DEVELOPING E-LEARNING MEDIA WITH MOODLE FOR STUDENT OF CLASS VII ON SUBJECT MATTER OF TRIANGLE

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ABSTRACT

Teachers are required to innovate in the learning process, which is a determinant of students' ability to understand the classroom materials. One of the innovations is to make learning media, but in reality, the availability of available media is still limited. The research aims to design, create, and describe whether or not e-learning based mathematics learning media use moodle on triangle material for grade VII students. This research is focused on the development of mathematics learning media, which is packaged in internet form. This development research using the ADDIE development model (Analysis, Design, Development, Implementation, Evaluation). His research subjects are material experts, media experts, and students response of Junior High School (SMP) 1 Muhammadiyah Prambanan and SMP Muhammadiyah 17 Prambanan Klaten. Data collection techniques used interviews, questionnaires, and observations. The research instruments used are observation guides, interview guides, and questionnaires to assess the learning media that has been developed. The data analysis technique uses qualitative. This research has succeeded in developing math learning media that have excellent quality (SB). The average score of expert material assessment 74.3333, and the average score of media expert assessment results was 113.33. While the student response score 83.043 with scores on small class trials and large class trials. So the average score of idealization is 270,706 from the ideal maximum score of 315. Based on these assessments, this math learning media is worthed to be used as a learning resource.
Keywords: Learning Media, E-Learning, ADDIE.

INTRODUCTION

In this all-technological era, the prime mover for advancing a nation that can compete is quality human resources. In this connection, education plays an important role in preparing quality human resources. To create quality human resources, professional teachers' role is needed, which is a determinant of the classroom's learning process and learning. This is as stated in Article 1 paragraph 1 of RI Law No. 14/2005, namely Teachers are professional educators with the main task of educating, teaching, guiding, directing, training, evaluating, and evaluating students in early childhood education through formal, primary education and secondary education.

In connection with this, the teacher must innovate in the learning process, which is a determinant of students' ability to understand the material in class. Students currently pursuing junior high school are students born in the net generation. According to Dian Wulandari, the net generation is the generation that grew up in the dominance of information technology. This generation was born in 1994 until now. This generation is called the net generation to represent the generation born during the rapid growth of computers and the internet. Therefore it makes it easier to recognize and understand technology. Students can quickly master digital information media, whether they use it for school purposes or others just for entertainment. This makes students more interested in finding learning material through electronic media.

Based on observations and interviews with Mrs. Ade Putri Prasasti, S.Pd., one of the mathematics teachers at SMP Muhammadiyah 1 Prambanan on October 28, 2016, said that the learning process by directly sometimes makes students bored so that an innovative learning media is needed, and also the absence of instructional media used in learning, especially mathematics. This was also expressed by some SMP Muhammadiyah 1 Prambanan students who sometimes felt bored with the process of learning mathematics directly would be happier if there were learning media because

mathematics was considered abstract. Students' interest in mathematics was significantly less apart from that. Their activeness in using the internet was very height which influences the lack of intensity of their learning, especially mathematics.

In the second observation and interview with Mr. Sukirdi S.Pd., one of the mathematics teachers at SMP Muhammadiyah 17 Prambanan hool on October 28, 2016, the teacher found a similar problem the Corresponding learning method which during the group discussion took place. There was a tendency for the topic of problems to occur. It is being discussed extensively. Many are not by the allotted time. Students' interest in learning mathematics is still low, and mathematics is still considered problematic. Besides that, the use of computer laboratories has not been used to the full. From the results of observations and interviews with teachers and students in both schools revealed for class VII material that is considered difficult to understand and illustrate is flat build material such as triangles in the illustration and understanding of the concept of angles,

Based on the description above, it can be concluded that it is very much needed innovative mathematics learning media. Researchers are interested in researching the Development of E-Learning Based Mathematics Learning Media Using Moodle on Triangle Materials for Middle School Students Class VII.

Based on the background described above, the problems to be resolved are: 1) How is the Development of E-Learning Based Mathematics Learning Media using Moodle on Triangle Materials for Grade VII Middle School Students? 2) Is the Development of E-Learning Based Mathematics Learning Media using Moodle on the Triangle Material for Class VII Middle School Students to be used as learning media?

Based on the above problem formulation, research objectives can be formulated as follows: 1) Designing and making E-Learning Based Mathematics Learning Media using Moodle on Triangle Materials for SMP Muhammadiyah 1 Prambanan Students and SMP Muhammadiyah 17 Prambanan. 2) Describe E-Learning Based Mathematics Learning Media's appropriateness using Moodle on Triangle Materials for Students of SMP Muhammadiyah 1 Prambanan and SMP Muhammadiyah 17 Prambanan as learning media at the school.

METHODS

The research method used in this learning media development research is research and development (R&D) using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) based on simplicity so that it can easily design and develop products (Personal, Benny, 2014: 30). In this research, the produced product is a Moodle-based online e-learning website on the Triangle subject.

The following is an explanation of the ADDIE development model and design stages:

1. Analysis. The first step in formulating general goals or competencies is needed to obtain relevant results. The analysis phase requires a needs assessment process carried out at school. The needs assessment process is carried out to collect data and information related to the learning media that will be developed. Analysis in instructional media design analyzes learning media needs, material analysis, and curriculum analysis.

2. Design. The second stage after collecting data and information. The design phase is carried out by intensifying the objectives or general competencies that have been analyzed. According to Benny A. Pribadi (2014: 25), the design phase's result is the blue point in the form of an Outline of the Training Program (GBPP). In this case, the researcher concludes that the blue point is the same as the design process carried out by making a media travel plot or storyboard as a reference in making the learning media.

3. Development. The third step in implementing the ADDIE learning system design model. In the development step, according to Benny A. Pribadi (2014: 26) that training materials or training materials are produced or adapted so that it can be used in conveying the contents or materials of the training program to participants.

In this stage, the conceptual framework is developed by being realized into a learning media product that is feasible to be implemented by the methods to be delivered and the learning objectives.

4. Implementation. The fourth step of the ADDIE learning system design model. According to Benny A. Pribadi (2014: 26), the implementation step is carried out by training programs by designs that have been developed previously. In other words, it means the delivery of learning material from the teacher or instructor to students using instructional media that has been prepared and validated by experts. Then students who took part in the implementation filled out a questionnaire in response to learning media.

5. Evaluation. The final or fifth step of the ADDIE learning system design model is evaluation. Evaluation can be defined as a process carried out to determine the value, price, and benefits of an object (Benny A. Pribadi, 2014: 28). In this case, the object being assessed is a developed learning media product. It aims to determine the feasibility of learning media developed in the learning process. Evaluation of learning media conducted in this study is based on a media expert questionnaire, material experts, and student responses.

The subjects in this research and development consisted of material experts, media experts, and VII graders of SMP Muhammadiyah 1 and SMP Muhammadiyah 17 Prambanan. This study uses data collection techniques, namely: interviews, questionnaires, and observation. The data obtained using the data collection instruments are as follows: the material expert feasibility test questionnaire, the media expert eligibility questionnaire test, and the test questionnaire for student responses.

After the data is collected, according to Sukarjo (2006: 55), from the data collected then the average is calculated using the formula:

$$\bar{X} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Information:

$\bar{X}$: Average score

$\sum_{i=1}^{n} x_i$: Total score

n: Number of evaluators

Furthermore, after all, data have been converted into qualitative using the ideal assessment criteria guideline table 1 with the following provisions:

Table 1. Criteria for Ideal Rating Categories

No	Score	Criteria
1.	$\bar{X} > (X_i + 1,80 \, SB_i)$	Very good
2.	$(X_i + 0,60 \, SB_i) < \bar{X} \leq (X_i + 1,80 \, SB_i)$	Well
3.	$(X_i - 0,60 \, SB_i) < \bar{X} \leq (X_i + 0,60 \, SB_i)$	Enough
4.	$(X_i - 1,80 \, SB_i) < \bar{X} \leq (X_i - 0,60 \, SB_i)$	Less
5.	$\bar{X} \leq (X_i - 1,80 \, SB_i)$	Very less

(Sukarjo, 2006:53)

RESULTS AND DISCUSSION

Following are the stages of the ADDIE development model carried out in this development research:

1. Analysis. The first stage in formulating general goals or competencies is needed to obtain a reference in instructional media development. Therefore researchers analyzed to provide an overview of the learning media to be developed. The analysis carried out is as follows:

   a. The analysis of learning media needs is carried out by interviewing mathematics teachers and observing school conditions, such as the computer laboratory at SMP 1 Muhammadiyah Prambanan and SMP Muhammadiyah 17 Prambanan Klaten. This aims to find out the problems in the learning process.

   b. After analyzing the learning media needs, the next step is to choose the material to be developed in the learning media. The selection of this material was carried out by consultation

and interview with mathematics teachers of SMP 1 Muhammadiyah Prambanan and SMP Muhammadiyah 17 Prambanan Klaten. Triangular material is allowed to be chosen by researchers because it is considered difficult to understand and illustrate.

   c. Curriculum analysis is done by studying learning material, Competency Standards (CS), Basic Competence (BC), and learning objectives to be achieved using learning media.

2. Design. This stage consists of 2 steps: making a learning media design and compiling a media assessment instrument.

   a. Creating Learning Media Designs. This process begins with preparing the flow of making learning media developed in the form of a flowchart.

   b. Develop a Learning Media Assessment Instrument. This study's learning media assessment instrument consisted of a material expert assessment questionnaire, a media expert questionnaire, and a student response assessment questionnaire. Before the questionnaire was used first, it was validated by the validator.

3. Development. The stage where the design of instructional media is translated into actual appearance. The stages are as follows.

   a. Reference Collection. Reference studies are carried out to be used to prepare learning media material that will be developed. In this case, the researchers used two mathematical books used for reference.

   b. Making Learning Media. Media designs that have been made are developed into learning media based on E-learning using Moodle on Triangle material for seventh-grade junior high school students. To develop this learning media, researchers used Moodle as the basis for developing these mathematics learning media with application support programs, including Corel Draw X5 and Macromedia Flash 8.

   c. Learning Media Validation. Validation is intended to request consideration from experts, namely material experts and media experts, to develop the learning media.

   d. Small Class Trial. A small class trial was conducted in a class containing ten students of class VII in SMP 1 Muhammadiyah Prambanan and ten students in grade VII in SMP Muhammadiyah 17 Prambanan Klaten. The implementation of small class trials for SMP Muhammadiyah 1 Prambanan was conducted on October 25, 2017. SMP Muhammadiyah 17 Prambanan Klaten was conducted on October 26, 2017. The selection of these small class pilot students was carried out randomly by the researcher. There is no input from students regarding the learning media developed at this stage so that the next stage can be done.

4. Implementation. After the development phase of the learning, media is completed. The learning media application is applied to the actual classroom conditions, namely all students of class VII in SMP 1 Muhammadiyah Prambanan and VII in SMP Muhammadiyah 17 Prambanan Klaten, which are used as a broad class trial application. Large class trials are the final trials in this development process. This large class trial was attended by all eighth-grade students of SMP 1 Muhammadiyah Prambanan on October 28, 2017, and SMP Muhammadiyah 17 Prambanan Klaten conducted on October 30, 2017. In the large class trial, researchers presented learning media in a computer laboratory. Students observed and operated The learning media for SMP 1 Muhammadiyah Prambanan. For SMP Muhammadiyah 17, Prambanan Klaten was only conducted in the classroom by watching researchers explain their projector's products. After students have finished observing and operating the learning media, the researchers then distributed questionnaires to students to determine the students' responses to the learning media developed. There was no revision in this stage because the learning media were considered good in terms of the material and media appearance.

5. Evaluation. The final step in the ADDIE learning system design model is evaluation. Evaluation can be defined as a process carried out to determine the value, price, and benefits of an object (Benny A. Pribadi, 2014: 28). Evaluation of learning media conducted in this study is based on

questionnaires from media experts, material experts, and student responses. The assessment will be used as a reference to determine the feasibility of the developed learning media.

The feasibility of the learning material is assessed by the three material experts, with the results of the feasibility questionnaire calculation can be seen in the following tabl 2.

Table 2. Results of the Calculation Questionnaire for Material Feasibility

No	Evaluator	Score	Quantitative Category
1.	Harina Fitriyani, M.Pd.	74	Good
2.	Ade Putri Prasasti, S.Pd.	69	Good
3.	Sukirdi, S.Pd.	80	Very good
	Average	74.3333	Good

Based on the table above, these results indicate that the media developed in terms of material received an assessment of 74.33333 to be included in the excellent category.

The feasibility of instructional media was assessed by three media experts, with the results of the feasibility questionnaire calculation can be seen in the following table 3.

Table 3. Results of the Calculation of the Media Feasibility Questionnaire

No	Evaluator	Score	Quantitative Category
1.	Syariful Fahmi, M.Pd.	116	Very good
2.	Ade Putri Prasasti, S.Pd.	113	Very good
3.	Sukirdi, S.Pd.	111	Very good
	Average	113.33	Very good

These results indicate that the developed media in terms of multimedia display received 113.33, so it is included in the excellent category.

Student responses to the learning media developed are known based on the questionnaire's results and filled out by students during small class trials and large class trials. Here are the results of a small class trial:

Table 4. Results of Calculation of Student Response Questionnaire in Small Class Trials

No	Evaluator	Score	Quantitative Category
1.	SMP Muhammadiyah 1 Prambanan	82.3	Good
2.	SMP Muhammadiyah 17 Prabanan	84.5	Very good
	Average	83.4	Good

The above table 4 shows that the average score of the assessment results for small class trials is 83.4. Based on the guidelines table assessment criteria, media assessment of student responses included in the Good category. The following are the results of the product trial:

Table 5. Results of Questionnaire Calculation of Student Responses on Product Trials

No	Evaluator	Score	Quantitative Category
1.	SMP Muhammadiyah 1 Prambanan	80.483	Good
2.	SMP Muhammadiyah 17 Prambanan	84.891	Very good
	Average	82.687	Good

The table 5 above shows that the average score of the assessment results for the product trial is 82,687. Based on the guidelines table assessment criteria, media assessment of student responses is included in the Good category.

Revising the learning media developed in the design and development process is an important step in designing and developing a learning media. The revision process is done before learning media is used on students.

After mathematics learning, media products have been revised twice after getting input from material experts and media experts. After the revision, a small class trial and a large class trial are conducted to determine the students' responses to the learning media. The learning media produced consisted of 5 submersions, namely triangles and their types, the basics of painting, special triangles, large angles of triangles, and the circumference and area of triangles. Also, conclusions from the triangle material in the learning media have been studied and evaluated.

CONCLUSION

The conclusions obtained from the research development of E-Learning based mathematics learning media using Moodle on the triangle material for seventh-grade junior high school students are:

1. Develop a medium for learning mathematics with the ADDIE development model. The explanation is as follows:
    a. Analyst. The analysis is to formulate general objectives or competencies. This is needed to obtain a reference in the development of instructional media. Therefore researchers analyzed to provide an overview of the learning media to be developed. The analysis carried out is as follows:
        1) Analysis of Learning Media Needs. From interviews obtained during observation, it can be concluded that SMP 1 Muhammadiyah Prambanan and SMP Muhammadiyah 17 Prambanan Klaten are possible to apply educational technology in the learning process.
        2) Material Analysis. The material chosen is a triangle because it is considered difficult to understand and illustrate.
        3) Curriculum Analysis. Curriculum analysis is done by studying Competency Standards (CS), Basic Competencies (BC), learning objectives, and learning material that will be achieved in learning using instructional media.
    b. Design. Design is an overall picture, structure, framework, and sequence or systematic activity.
    c. Development. The development stage is the stage where the instructional media design is translated into actual appearance. This stage also validated learning media and testing of learning media products to determine learning media's feasibility. The learning media developed can be used in the learning process.
    d. Implementation. The application phase is the stage where the learning media is applied to the actual classroom conditions.
    e. Evaluation. Evaluation is a process carried out to provide an assessment of the learning media developed.
2. Mathematics learning media based on E-Learning using Moodle on triangle material for seventh-grade junior high school students are declared feasible based on the assessment of media experts, material experts, and students. The assessment that was carried out produced the media with the category of Very Good (SB), with a score of 270,706 from an ideal maximum score of 315.

Based on these results, it can be concluded that learning media based on e-learning using Moodle that was developed is suitable for use in the process of learning mathematics.

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