validation, namely the programming aspect indicators have an average percentage of 87 percent with very good criteria. The indicator for the feasibility aspect of the content of the E-Modul has a percentage of 85 percent with very good criteria. The average percentage of all indicators is 86 percent with a very good category. This means that the inquiry-based E-Module in economics class XI developed is feasible to be tested in the field.

While the results of inquiry-based e-module validation from design expert validation, namely the preliminary aspect indicator has an average percentage of 90 percent with very good

criteria. The indicator of the objective aspect (learning outcomes) has an average percentage of 95 percent with very good criteria. The final test aspect indicator has an average percentage of 95 percent with very good criteria. The indicator of the learning experience aspect has an average percentage of 90 percent with very good criteria. The indicator of the learning resource aspect has an average percentage of 93 percent with very good criteria. The average percentage of all indicators is 93 percent with very good criteria. This means that the inquiry-based E-Module developed is worthy of field trials.

For the validation of the inquiry-based e-module from the teacher's questionnaire, the average score of 95% was obtained for the feasibility of the e-module and was in the very good category. The results of the individual test of the inquiry-based e-module obtained an average score of 95% for the feasibility of the e-module and is in the very good category. Meanwhile, the results of the small and large group test questionnaires for student responses were in the very good category. Thus, the inquiry-based e-module assisted by Google Classroom in economics has met the feasibility element and can be applied in student learning activities.

After the e-module product meets the feasibility element, then the product is implemented to determine the effectiveness of the e-module. Prior to the implementation of the e-module, a pretest was first conducted for the two sample groups that had been determined, namely class XI IPS1 was referred to as the experimental class, while class XI IPS2 was referred to as the control class. Each of the two sample classes was given the same pretest questions, namely 20 multiple choice questions. The results of the pretest and posttest are presented in the table below:

Table 1. Pretest and Posttest Results

No.	Class	Average Pretest Score	Average Posttest Score	KKM Achievement > 65 (%)
1.	Experiment Class	53	79	100%
2.	Control Class	52	62	46.67%

Based on table 1 above, the pretest results of the experimental class students have an average score of 53. Meanwhile, the control class has an average score of 52. From the table, the difference between the average scores of the experimental class and the control class is not much different. After the pretest was carried out, the two samples were treated differently, namely the experimental class using an inquiry-based e-module that had been developed, while the control class was only given the treatment of economic class XI social studies textbooks given by the school to students.

The posttest results show the average value of the experimental class is 79 with a KKM achievement of 100%, while the average score for the control class is 62 with a KKM achievement of 46.66%. Therefore, students in the experimental class had higher learning outcomes than the control class.

For the prerequisite analysis test, then the two samples were tested for normality to find out whether the two samples came from data that were normally distributed. With the help of the following SPSS applications, they are presented in the table below:

Table 2. Normality Test for Experiment Class and Control Class

Class	Data	Sig	□	Description
Experiment	Pretest	0.200	0.05	Normal Distributed Data
	Posttest	0.108	0.05	Normal Distributed Data
Control	Pretest	0.166	0.05	Normal Distributed Data
	Posttest	0.122	0.05	Normal Distributed Data

From table 2 above, it shows that the results of the pretest and posttest data for the experimental class and control class have a probability value > 0.05, the experimental pretest data is $0.200 > 0.05$, the experimental posttest data is $0.108 > 0.05$, the control pretest data is that is $0.166 > 0.05$ and the control posttest data is $0.122 > 0.05$. Thus it can be concluded that the results of the pretest and posttest of the two classes are normally distributed. Furthermore, the homogeneity test is presented in the table below:

Table 3. Homogeneity Test

Levene Statistics	df1	df2	Sig.
.797	3	120	.498

Table 3 above shows the results of the homogeneity test using the Levene method, the significance value of the experimental pretest and control pretest results is 0.498. Therefore, the sig value of $0.498 > 0.05$, it can be concluded that the two samples of the experimental class and control class are homogeneous. Furthermore, to test the hypothesis using the Independent Samples Test, namely the sig.2-tailed value of 0.000 then the value is divided into two because the t-test is carried out in one direction, the value becomes 0.000 which means less than = 0.05 so it can be concluded that the posttest value the experimental class is greater than the posttest value of the control class.

4   Conclusion

The inquiry-based e-module development has been developed through the ADDIE development model. This e-module has been developed starting from the stage of analyzing the needs of students and teachers, designing and designing the e-module framework, product validation by experts by three experts, namely material experts, design experts and media experts as well as teacher response questionnaires and given improvements/revisions to the product. . For the results of inquiry-based e-module validation from material expert validation, namely 91 percent in the very good category, media expert validation 86 percent in the very good category, validation by design experts 93 percent with very good criteria. For the validation of the teacher's response questionnaire, the results obtained an average score of 95% in the very good category, the individual test average score of 95%, and the results of the small and large group test of student responses obtained an average result of 97 percent in the very good category. The inquiry-based e-module is quite effective in improving student learning outcomes with an average n-gain of 56.8%. Meanwhile, the average n-gain score for the control class is 20.5% in the ineffective category for improving student learning outcomes. . This is in line with research (Sarah (2016) the n-gain results show that the increase in student learning outcomes using inquiry-based modules (64%) is greater than students who study using conventional modules (56%). Another research that supports is Pratiwi (2019) guided inquiry-based module trials can improve student learning outcomes by 80%.

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