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DEVELOPMENT OF IT-BASED MATHEMATICS LEARNING MEDIA USING ARTICULATE STORYLINE

Nurul Fadhila[1], Rahmi[1*], Hamdunah[1]
[1]Pendidikan Matematika, Fakultas Sains dan Teknologi, Universitas PGRI Sumatera Barat
*Email : rahmisajani@gmail.com

Abstract

This research is motivated by the lack of motivation and participation of students in participating in learning mathematics. The purpose of this study was to produce a valid and practical IT-based mathematics learning media on Data Presentation material at SMP N 1 Padang Ganting. The type of research used is development research using the ADDIE development model. The research instrument used was a validation questionnaire, a practicality questionnaire that was useful to see the practicality of learning media by teachers and students. The results of the validity of IT-based learning media using Articuate Storylineby 98% with a very valid category. The final value of practicality with the teacher obtained a final score of 100% in the very practical category. The final value of practicality with students was obtained 96.7% in the very practical category. Based on the results of the study, it can be concluded that IT-based learning media using Articuate Storyline is declared valid and practical to use in learning data presentation materials at SMP N 1 Padang Ganting.

Keywords: *IT Based Media, Articulate Storyline, Data Presentation*

INTRODUCTION

Mathematics is a subject that is taught at all levels of education, especially education in Indonesia because mathematics is a subject that is considered important for everyday life and broadens other knowledge such as science and technology (Rukamana et al., 2020, p. .620). Mathematics lessons learned at school are lessons that use clear, critical, creative and also logical thinking tools. This is in line with what was revealed by Rahmi (2021: 2447) that teaching school mathematics is one way to improve human quality because mastery of mathematical thinking will allow one way to develop clear, precise and thorough thoughts. However, the abstract and systematic characteristics of mathematics are one of the reasons students experience difficulties when studying mathematics (Adrian & Apriyanti, 2019: 51). This was also expressed by vera (2019) who said that Mathematics is a subject that is difficult to understand in just one meeting. Because of this, mathematics is still seen as a difficult and unpleasant subject.

Based on the results of observations made at Padang Ganting 1 Public Middle

School on March 15, 2022, information was obtained that the curriculum used was the 2013 curriculum, but the implementation was not optimal because the learning was still one-way, namely teacher centered, meaning that the learning process was very depending on the teacher's instructions, so that the concentration of students in learning only focuses on the teacher, they only listen and take notes. The teacher decides the learning objectives and topics. The teacher also measures the level of student development by providing questions for students to answer. This is in line with Maulani's opinion (2021) that teacher-centered learning causes students to become dependent on teachers in the learning process, and also causes students to be less active in the teaching and learning process.

One of the materials in class VII mathematics subject is data presentation material. In class VII students are taught how to present data such as tables, line charts, bar charts and pie charts. This is in line with research conducted by Maryati (2017) that students experience some difficulties, one of which is that students have difficulty recognizing and classifying data types and displaying them in the form of tables or diagrams.

Addressing this problem requires learning innovations that can make students understand the material in mathematics. Mathematics learning becomes effective if the teacher can present learning according to the wishes and learning needs of students so that students can be actively involved and motivated in learning it (Purwaaktari, 2015). One of them is by using learning media.

Media comes from Latin, namely medio, in Latin, media is interpreted as an intermediary. Media is the plural form of medium which literally means intermediary or introduction (Salsabila & Safira, 2021). Media is one of the factors that influence the success of the learning process in schools because it can facilitate the process of conveying information both from teachers to students and vice versa (Khairani, 2016: 96). The use of learning media in the learning process at school can attract students' attention to pay more attention to the explanations given by the teacher, so that it can foster student interest and willingness to learn (Priyonggo, 2016: 199). This is in line with what Eti (2015) revealed that media is an important thing in the learning process. Media can not only attract students' attention but can also make students understand more about the material presented. In order for learning to become innovative learning, a teacher must have various skills including skills in choosing learning models and skills in choosing or making appropriate learning media (Hasan & Rica Wijayanti, 2018: 44).

The media can increase and direct students' attention so that it can generate motivation to learn, more direct interaction between students and their environment and students will more easily understand the subject matter provided (Hikmah & Maskar, 2020: 16). The use of creative media can facilitate and improve the efficiency of learning so that learning objectives can be achieved (Surya & Puspita, 2017). According to Suryani (2015: 3) IT-based learning media is able to support and facilitate the teaching and learning process as well as the delivery and presentation of material will be more interesting and fun so as to generate student interest and provide many benefits in education. One of the IT-based media that is able to increase and direct students' attention is IT-based media using the articulate storyline (Purnama & Asto B, 2014: 276).

Articulate storyline is software that functions as a medium of communication or presentation. Learning media using articulate storyline software is no less interesting than other interactive media such as Macromedia Flash, Adobe Flash and so on. By using articulate storyline , learning becomes fun and easy to understand, and abstract material can be illustrated with various animations in the articulate storyline (Purnama & Asto B, 2014). Articulate Storyline is a tool that can be used to structure presentations. Holding the same position as Microsoft Power Point, Articulate Storyline has several advantages that can make presentations more creative and interesting (Saputri, D., & Bentri, A. 2017). Interactive media in the form of software*Articulate Storyline* also provides templates that can be used for interactive media, especially for making test and practice questions. In addition, the program also makes it easier for users to publish online and offline so that it can be formatted on CDs, word processing, personal pages and LMS Ghozali in (Suhailah et al., 2021). Therefore, the researchers developed IT-based learning media using the articulate storyline in mathematics on data presentation material.

Based on the description above, a development study was carried out entitled "Development of IT-Based Mathematical Learning Media in Class VII Data Presentation Materials at SMP Negeri 1 Padang Ganting".

RESEARCH METHOD

This type of research is research and development (research and development/R&D) which will produce products in the form of IT-based learning media using Articulate Storyline. The research and development method is a research method that aims to produce

and test certain products (Sugiyono, 2015: 28). The development model used in this study is the ADDIE model which has 5 main stages, namely Anaysis (analysis), Design (design), Development (development), Implementation (implementation), and Evaluation (evaluation). The procedure for product development with the ADDIE model can be seen in Figure 1.

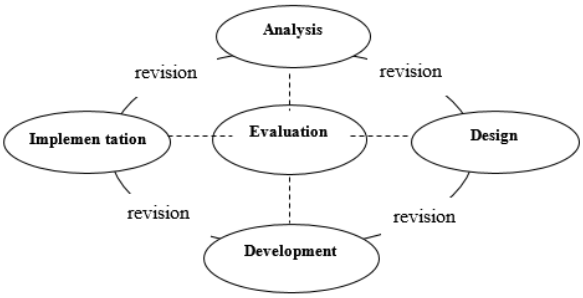


Figure 1
The ADDIE approach for developing products in the form of learning designs (Sugiyono, 2015: 39)

The following are the steps for the ADDIE model development procedure according to Sugiyono (2015: 38), namely: (1). Analysis, The analysis phase is a stage of gathering information that can be used as material for making products. At this stage what is done is to collect information in the form of problems or obstacles that occur during the learning process. (2) Design, In this stage, the learning media planning stage is carried out, namely making media designs and detailed process requirements. Activities carried out at this stage such as making a storyboard. (3) Development, the development of IT-based learning media using Articulate Storyline is made based on the design previously described. After that, validate the learning media. (4) Implementation. At this stage, implementing learning media, after the media is declared valid by the validator, a small group evaluation is carried out involving one teacher and six students. (5) Evaluation at this stage an evaluation of the learning media that has been implemented is carried out. If there are still deficiencies, a revision is made again.

The research subjects for the development of IT-based learning media in data presentation material were class VII.A students of State Middle Schools 1 Changing Field. Data collection methods used are questionnaires and interviews. This data collection method uses an instrument in the form of a questionnaire. Questionnaires were used to collect the

results of reviews by media experts, material experts, one-on-one evaluations and small group tests.

RESEARCH RESULTS AND DISCUSSION

Research

Results The results of this study are IT-based learning media products using Articulate Storyline in material for presenting valid and practical data. The stage carried out in the development of learning media products is using the ADDIE development model. The following are the steps in developing instructional media:

First is the analysis phase, at this stage a needs analysis, textbook analysis, syllabus analysis, and student characteristics analysis are carried out. Based on the results of the needs analysis, it is known that in the data presentation material, learning is in accordance with the KI and KD in the 2013 curriculum. The data presentation material has described the material systematically, with the completeness of the material, the suitability of the material that has been discussed sequentially, the suitability of the material with student characteristics. However, to increase students' ability to understand the material being taught, it is necessary to develop learning media as a learning companion in addition to the textbooks that have been used. When conducting observations and interviews with teachers and students, it was found that students felt less interested and had difficulty understanding the material in learning mathematics. Because learning mathematics seems monotonous, boring and less interesting. Teachers are required to be able to develop interesting and not boring IT-based learning media.

The second is the design stage, at the design stage the researcher seeks information that is used as a source for making learning media. The design of IT-based learning media is by making storyboard that is useful as a reference for making design the actualThe storyboard that is made includes several menus, namely the media usage guide menu, Basic Competency menu, Material menu, and quizzes related to Data Presentation material. The following is the design of IT-based learning media using Articulate Storyline:

Figure 2 Preliminary Design of Learning Media

The third is the Development, at this stage the media begins to be made based on the manufacturing design that has been carried out at the design stage. At this stage many processes are carried out starting from adding images, animations, added sound, to voice

recording for learning media. The tool for developing this learning media is Articulate Storyline which is a software for creating interactive learning media. After the stage of making learning media is complete, the product is discussed with the supervisor to get criticism, suggestions and improvements to the media. Furthermore, the media was revised according to the advice of the supervisor. After obtaining approval from the supervising lecturer to validate the media, the media is then validated by media experts and material experts. The following are the results of validation by the media:

Table 1. Learning Media Validation Results

No	Indicator	Validator		Final Value	Category
		Media	Material		
1	Aspect of Eligibility Content	-	95%	95%	Very Valid
2	Aspect of Eligibility presentation	-	93%	93%	Very Valid
3	Aspect of Eligibility Language	100%	100%	100 %	Very Valid
4	Aspect of Díplay	100%	-	100 %	Very Valid
5	ease of use aspect	100%	-	100 %	Very Valid
Finsl Value Validation		100%	96%	98%	Very Valid

In Table 1 it can be concluded that the final value of the validation of IT-based learning media using Articulate Storyline obtained a value of 98% with a very practical category. This shows that the learning media developed is attractive from a media standpoint and is feasible from a material standpoint. Next is the implementation. After several development stages are carried out, the next step is to test the practicality of IT-based learning media using Articulate Storyline. learning media was tested on math teachers and 6 students. The students who were tested had heterogeneous abilities, namely 2 students with low abilities, 2 students with moderate abilities and 2 students with high abilities. Test results the practicality of IT-based learning media using Articulate Storyline is carried out one-on-one evaluation and small group trials.

In the one-on-one evaluation of IT-based learning media using Articulate storylines that have been validated and declared valid by the validator, then proceed with the next stage,

namely one-on-one evaluation which aims to test the practicality of the developed learning media. One-on-one evaluation was carried out for math teachers at SMP N 1 Padang Ganting by providing IT-based learning media using Articulate Storyline to math teachers and giving directions and instructions for using the media. After the teacher uses IT-based learning media using Articulate Storyline , then the teacher will be given a practicality questionnaire to provide an assessment of whether the media is practical or not to be used as teaching material for students in learning. The following are the results of Practicality by mathematics subject teachers:

Table 2 Results of practicality by teachers

No	Indicator	Final Value	Category
1	Ease of use aspect	100%	Very Practical
2	Aspect ò learning time efficiency	100%	Very Practical
3	Aspect of benefits obtained	100%	Very Practical
	Final Value Practicality	100%	Very Practical

Based on table 2 it can be seen that the practicality of IT-based learning media using Articulate storylines by the teacher obtained a final score of 100% in the very practical category and is worth testing its practicality on students. The results of practicality show that IT-based learning media using Articulate storylines is practical for teachers to use as one of the mathematics learning media in the matter of presenting data.

Then carry out a small group trial, aiming to see the practicality of students in using IT-based learning media using Articulate Storyline in Data Presentation material. The steps taken at this practicality stage were to ask the mathematics teacher for a list of names of students who had high, medium, and low learning abilities. Data were taken as many as 6 students who were considered to represent class VIIA. The students consisted of 2 high-ability students, 2 medium-ability students, and 2 low-ability students.

The next step is the researcher explains how to use IT-based learning media using Articulate Storyline to 6 randomly selected students. After that the researcher directs and guides students to understand the material, examples of questions and asks students to work on quizzes in the media. The next step is to direct students to fill out practical questionnaires that are useful for testing the practicality of learning media for students.

The data from the practicality questionnaire results that have been filled in by students are analyzed and processed. Assessment of the practicality questionnaire is seen from the aspect of ease of use, efficiency of learning time and the benefits obtained. After that, the next step is for students to fill out a questionnaire that has been prepared. The following are the results of practicality carried out on students:

Table 3 Results of Practicality by Students

No	Indicator	Final Value	Category
1	Ease of use aspect	97%	Very Practical
2	Aspect ò learning time efficiency	97%	Very Practical
3	Aspect of benefits obtained	99%	Very Practical
	Nilai Akhir praktikalitas	97,3%	Very Practical

The table shows that the practical results of IT-based learning media using Articulate Storyline by students obtained a final score of 97.3% in the very practical category. Based on the results of the practical questionnaire, teachers and students obtained an average practicality score of 98.6% in the very practical category. Results of the practicality of IT-based learning media using Articulate Storyline on practical data presentation material for use in learning mathematics at SMPN 1 Padang Ganting

Discussion

At the validation stage of IT-based learning media using Articulate storylines, the validator provides suggestions for improving the learning media that has been designed. Here are some suggestions provided by the validator:

Feasibility of content

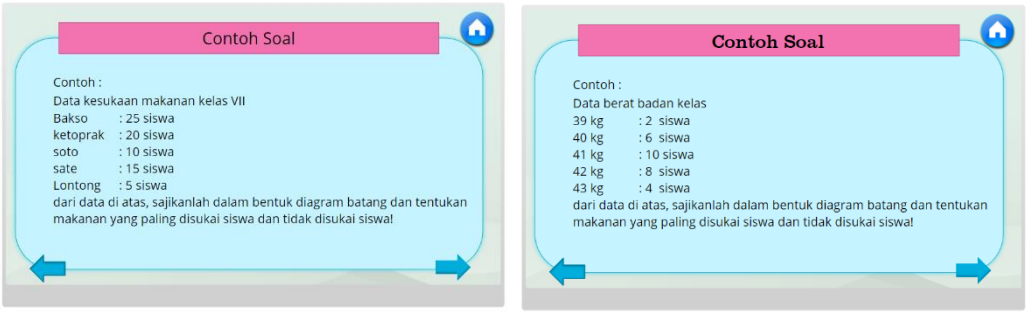
In the material section on how to collect data, the validator suggests adding examples for each method of collecting data. Display of learning media before and after revision Seen in the picture:

Before Revision After Revision

Figure 3 Display of material before and after revision

Feasibility of Presentation

In the sample questions section the validator suggests changing the questions to the bar chart examples. Display of learning media before and after revision Seen in the picture:



Before Revision After Revision

Figure 4 Display of sample questions before and after revision

Display

In the material menu section, the validator suggests adding a special button to go to the material. Display of learning media before and after revision Seen in the picture:

Before Revision After Revision

Figure 5 Display of the material menu before and after revision

Ease of use

In the material section, the validator suggests adding a back button to go to the material menu. The validator also suggests adding submit quizzes to the display of instructions for using the media. Display of learning media before and after revision Seen in the picture:

Before Revision After Revision

Figure 6 Display of material before and after revision

Before Revision After Revision

Figure 7 Display of instructions before and after revision

Based on the results of validation by a team of experts and design experts, it was found that IT-based learning media using Articulate Storyline in data presentation material is feasible to use with revision. IT-based learning media uses Articulate Storyline that has been validated and declared valid by the validator, then proceed with the next stage, namely the practicality stage which aims to test the practicality of IT-based learning media. The practicality aspect of learning media can be seen from the practicality questionnaire of learning media given by the teacher during individual trials to the mathematics teacher of SMP N 1 Padang Ganting, namely Mrs. Astina Yanti, M.Pd and the practical questionnaire by students given during small group trials. Assessment of the practicality questionnaire by the teacher is assessed from several aspects, including aspects of ease of use, efficiency of learning time and the benefits obtained. Based on the results of a media practicality questionnaire learning by the teacher, obtained a percentage of the results of the practicality assessment of IT-based learning media of 100% in the very practical category.

Furthermore, the assessment from the questionnaire on the practicality of learning media by students is assessed based on several aspects, including aspects of ease of use, efficiency of learning time and the benefits obtained. During the small group trials, students gave good and positive responses, especially when giving an assessment of the learning media provided. Based on the results of a questionnaire on the practicality of learning media by students, the percentage of the results of the practicality assessment of IT-based learning media was 97.3% in the very practical category.

Based on the results of an assessment of the practicality of IT-based learning media using Articulate storylines by teachers and students, an average percentage of the practicality of learning media is 98.6% in the practical category, meaning that the learning media that are designed are said to be practical as learning media for teachers and students. This is in accordance with research conducted by Khusnah (2020) that learning media uses articulate storylines that are valid and practical to use in the learning process.

CONCLUSION

Based on the research and data analysis that has been done, it can be concluded that IT-based learning media in Data Presentation material is very valid with a percentage of 98% with a very valid category obtained from the average final score of the media validator and material validator. The practical results of learning media are very practical with a

percentage of 98.6% in the very practical category obtained from the average practical results of teachers and students. Based on the percentages above, this proves that learning media

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