THE DEVELOPMENT OF ARTICULATE STORYLINE-BASED LEARNING MEDIA ON THE MATERIAL OF BUILDING FLAT SIDE SPACE FOR CLASS VIII

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Article history:		Abstract:
		This study aims to produce learning media based on Articulate Storyline on good and quality and effective flat side space building materials in class VIII of SMP Negeri 1 Botumoito. This research is R&D and the development model used is 4-D (Define, Design, Develop, Dessiminate). The sample in this study was 30 students of class VIII-2 SMP Negeri 1 Botumoito. Data collection techniques used are interviews, questionnaires, and observation. Analysis of the data used is descriptive analysis technique. The results showed that the developed media was feasible to be used as an interactive learning media that could motivate and improve student learning outcomes on the flat-sided building material. This can be seen from the results of the validation by material experts and media experts who received an assessment of 95.8% and 92.9%, respectively, and seen from the results of the learning test there was an increase, initially 15 students got an average score of 64.4 below the minimum completeness criteria of SMP Negeri 1 Botumoito with a less category and 15 other students getting a score of 72.3 above the minimum completeness criteria with a sufficient category, after using articulate storyline-based learning media increased to 8 students getting an average score of 74.38 categories enough, 18 students got an average score of 84.67 in the good category and 4 students got an average score of 94.38 in the Very Good category, while judging by the results of the student response questionnaire, the use of Articulate Storyline-based learning media on the material the flat side of the building reaches more than 85%, namely 90.01% which indicates a very positive response. Thus, it can be concluded that the Articulate Storyline-Based Learning Media in the Class VIII Flat Side Space Building Material can be classified as effective and said to be good and of good quality as an alternative mathematics learning media.

INTRODUCTION

Mathematics is a subject that first comes to mind and is considered difficult by students because of the contradictions in the teaching process. Due to the existence of some clearly abstract mathematical material, learning that emphasizes the delivery of information can hinder the abstraction power of students. In fact, teachers often experience difficulties when teaching mathematics material which should provide a concrete picture of the material presented, resulting in low and uneven quality of the results obtained by students.

Researchers conducted interviews with mathematics teachers at SMP Negeri 1 Botumoito. This study aims to increase awareness of the use of learning resources other than books in the classroom environment. It is true that teachers only use books as the only source of information for teaching, especially in terms of materials for flat-sided building materials which basically require a real picture. more often use conventional techniques in learning which causes a lack of interest and motivation of students in taking part in learning, especially in the material for building flat sides. Even though the facilities and infrastructure that support the use of interactive learning media are adequate, namely the availability of LCD projectors, wifi, and computer equipment. However, with the same consideration, the teacher underlines that by utilizing learning media it will make it easier for students to understand what they are learning. Learning media is a tool that can help students understand what they are learning so that the learning objectives are clearer and more successful (Kustandi and Darmawa, 2020: 6) [1]

Teaching methods and learning media are two important components of every learning process (Kustandi and Sutjipto, 2011:19)[2]. To facilitate correspondence between teachers and students, the use of learning media is one of the valuable tools or intermediaries for working with educational experiences and can create new desires and interests

for students, generate inspiration for learning, and in any case, have a mental impact on students. learners. This is very useful for teachers in teaching and makes it easier for students to get and look for examples. This process requires teachers who can adjust between learning media and learning strategies**.**

During the COVID-19 pandemic, educational experiences at schools are conducted online and offline. This allows the use of learning media for the purpose of communicating messages between students and the material introduced by the teacher and filling in as a support for how students can interpret the material they need to learn, Ambarsari and Hartono (2017) in Puspitasari et al (2018)[3].

In learning mathematics, it is expected that there will be learning media. According to Aini et al (2021)[4] Learning media is very important to inspire students to have the choice to follow the evolving experience. For this situation, educators are also expected to recreate as much as possible the review and extension of important numerical ideas to improve learning materials so that teaching and educational experiences will be very interesting and participants will learn more enthusiastically. Learning using interactive learning media emphasizes individual exercises, where students effectively concentrate on the material, do practice questions, conduct assessments, and repeat if the reactions given are not appropriate.

Articulate Storyline is an interactive multimedia application with content in the form of writing, sound, images, videos, graphics, as well as simulations and animations to create simple and interesting learning media. The results of the publication of Articulate Storyline are in the form of application files (.exe) or web-based media that can be applied to various devices such as smartphones, tablets and laptops. (warstek.com.2021)[5].

According to Arwanda et al (2020)[6] Articulate Storyline learning media is one of the learning media created to combine an illustration. Utilization of Articulate Storyline as a learning medium involves students directly, with the aim that they are successfully involved in learning.

Based on the explanation above, it is necessary to develop interactive learning media that uses Articulate Storyline in the material for building flat side spaces. This improvement can make it easier for students to understand ideas related to the material involved and can help teachers in learning with handling. So the researcher is interested in conducting a study entitled "Development of Articulate Storyline-based mathematics learning media in Class VIII Class Constructed Flat Side Spaces".

METHOD

This type of research is a type of research and development (Research and Development) using a descriptive approach that is oriented to the development of the resulting product. Sugiyono (2016: 297)[7] argues that to produce certain products and test their effectiveness using research methods is called research and development. To develop learning media in this research is the model of Thiagaran, Semmel and Semmel (1974: 5-9)[8] which is known as the Four-D Model (4-D Model). The 4-D model was chosen because it is more organized and logical for making learning media, but in this study it is intended for learning for normal students. This research was conducted at SMP Negeri 1 Botumoito in the even semester of the 2021/2022 academic year. The sample in this study was 30 students of class VIII-2 SMP Negeri 1 Botumoito. Information collection procedures used were interviews, questionnaires, and observations. Analysis of the data used is descriptive analysis technique.

RESULTS AND DISCUSSION
Learning Media Development Results

This research was carried out at SMP Negeri 1 Botumoito in mathematics subjects with flat-sided geometry with a 4-D development model (Four-D Model). This model consists of 4 stages, namely Define, Design, Develop, and Disseminate. The 4D (Four D) model is arranged systematically so that in its implementation sequentially, each stage that will be passed always refers to the previous stage which goes through a revision or improvement process so that the next stage is obtained an effective learning media product.

The Define stage is the stage where the researcher conducts an initial analysis of the problems that arise in learning activities at SMP Negeri 1 Botumoito and the importance of developing interactive learning media to overcome these learning problems. It was found that the limitations of the learning media used by the teacher forced students to always understand the material only from the available textbooks. The lecture method that is still often used causes students to feel bored and not active in the classroom. Teachers should be required to be more creative in learning activities that only meet twice a week. Facilities such as LCD projectors, wifi are available as well as the ability of teachers and students to operate laptops/computers well but still not fully utilized, so that learning activities still seem less varied. The use of media that is rarely used makes students still rely on the available textbooks. The teacher is not the main source of learning, but with his position as the driving force, the teacher must have the ability to design and create other learning resources so as to create a conducive learning environment. (According to Munadi, 2008:5)[9].

Linking instructional messages made in a structured manner by the teacher is referred to as another learning resource which is commonly called learning media. Therefore, researchers develop interactive learning media that are considered capable of presenting interesting and not boring content so that they are able to arouse students' interest in learning in the learning process and learning objectives will be achieved properly. The development of interactive learning media supports the theory put forward by Sadiman (2009: 7) [10] that the media is anything that can be used to communicate messages from the sender to the recipient so that it can strengthen the considerations, feelings, concerns, interests, and considerations of students so that it occurs learning and developing experiences.

Design Phase (Design), researchers develop a design based on the analysis phase that was carried out previously. The preparation of this design is very influential on the overall form of the interactive learning media that will be developed. Researchers make flowcharts as a guide and make it easier to develop interactive learning media using Articulate Storyline. Furthermore, the production of interactive learning media for flat-sided building materials was developed by combining text, images, audio and video. The production process is assisted by several software, including Snipping Tool for image editing, Adobe Audition for audio processing, Canva for background use, and Geogebra for creating simulation videos and Articulate Storyline as software for creating interactive learning media. The development of interactive learning media for flat-sided building materials is produced with content that is tailored to the characteristics of students. Selection and legibility of text types, text colors, image packaging, as well as the addition of audio and video that can attract students' interest to pay attention to learning. The material developed into interactive learning media is adjusted to the basic competencies and indicators of achievement. The first step of production is making the opening and the main page/main menu of interactive learning media. The next step is to create a guide menu and a competency menu, the menu is made so that interactive learning media is more focused and easy to use. The next step is making a competency menu that contains the basic competencies and indicators to be studied, then a material menu by adding images and videos, as well as the required text material. Next is the information menu which contains references and maker info. The last step is to add interactivity in the form of quizzes/games through the menu in the Articulate Storyline software. Interactivity in the form of quizzes/games in this case is an evaluation aimed at inviting students to be more active in learning activities and as an independent simulation material.

The Develop Stage The suitability of interactive learning media developed with the characteristics of multimedia learning is strengthened by the opinions of material experts and media experts. The following are the results of material validation by material experts:

Table 1. Results of Material Validation by Material Experts

	Aspect	Expert 1	Expert 2	Expert 3	Persentase
	Kesesuaian Materi				
1	The material in the articulate storyline-based learning media is presented in accordance with the basic competencies	In accordance	In accordance	In accordance	100%
2	The material in the articulate storyline-based learning media is presented according to the level of knowledge of the students	In accordance	In accordance	In accordance	100%
3	The description of the material in the articulate storyline-based learning media that is presented in accordance with the learning objectives	In accordance	In accordance	In accordance	100%
4	Presentation of material in systematic articulate storyline-based learning media.	In accordance	In accordance	In accordance	100%
5	Presentation of material in articulate storyline-based learning media is accompanied by assignments or evaluations as training material for students.	In accordance	In accordance	In accordance	100%
	Language Compatibility				
6	Sentences used in communicative articulate storyline-based learning media	In accordance	In accordance	In accordance	100%
7	The language used is in accordance with the rules of the Indonesian language.	In accordance	In accordance	Doubtful	66,7%
8	The sentences used do not have a double meaning.	In accordan	In accordanc	In accorda	100%

		ce	e	nce	
Average					**95,8 %**

Based on Table 1, it can be seen that the average assessment or validation results from material experts stated that the average aspect of the suitability of material and language in interactive learning media based on articulate storylines on flat-sided building materials was 95.8%. This means that the assessment results of the three validators for material validation are "valid".

The results of media validation by media experts are as follows:

Table 2. Media Validation Results by Media Experts

Aspect		Expert 1	Expert 2	Persentase
Aspects of Display Design				
1	The display design in the articulate storyline-based learning media is presented attractively	In accordance	Doubtful	100%
2	Images in articulate storyline-based learning media can represent the learning material presented.	In accordance	In accordance	100%
3	The background used in the articulate storyline-based learning media has the right color	In accordance	Doubtful	50%
4	The menu display on the articulate storyline-based learning media makes it easier for users to use the media.	In accordance	In accordance	100%
5	The menu layout on the articulate storyline-based learning media does not confuse users.	In accordance	In accordance	100%
6	The buttons on the articulate storyline-based learning media have the right colors and icons	In accordance	Doubtful	50%
7	The buttons on the media have a reaction precision	In accordance	In accordance	100%
8	Buttons have the right colors and icons	In accordance	In accordance	100%
9	Fonts/letters in the text have the right color	In accordance	In accordance	100%
10	*Font size or font size is appropriate and appropriate for its use (title, content, etc.)*	In accordance	In accordance	100%
11	The type of font used does not confuse the user to understand the information loaded	In accordance	In accordance	100%
Audio Aspect				
12	The narrator's voice is clear, contains no noise.	In accordance	In accordance	100%
13	The audio effects used are appropriate and attractive, and not distracting.	Doubtful	In accordance	In accordance
14	Media has a balanced mix of background sound.	In accordance	In accordance	100%
Video Aspect		In accordance	In accordance	100%
15	The video illustration is delivered in accordance with the learning material.	In accordan	In accorda	100%

		ce	nce	
16	Video resolution presented in high-quality learning media	In accordance	In accordance	100%
	Animation Aspect			
17	Presentation of opening animation and content on appropriate media	In accordance	In accordance	100%
18	The animation presented is not excessive	In accordance	In accordance	100%
19	Animation supports the content of the material presented	In accordance	In accordance	100%
	Aspects of Ease of Use of Media			
20	The media is easy to use and simple in operation	In accordance	In accordance	100%
21	Media can be used on various devices	In accordance	In accordance	100%
	Average			**92,9%**

Based on Table 2, it can be seen that the average assessment or validation results from media experts state that the average aspects of display design aspects, audio, video, animation, and ease of use of media in interactive learning media based on articulate storylines on side space building materials flat is 92.9%. This means that the assessment results of the two validators for media validation are "valid".

After going through the validation stage, the interactive learning media was tested. This development trial was carried out in two stages, the first was a small group trial and a large group trial. In this small group trial conducted in class IX as many as 6 people. Of the 6 students who responded, one of the children made a comment/suggestion that the speaker's voice was not clear, this comment/suggestion has been corrected so that the results of this small group trial are used to revise Draft II to produce Draft III. On May 16, 2022 draft III was tested on a large scale on 30 students of class VIII-2 at SMP Negeri 1 Botumoito with a one-group pretest-posttest design, namely in this design there was a pretest before being given treatment and then a posttest was given after treatment / treatment. Based on the results of the field trial, the students' pretest results before using interactive learning media are as follows:

Table 3. Pretest Results

Ability	total	Average score
Very good (91-100)	-	-
Well (81-90)	-	-
Enough (70-80)	15	72,3
Not enough (<70)	15	64,4

Based on table 3, it can be seen that from 30 students, 15 students got an average score of 64.4 below the minimum completeness criteria, with a less category and 15 other students got an average score of 72.3 above the minimum completeness criteria with enough category. After using interactive learning media, the posttest results from 30 students are as follows:

Table 4. Post test results

Ability	total	Average score
Very Good (91-100)	4	94,38

Well(81-90)	18	84,67	
Enough (70-80)	8	74,38	
Not enough (<70)	-	-	

Based on table 4, it can be seen that after using interactive learning media the posttest results of 30 students, there were 8 students getting an average score of 74.38 in the sufficient category, 18 students getting an average score of 84.67 with a good category and 4 students get an average score of 94.38 in the Very Good category. Thus we can conclude that after using articulate storyline-based learning media, student learning outcomes increase.

The results of the student response questionnaire, the use of Articulate Storyline-based learning media in the flat-sided building material are as follows:

Table 5. Student Response Results

No	Responded aspect	Presentase					
		SS	S	R	TS	(SS+S)	(R+TS)
1	Articulate Storyline learning media is easy to use	53,3	30	16,7	0	83,3	16,7
2	The language used in the Articulate Storyline learning media is easy to understand	23,3	63,4	13,3	0	86,7	13,3
3	After I finished using the Articulate Storyline learning media, it was easy for me to master the flat side space building material	16,7	53,3	30	0	70	30
4.	The information in the Articulate Storyline learning media is easy to understand	30	56,7	13,3	0	86,7	13,3
5.	The learning instructions in the Articulate Storyline learning media are clear, making it easier for me to use them	30	56,7	13,3	0	86,7	13,3
6.	The pictures/photos in the Articulate Storyline learning media are in accordance with the content of the material so as to facilitate my understanding	26,7	70	3,3	0	96,7	3,3
7.	The choice of font, font size and spacing is correct, making it easier for me to read Articulate Storyline learning media	30	70	0	0	100	0
8	The color display of the Articulate Storyline learning media is right, making it easier for me to read	43,3	56,7	0	0	100	0
9	This Articulate Storyline learning media is very interesting so that it motivates me to study the material for building flat side spaces	26,7	70	3,3	0	96,7	3,3
10	The Articulate Storyline learning media makes it easier for me to understand the material for building flat sides	16,7	63,3	20	0	80	20
11	The contents of the Articulate Storyline learning media are	23,3	76,7	0	0	100	0

No		23,3	76,7	0	0	100	0
	interesting to read						
12	The Articulate Storyline learning media has an interesting layout/layout to read	23,3	76,7	0	0	100	0
13	The font size used is right so I am interested in reading the Articulate Storyline learning media	20	76,7	3,3	0	96,7	3,3
14	The Articulate Storyline learning media uses the right combination of fonts so I'm interested in reading it	23,3	73,3	3,4	0	96,6	3,4
15	The Articulate Storyline learning media adds to my curiosity in learning the material for building flat-sided spaces	16,7	63,3	20	0	80	20
16	This Articulate Storyline learning media makes me active in asking if there is material that has not been understood	13,3	66,7	20	0	80	20
Average Percentage						90,01%	9,9%

Based on table 5, it can be seen that the results of the student responses reached 90.01% which indicates a very positive response. Thus, it can be concluded that the use of articulate storyline-based learning media on the flat-sided building material in the learning process is very good.

Thus, the Articulate Storyline-based learning media on the flat-sided geometrical material is said to be valid, judging from the results of the validation by material experts and media experts, getting an assessment of 95.8% and 92.9%, respectively, and it is said to be effective as seen from the results of the learning test there is an increase. Initially 15 students got an average score of 64.4 below the minimum completeness criteria for SMP Negeri 1 Botumoito with a less category and 15 other students scored 72.3 above the minimum completeness criteria with a sufficient category which increased after using articulate storyline-based learning media 8 students got an average score of 74.38 in the moderate category, 18 students got an average score of 84.67 in the good category and 4 students got an average score of 94.38 in the Very Good category, while it is said to be practical to see from the results of the student response questionnaire, the use of learning media based on Articulate Sto ryline on the flat-sided building material reached more than 85%, namely 90.01% which indicates a very positive response. So that the articulate storyline-based learning media can be said to be of good quality and effective as an alternative learning media for mathematics. This Disseminate stage is carried out on a small scale, where the researcher distributes Draft III which has been tested to be distributed to all VIII grades in SMP Negeri 1 Botumoito by distributing url links for Articulate Storyline-based learning media to students via the WhatsApp application using the help of mathematics teachers and students of class VIII-2.

CONCLUSION

Based on the research and development that has been carried out, it can be concluded that the Articulate Storyline-based learning media on the flat-sided building material using the 4-D model (Four D Model) is said to be of good quality and effective as an alternative learning media for mathematics seen from the validation results. by material experts and media experts who received an assessment of 95.8% and 92.9%, respectively, and seen from the results of the learning test there was an increase, initially 15 students got an average score of 64.4 below the minimum completeness criteria for SMP Negeri 1 Botumoito in the less category and 15 other students got a score of 72.3 above the minimum completeness criteria with a sufficient category which increased after using articulate storyline-based learning media to 8 students getting an average score of 74.38 in the sufficient category, 18 students getting an average score of 74.38 an average of 84.67 with good category and 4 students get an average value of 94.38 in the Very Good category, while judging from the results of the student response questionnaire, the use of Articulate Storyline-based learning media in the flat-sided building material reaches more than 85%, namely 90.01% which indicates a very positive response.

The implications of the research on the development of learning media based on Articulate Storyline on the flat-sided building material are:
1. Implications for students to be able to increase learning independence and to be able to do their own assessment of mathematical abilities, especially the material for building flat sides.
2. The implications for schools, especially for grade VIII mathematics teachers, can be a source of learning and reference in developing and arranging a more interactive learning atmosphere as demanded by the 2013 curriculum, especially on the material for building flat-sided spaces.
3. Implications for other researchers can be a reference for conducting relevant research at a further level with different materials.

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