DEVELOPMENT OF E-MODUL BASED ON HIGH ORDER THINKING SKILL PROBLEM WITH STUDENTS TEAM ACHIEVEMENT DIVISION OF LEARNING MODEL IN ALGEBRA

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ABSTRACT

The lack of media and learning facilities, and the lack of Higher Order Thinking Skills (HOTS) questions, makes learning less exciting and monotonous. This study aims to develop e-modules based on HOTS questions with Student Team Achievement Division (STAD) learning models and determine the quality of e-modules developed. This study refers to the ADDIE model with Analyze, Design, Development, Implementation, and Evaluation stages. This study's subjects were teachers and 7th-grade students of Junior High School (SMP) Muhammadiyah Ngemplak and SMP Negeri 2 Ngemplak. This study's object is an e-module based on HOTS questions with STAD learning models on algebraic form material. Data collection techniques using a questionnaire assessment by material experts, media experts, and students. Data analysis techniques in the form of qualitative descriptive analysis and quantitative descriptive. The results showed that material experts in the aspects of conformity, completeness, convenience, and clarity received values of 86%, 80%, 87%, and 88%, respectively. The media experts in effectiveness, ease, suitability, completeness, and communicative and interactive scores were 93%, 93%, 92%, 90%, and 92%. The average results of student responses from the two schools on convenience, clarity, suitability, appearance, attractiveness are 90%, 90%, 90%, 94%, and 92%. So it can be concluded that the e-module produced is classified both in terms of material, very good in terms of media, and very practical in its use.
Keywords: e-module, HOTS, STAD, Algebraic

INTRODUCTION

Mathematics is the study of computation and everything that can be logical and abstract (Jaeng in Ruliyanda, 2015: 44). Mathematics is always taught at all levels of education, from elementary to tertiary. Mathematics can not be separated from human life, both from the age of children to adults. However, most of the students think that mathematics is a difficult and scary subject. However, mathematics is essential for students to learn to the next level (Syahrir: 2015).

The teaching and learning sequence moves from passive student mode to active and more structured student mode (Majoka, 2010: 16). Active learning is a method of educating students who demand active participation in the learning process, such as finding their solutions to learning material (Majoka 2010: 16). One way to make active learning is to use the STAD learning model. The STAD learning model has several advantages, namely: 1) Each group member gets an assignment, 2) There is a direct interaction between students in the group, 3) Training students to develop social skills, 4) Getting students to respect the opinions of others, 5) Improving students' ability to speak and act so that their academic abilities improve 6) Give opportunities to students to dare to ask questions and express opinions, 7) Facilitate the realization of a sense of brotherhood and solidarity, 8) The implementation of student-centered learning, so that students almost entirely use the available time for learning activities, 9) Give opportunities for the emergence of positive attitudes of students.

STAD is one method in cooperative learning or group learning that is easy to practice because it is a simple and effective learning method. Slavin and his friends developed STAD-type cooperative learning at Jhon Hopkin University. Slavin (2011: 21) in Kristin's (2016: 77) Student Teams Achievement Division (STAD), students are placed into learning teams consisting of four people who mix levels of performance, gender, and ethnicity. The teacher presents the lessons, then students work in small groups and make sure all members understand the lessons given. STAD (Student Team Achievement Division)

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Learning media are a means or intermediary to channel messages and learning information from teacher to student. The better the learning media is designed to help students achieve learning goals. Because each type of learning media has characteristics, strengths, and weaknesses, it is necessary to do systematic planning for instructional media use (Nurseto in Ramdhani: 2015). Learning media is useful in the teaching and learning process because it can attract more students' attention so that learning becomes active and learning objectives can be adequately achieved. The benefits of learning media for teachers are that teachers do not need to spend much energy to teach anymore; teaching and learning time is more effective and efficient. E-module is an ICT-based module (Information and Communication Technology) that has advantages compared to printed objects such as its interactive nature, which facilitates navigation, can display / load images, audio, video, and animation, and can be supplemented with formative tests/quizzes that enable automatic feedback reverse immediately (Widiana: 2016).

The results of observations at SMP Muhammadiyah Ngemplak and SMP Negeri 2 Ngemplak are teachers who have not applied active learning, and students have not used the HOTS questions. Students also feel bored with the way of learning centered on the teacher.

METHODS

This research uses the ADDIE research method, which has five stages: analysis, design, development, implementation, and evaluation (Tegeh, Jampel, and Pudjawan, 2014: 42). This study's subjects were teachers and 7th-grade students of SMP Muhammadiyah Ngemplak and SMP N 2 Ngemplak. This study's object is an e-module based on HOTS questions with STAD learning models on algebraic form material.

RESULT AND DISCUSSION

This development is the e-module developed with the ADDIE development model and is already of good quality and practicality. There is a validation process at the Development stage to assess the quality of the product being developed. The validation process is carried out by two validators, namely the media expert validator and the material expert validator. The results of the validation of the two validators can be seen in the following Table 1.

Table 1. Results of E-Module Validation Data Analysis for Every Aspect by subject matter experts

No	Aspects	Average Score	Clarification	Explanation
1	Conformity	86%	Good	Slight revision
2	Completeness	80%	Good	Slight revision
3	Convenience	87%	Good	Slight revision
4	Clarity	88%	Good	Slight revision
Average Score		85%	Good	Slight revision

Table 1 shows that 86% in conformity aspects with good clarification, 80% incompleteness with good clarification, 87% inconvenience aspects with good clarification, and 88% clarity with good clarification. From the above data, the average score of all aspects is 85%. Thus, it can be concluded that the e-modules developed are of good quality in terms of material.

Table 2. Results of E-Module Validation Data Analysis Results for Every Aspect by subject media experts

No	Aspects	Average Score	Clarification	Explanation
1	Effectiveness	93%	Very Good	No Revision Needed
2	Convenience	93%	Very Good	No Revision Needed
3	Conformity	92%	Very Good	No Revision Needed
4	Vulnerability	90%	Very Good	No Revision Needed
5	Communication and Interactive	88%	Good	Slight Revision
Average Score		91%	Very Good	No Revision Needed

In table 2, it can be seen that 93% in the effectiveness aspect with very good clarification, 93% in the aspect of convenience with very good clarification, 92% in the aspect of conformity with very good clarification, 90% in the aspect of vulnerability with very good clarification, and 88% on communicative and interactive aspects with a good clarification. From the above data, the average score of all aspects is 91%. Thus, it can be concluded that the e-modules developed are of good quality in terms of media.

After the validation process, the product developed is then tested at the school to be tested for practicality. In this case, two schools are the subject of research, namely SMP Muhammadiyah Ngemplak and SMP Negeri 2 Ngemplak. For results of practicality analysis of products can be seen in the following table 3:

Table 3. Results of Practical Analysis of E-Modules for Every Aspect of Merging the Two Schools

No	Aspects	SMP Muhammadiyah Ngemplak	SMP Negeri 2 Ngemplak	Average Score	Clarification
1	Convenience	91%	82%	86%	Good
2	Clarity	83%	84%	84%	Good
3	Conformity	83%	82%	83%	Good
4	Appearance	91%	90%	90%	Very Good
5	Attractiveness	91%	91%	91%	Very Good
Average Score		88%	86%	87%	Good

In table 3, it can be seen that the results of practicality analysis at SMP Muhammadiyah Ngemplak by 91% in the aspect of convenience with good clarification, 83% in the aspect of clarity with good clarification, 83% in the aspect of conformity with good clarification, and 91% in the aspect of appearance with very clarification good, and 91% on aspects of attractiveness with a very good clarification. From the above data, the average score of all aspects is 88%. While the practicality analysis results at SMP N Ngemplak were 82% in the aspect of convenience with good clarification, 84% in the aspect of clarity with good clarification, 82% in the aspect of conformity with good clarification, and 90% in the aspect of the display with very good clarification, and 91% on the attractiveness aspect with a very good clarification. From the above data, the average score of all aspects is 86%. When combined, the results of the analysis of the two schools will get 86% in the aspect of convenience with good clarification, 84% in the aspect of clarity with good clarification, 83% in the aspect of conformity with good clarification, and 90% in the aspect of the display with excellent clarification, and 91% on aspects of attractiveness with a very good clarification. From these data, the average score of all aspects was 87%. Thus, it can be concluded that the e-modules developed are of good quality in terms of material.

CONCLUSION

Based on the research objectives and problem formulation, the conclusions of this study are divided into two, namely:

1. The HOTS question-based e-module with the STAD learning model was developed by referring to the ADDIE model (Analysis, Design, Development, Implementation, and Evaluate).
2. This learning media is valid and feasible to be tested based on validation by material experts and media experts who get results, namely the 86% conformity aspect with good classification, the completeness aspect is 80% with good classification, the convenience aspect is 87% with good classification, and in the aspect of clarity of 88% with good classification. The average score of questionnaire responses of students from two schools, namely SMP Muhammadiyah Ngemplak and SMP N 2 Ngemplak namely from the aspect of convenience by 90% with very good classification, on the clarity aspect by 90% with very good classification, on the aspect of suitability by 90% with classification very good, the display aspect was 94% with very good classification. The attractiveness aspect was 92% with very good classification.

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