

Development of Interactive Learning Media on Simple Flat Buildings Material "BADANA" for Students Grade III Elementary School

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Abstrak

Tujuan penelitian ini yaitu guna menghasilkan produk dari rancangan media pembelajaran interaktif *articulate storyline* "BADANA". Penelitian ini mendeskripsikan mengenai kelayakan media yang dihasilkan dari validasi dari ahli bahasa, media serta ahli materi. Selanjutnya respon guru dan siswa sebagai pengguna dari media pembelajaran interaktif "BADANA". Model yang dipakai yaitu model ADDIE meliputi atas lima tahap diantaranya analisis, desain, pengembangan, implementasi serta evaluasi. Selanjutnya untuk subjek penelitian yakni siswa kelas III salah satu SD Negeri di Sindanglaya. Kelayakan media pembelajaran interaktif ini menghasilkan bahwasanya presentase penilaian dari ahli materi senilai 100% kategorinya "Sangat Layak", dari ahli media senilai 96,1% kategorinya "Sangat Layak" dan dari ahli bahasa senilai 91,6% kategorinya "Sangat Layak". Sementara persentase tanggapan dari guru senilai 93,7% dengan kategori "Sangat Layak" sehingga menandakan bahwasanya media pembelajaran interaktif ini bisa dipergunakan oleh siswa. Selepas siswa mempergunakan media pembelajaran interaktif pada uji coba lapangan, respon siswa ada dalam kategori "Sangat Layak" dengan persentase senilai 95,9%. Oleh karena itu media interaktif *articulate storyline* "BADANA" bisa dipergunakan sebagai alternatif dalam proses pembelajaran yang bisa mengatasi kurangnya minat siswa ketika belajar matematika terkhusus pada materi bangun datar dan sifat-sifatnya.

Kata kunci: *Articulate Storyline*, Bangun Datar Dan Sifat-Sifatnya, Media Pembelajaran Interaktif, Prosedur ADDIE.

Abstract

The purpose of this research is to produce a product from the design of interactive learning media articulating the "BADANA" storyline. This study describes the feasibility of media resulting from the validation of material experts, media experts, and linguists. Furthermore, the response of teachers and students as users of the use of interactive learning media "BADANA". The model used is the ADDIE model which includes five stages including analysis, design, development, implementation, and evaluation. Furthermore, for the subject of this study, namely class III students one of SD Negeri in Sindanglaya. The feasibility of this interactive learning media resulted in that the percentage of assessments from material experts was 100% in the "Very Feasible" category, from media experts it was 96.1% in the "Very Feasible" category and from linguists it was 91.6% in the "Very Feasible" category. While the percentage of responses from teachers was 93.7% in the "Very Feasible" category, indicating that this interactive learning media can be used by students. After students used interactive learning media in field trials, student responses were in the "Very Feasible" category with a percentage of 95.9%. Therefore the interactive media articulate storyline "BADANA" can be used as an alternative in the learning process which can overcome the lack of interest of students when learning mathematics, especially on flat material and its properties.

Keywords: *Articulate Storyline*, Flat Shape and Its Properties, Interactive Learning Media, ADDIE Procedure.

Received: June 13, 2023/ Accepted: July 21, 2023 / Published Online: July 31, 2023

INTRODUCTION

Mathematics is a subject that plays a positive role in the realization of a dignified and intelligent society through logical thinking and a critical attitude (Syahputri, [2018](#)). Students must learn mathematics through efforts in various activities that take place in the learning process (Rostika & Junita, [2017](#)). Thus, students in learning activities are expected to be able to solve problems in everyday life and can develop their mindset so that learning mathematics can benefit students. So, it can be said that learning mathematics plays an important role in everyday life so that human thinking becomes advanced.

At this time, although mathematics plays an important role in human life, this lesson is considered by many students to be a frightening lesson. This is in line with Khaesarani & Hasibuan ([2021](#)) who stated that many students think that math is difficult. Most students consider math to be a scourge at school and similar to a ghost. This is due to the delivery of mathematics material, teachers still deliver material conventionally so that the material looks less interesting (Rahmatia et al., [2017](#)) In line with this, Pangesti & Retnowati ([2017](#)) also said that currently the process of learning mathematics in schools tends to be conventional, this can be seen from the sources used during the learning process only in textbooks and teachers in the classroom still dominate when explaining the material.

The conventional teaching style of teachers has an impact on the difficulty of students in mastering mathematics material, one of which is about flat shapes. From what we know that in mathematics learning in elementary school there is flat building material. For the flat building material itself, difficulties are still found when delivering the material. According to (Simbolon et al., [2019](#)) geometry is one of the most important parts of mathematics, but most students still cannot develop a strong conceptual in the geometry material. This is because understanding the concept of flat building material must be conveyed appropriately.

In line with this, the effort to achieve the desired learning objectives appropriately is by using learning media which is very important of course for students (Tafonao, [2018](#)). In connection with the existence of learning media, a more conducive teaching and learning atmosphere will be created, making it easier and delivering students who still think concretely to better understand mathematical material that tends to be abstract and complex (Machmud, Sartika & Achmad, [2022](#)).

Based on the results of interviews with the third grade teacher of SDN 068 Sindanglaya, information was obtained that the understanding of the material on the types of flat shapes and their properties was still low. This is because students still find it difficult to learn the material of various kinds of basic shapes and their properties. Students' interest and knowledge of the

material of flat shapes and their properties is still lacking. One of the contributing factors is that the learning media for mathematics is still not varied and innovative. From these problems, it can be seen that the teacher's follow-up on these problems is still not optimal due to the lack of media and tools to improve students' understanding. The media commonly used in Mathematics learning on the material of various kinds of flat shapes and their properties is books. Facilities at school such as computers and projectors that are available are still not utilized as well as possible.

So, efforts to increase students' interest and knowledge of flat building material require the help of learning application technology. Based on Government Regulation No. 74 of 2008 Article 3 paragraph 4 that "the ability of teachers in managing student learning at least includes the competence of utilizing technology in the learning process". This research is assisted by *articulate storyline software*. The meaning of the application is software that is generally used in presentation and communication media. (Pratama, [2019](#)). This media itself is a *multimedia authoring tool*, one of which can be used during the process of creating interactive learning media, namely with video content, animation, sound, graphics, images and a combination of text (Kurniawan, [2020](#)). In previous findings by (Rafmana, Chotimah & Alfiandra, [2018](#)) that *Articulate Storyline* is useful in efforts to increase the attitude of wanting to learn students who are potentially effective, practical and very valid.

The difference between current research and previous research is seen in terms of material content and types of methods and development models. The media to be developed by researchers is about interactive learning media *articulate storyline* material Simple Flat Buildings "BADANA", which is related to the material of various flat shapes and properties of flat shapes. Then the subject and object of research conducted by researchers are also different from previous studies so that the results of the research made will be different from previous studies.

In connection with this *articulate storyline* media, it is hoped that students will not feel bored and saturated because the learning process will be more fun with the media. Seeing the reality of these various situations, the researcher intends to design interactive learning media *articulate storyline* simple flat building material in grade III elementary school.

In the explanation above, we can know that this research aims to produce a product from the development of interactive learning media *articulate storyline* "BADANA", describe the feasibility of media from the results of expert validation, and to find out the user's response, namely teachers and students to the use of interactive learning media "BADANA".

METHOD

The ADDIE model with the D&D development research method was used by the researcher. Research on the Development of Interactive Learning Media *Articulate Storyline* Simple Flat Buildings Material "BADANA" in Mathematics Subjects in Grade III elementary school is included in product design and development research. This is because the research studied focuses on research on the design and development of certain products, which will later gain knowledge *outcomes* from developing these products and being able to analyze the situation based on facilities from the use of successful products.

The meaning of the model is a model that leads to students and becomes a model based on learning media. (Siregar, [2019](#)). There are five stages of this model, namely analyzing, designing, developing, implementing and evaluating . In the analyzing stage, researchers can analyze the characteristics and needs of students, analyze the characteristics of students, and analyze the material and goals of students. Then at the design stage researchers make visual requirements on interactive learning media. At the development stage the researcher enters the *assets*, background, backsound, and images that have been made at the design stage. At the implementation stage, namely testing interactive learning media products that will be carried out in class III elementary schools consisting of samples of teachers and students. And at the evaluation stage, this tends to use formative evaluation which is because it is related to the stages of development research to improve the products developed during the media development process from the analysis stage to the implementation stage. The approach used by researchers when collecting data is a qualitative and quantitative approach (*mixed method*).

This research design is useful in the creation and development of interactive media *articulate storyline* "BADANA" in learning which contains material on the types and properties of flat buildings in grade III elementary school students. A number of participants in testing this media include third grade students at SDN 068 Sindanglaya, third grade teachers, linguists, material and media experts . Researchers collected data through questionnaires and interviews. The interview process took place with one third grade teacher, while the validation questionnaire was distributed to linguists, material experts and media experts. The linguist validator was Dr. Kurniawati, M.Pd., the material expert was Dra. Hj Deti Rostika, M.Pd., and the media expert was Intan Permata Sari, S.ST, M.Ds. The response questionnaire was given to one teacher and twenty-three students to test the appropriateness of the learning media. The scale of the experts' questionnaire sheet starts from 1-4 with very poor to very good criteria. The data obtained by researchers are qualitative and quantitative data. For quantitative data in the form of scores obtained during the validation process.

Then the percentage data that has been obtained is continued in the form of qualitative data (Riduwan, [2016](#)). Presentation of qualitative data in the form of descriptions includes suggestions and comments from experts. There are teacher and student response questionnaires and validation sheets. Furthermore, the results of the questionnaire assessment were summed up and then the results were averaged. The following is presented the score results obtained according to the category at [Table 1](#).

Table 1. Questionnaire Validation Criteria

Percentage	Category
0-20%	Not Feasible
21-40%	Less Feasible
41-60%	Decent Enough
61-80%	Worth
81-100%	Very Feasible

Data analysis used in managing data is through the process of calculating the percentage of the average value of each part of the questionnaire, with the formula :

$$P = \frac{S}{N} \times 100\%$$

Description:

P= Percentage number

S= The number of scores obtained

N= Number of ideal scores

RESULTS

Stage 1. Analysis

The first stage of the ADDIE model is the analysis process. This stage is passed by several stages including analyzing the characteristics and needs of students. According to the results of interviews with teachers, we can analyze that learning mathematics at school, especially in the material of flat shapes and their properties, is a teaching and learning process using cardboard paper media and complemented by the lecture method and using learning resources from theme books. In this situation so that students still lack interest and make bored when learning math, especially in the material of flat shapes and also their properties, it is because the media used is considered less interactive.

At the stage of analyzing the characteristics of students, grade III elementary school is still at the age of 8-9 years. In this case, based on the theory of Piaget's stage of development (Nuryati & Darsinah, [2021](#)) the characteristics of students at this age are considered to be still in the concrete operational stage so that students need learning media to facilitate the understanding process and to provide an overview of the material that has been taught. This can be seen from the teacher interview who said that grade III elementary school students still need learning media, but are still lacking in implementing the use of interactive learning media.

At the stage of analyzing material and learning objectives, based on the results of interviews with grade III elementary school teachers, it can be said that the interest and interest of students in the material of flat shapes and the properties of flat shapes are still lacking because they are considered rather difficult to learn so that researchers will develop the material in the process of making interactive learning media. The material developed in making interactive learning media is based on the Basic Competencies (KD) of Mathematics 3.12, namely analyzing various flat shapes based on their properties and 4.12 classifying various flat shapes based on their properties contained in thematic class books for grade III elementary school theme 8 (Prajaya Muda Karana).

With the design of interactive learning media on flat shapes and their properties "BADANA", it is hoped that it can add innovation in learning, especially in learning mathematics so that with the innovation in making interactive learning media *articulate storyline* can increase the interest and attractiveness of students in learning learning material.

Stage 2. Design

In the design stage, researchers make visual needs including images, *buttons*, graphic elements, and *backgorunds*. Visual needs are made using the Canva application and using the elements in Canva.

In the process of making *assets* and buttons in BADANA using a logo size of 500 x 500 pixels using various elements according to the desired needs in the process of making BADANA interactive learning media.

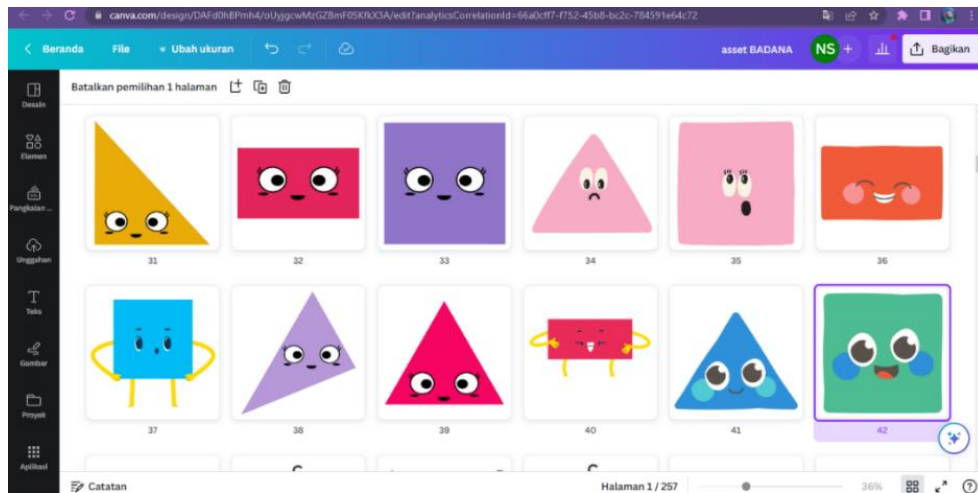


Figure 1. Asset design in BADANA

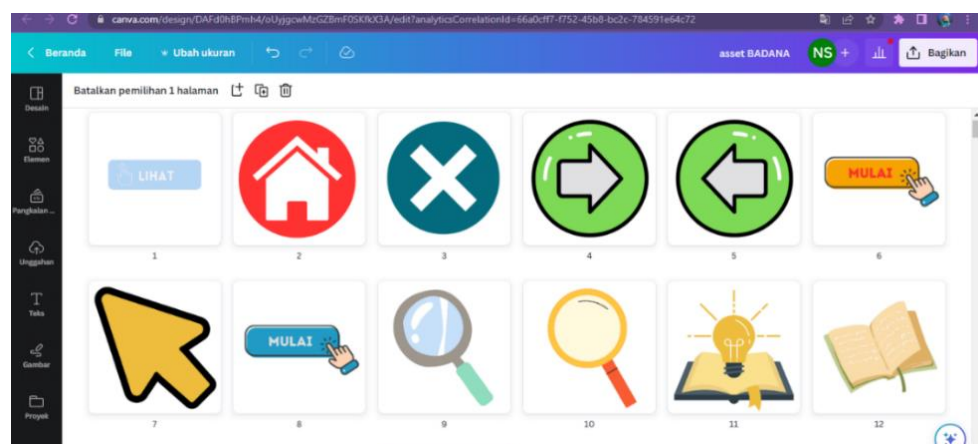


Figure 2. Button design in BADANA

Next, the process of making graphic elements is adjusted to the color concept that will be made in interactive learning media. The page size used in making graphic elements is 720 x 405 pixels.

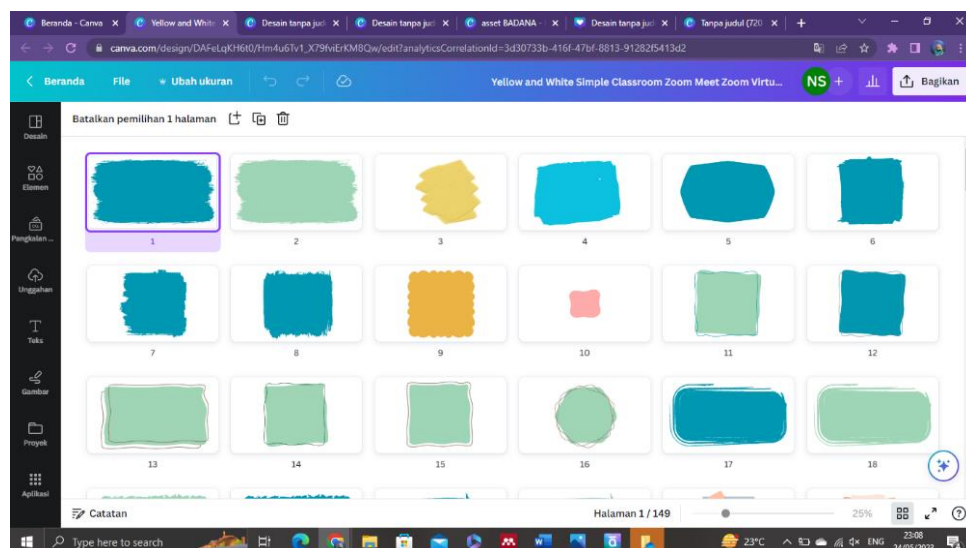


Figure 3. Graphic Elements

The next stage is to make a *background* design that is tailored to the concept of BADANA interactive learning media. In making this *background* using a size of 720 x 405 pixels. The *assets* used in the *background* are also taken from the canva application.

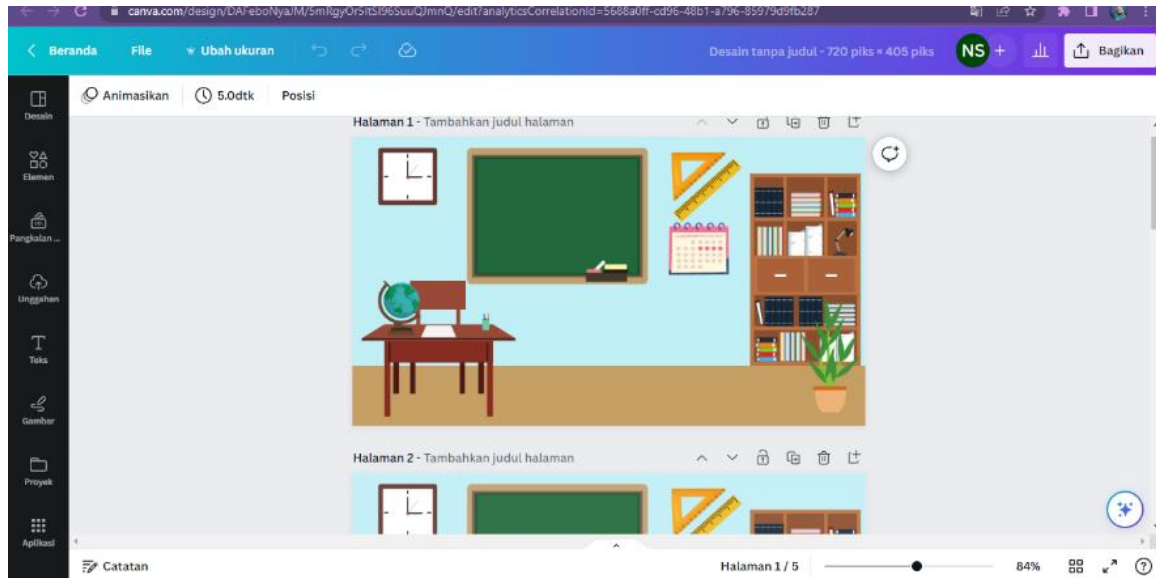


Figure 4. BADANA *Background* Design

In addition to the use of assets and images on interactive learning media, researchers also added supporting audio that aims to be used as a backsound at the opening of learning media. Researchers also recorded audio for the learning media. The audio used by researchers was obtained from *pixabay.com*. The following is a view of the *pixabay homepage*.

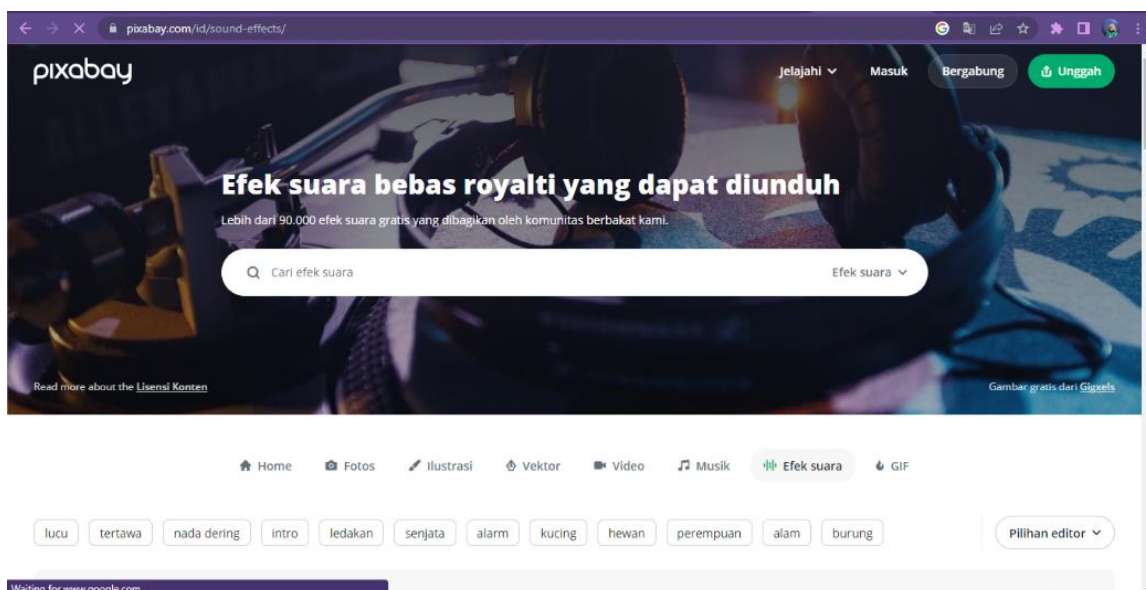


Figure 5. Home *pixabay*



Stage 3. Development

There are a number of steps in the development stage including making interactive learning media products *articulate storyline* "BADANA", media, language and material expert validation.

Product Development

The first step in the product development process is to prepare the *software* to be used, namely *articulate storyline*. There are several elements in this interactive learning media *articulate storyline* "BADANA" including media images, audio, learning materials, and practice questions.

Table 2. Product Development of Interactive Learning Media "BADANA".

Scene	Visualization Description
<i>Splash Screen</i> Display	 The splash screen features the word "BADANA" in large, bold, black letters at the top. Below the text are three cartoon characters: a yellow square on the left, a pink triangle in the center, and a green square on the right. They are all smiling and have small wings. The background is a light blue sky with white clouds and a faint city skyline.
Start view/beginning view BADANA	 The start view shows two cartoon children, a boy and a girl, standing on a green lawn. Between them is a large yellow rectangular screen with a blue border. The screen displays the text "BANGUN DATAR DAN SIFAT-SIFATNYA" in black, with a small red and yellow logo above it. Below the text is a blue button with the word "MULAI" in white. A hand icon is pointing at the button. The background is a light blue sky with white clouds and a faint city skyline.

Main Menu



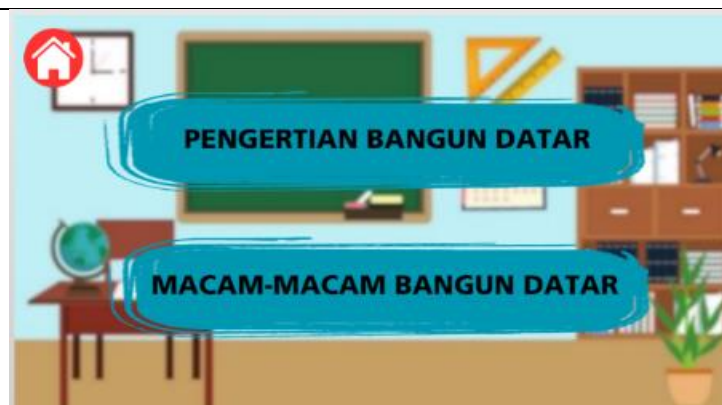
Display Instructions

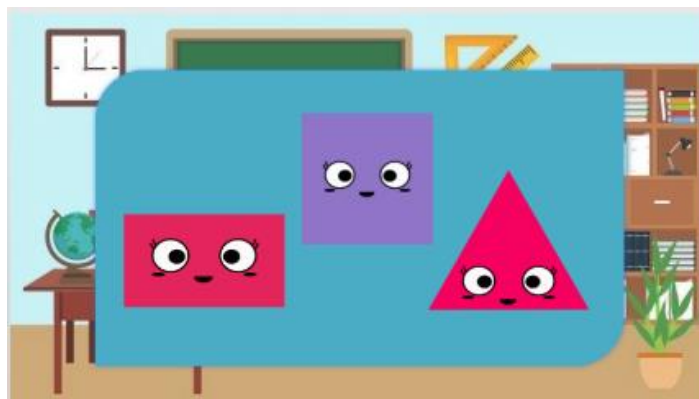


KD and indicator display

KD & INDIKATOR	
KOMPETENSI DASAR (KD)	INDIKATOR PENCAPAIAN KOMPETENSI
3.12 Menganalisis berbagai bangun datar berdasarkan sifat-sifat yang dimiliki.	3.12.1 Menganalisis berbagai bangun datar berdasarkan sifat-sifat yang dimiliki dan memberikan contoh dalam kehidupan sehari-hari.
4.12 Mengelompokkan berbagai bangun datar berdasarkan sifat-sifat yang dimiliki.	4.12.1 Menyajikan contoh bangun datar dengan menggunakan gambar atau benda-benda konkret berdasarkan sifat-sifatnya.

Material display





Quiz view





After the interactive learning media product "BADANA" has been developed in *articulate storyline*, the next step is to publish it in html5 format. Then the design results of the *articulate storyline* in the form of a (.story) file are exported into a (.html) file to make it easier for users to access the media online. The usefulness of exporting media in the form (.html) is also to make it easier to run the media without having to install articulate storyline on the user's device. If the link has been converted into *html*, the interactive learning media "BADANA" can be used on *mobile phones* and laptops as long as it has a link in its use.

Product Validation of Interactive Learning Media "BADANA"

Researchers validated the interactive media articulate storyline "BADANA" to linguists, materials and media to get an assessment of the feasibility of interactive learning media "BADANA". The media expert validator was Mrs. Intan Permata Sari, S.ST, M.Ds., while Mrs. Dra. Hj. Rd. Deti Rostika, M.Pd. was the material expert, and the linguist was Dr. Kurniawati, M.Pd. The following are presented the validation results of the three experts.

Table 3. Recapitulation of Expert Validation Test Results

No.	Validator	Expert Assessment Aspect	Value
1	Validator 1	Media Expert	96,1%
2	Validator 2	Material Expert	100%
3	Validator 3	Linguist	91,6%
Average Final Score			95,9%

According to the [Table 3](#), it can be seen that the percentage of material expert assessment is 100% and the category is "Very Feasible", for the percentage of media experts worth 96.1% and the category is "Very Feasible" and from linguists worth 91.6% and the category is "Very Feasible". So that the recapitulation of the validation test results from linguists, media and material experts is worth 95.9%. So it can be concluded that the results of this articulate storyline "BADANA" interactive media research are said to be "Very Feasible" to be used by students when studying in grade III elementary school.

Stage 4. Implementation

After the media is validated by material experts, media experts, and linguists, then revisions are made and declared feasible. Then the next stage is to implement the interactive learning media product "BADANA" through a limited trial to see the response of teachers and students when applying interactive media "BADANA" during learning. The trial process was conducted on one teacher and 23 students of SDN 068 Sindanglaya. Before implementing the use of the media, each learner is given an explanation of the procedures for using interactive learning media along with the procedures for filling out the questionnaire instrument which will be given directly as a response and also a sign of having observed the media product developed and tested directly.

The acquisition of teacher and learner responses was obtained through the process of filling out a response questionnaire consisting of three aspects including media technical quality, instructional/learning quality, and content/material quality. Collecting response data from teachers and students is also collected directly, after previously being made and also *printed out and* then distributed to teachers and students. If there are revisions, the researcher will carry out revisions to the media products that have been developed based on comments, input and suggestions from related parties such as teachers and students.

Teacher User Response

Teacher user response is obtained from the results of the response questionnaire assessment including 12 statements related to technical, instructional and material aspects. The results of the teacher's assessment of the interactive learning media "BADANA" are as follows:

Table 4 Results of Teacher Response Questionnaire

No.	Aspects	Indicator	Question Item	Maximum Score	Score Acquisition
1	Content/Material Quality	Accuracy	2	8	7
		Interest/Attention	1	4	4
		Completeness	1	4	4
2	Instructional Quality	Providing learning assistance	2	8	8
		Motivating	1	4	3
		Impact on teachers	1	4	4
3	Technical Quality	Readability	1	4	4
		Ease	2	8	7
		Design quality	1	4	4
Total					45
Percentage %					93,7%

According to the results above, it shows that the interactive media *articulate storyline* simple flat building material "BADANA" in mathematics subjects grade III elementary school category is very feasible. Furthermore, statements from teachers are also in the form of good responses, namely learning media and learning media that are conveyed to students are fun, interesting and easy to understand for students.

Learner User Response

The acquisition of learner user responses is the result of filling out a response questionnaire consisting of ten statement items related to technical quality aspects, instructional quality aspects, and content/material quality aspects. Learner user responses were obtained from twenty-three third grade elementary school students. The following is presented the user response.

Table 5 Results of the Learner Response Questionnaire

No.	Aspects	Indicator	Question Item	Maximum Score	Score Acquisition
1	Content/Material Quality	Accuracy	1	92	91
		Benefits	1	92	86
		Interest/Attention	1	92	87
2	Instructional Quality	Evaluation	1	92	88
		Impact on learners	3	276	268
3	Technical Quality	Readability	1	92	86
		Ease	1	92	89
		Design quality	1	92	88
Total					883
Percentage %					95,9%

The results of the accumulated percentage of learner user responses have an average of 95.9%. This average falls into the very feasible category by having aspects of technical quality, instructional quality, and content/material quality. Suggestions and comments from students did not provide suggestions for improvement but rather commented on the positive experience of using interactive teaching and learning media "BADANA".



Figure 6 . Learners using Interactive Learning Media "BADANA"

Stage 5. Evaluation

At the evaluation stage, it is carried out from each stage. Product design and development research conducted by researchers goes through several stages including analyzing as a form of initial data to collect information, then in this initial data the researcher begins to continue the next activity, namely the design stage. At this design stage, researchers get a little obstacle, namely when looking for sources of images to be used but can be resolved by using the Canva application.

In the development stage, the media development process is carried out using *articulate storyline software*. This development stage is carried out validation tests carried out by material experts, media experts, and linguists. At this validation stage, several experts gave suggestions, including media experts giving advice on the media to be given a sound background in the initial *scene of the* interactive learning media "BADANA", adding a *voice to* each question in the questions and materials. In the triangle image material, a white *background is* added and the *button is* differentiated in color / shape. Linguists provide suggestions including the use of language in the interactive learning media "BADANA", namely improving the grammar on the word beside is corrected to beside, and the word below is corrected to below.

At the implementation stage, the activities carried out were testing the interactive learning media "BADANA" to find out the responses of teachers and students. The teacher gave positive comments, including that the learning media and learning media delivered to students were easy to understand, interesting and fun for students. The teacher also gave suggestions to pay attention to students who were less focused on learning. For students, no one provided suggestions for improvement but rather commented on the positive experience of using interactive learning media "BADANA".

DISCUSSION

The purpose of the process of developing interactive learning media articulate storyline "BADANA" is to obtain a learning media product for third grade elementary school students in mathematics. This interactive media "BADANA" is developed in the form of a website that can be accessed by each student.

The model used in the development process is the ADDIE model. The meaning of the ADDIE model is a student-directed model and also includes a model based on learning media. (Siregar, [2019](#)). There are five stages in this model including analysis, design, development, implementation, and evaluation.

According to the results of the recapitulation of the assessment of the questionnaire that has been filled in by the material expert, it shows that the material developed in the articulate storyline interactive media on the material of simple flat buildings "BADANA" for grade III Mathematics lessons gets a score of 100% and the category is very feasible. Furthermore, the results of the media feasibility test were obtained by filling out a questionnaire by media experts. According to the results of the recapitulation of the assessment of the questionnaire that has been filled in by media experts, it indicates that the category of media to be developed by researchers is included in the very feasible category with a score of 96.1%. As well as the results of the recapitulation of the assessment of the questionnaire that has been filled in by linguists indicate that the use of language in the interactive media articulate storyline on the material of simple flat buildings "BADANA" Mathematics lessons grade III elementary school gets a score of 91.6% the category is very feasible.

The recapitulation of the assessment results carried out by experts, both material experts, media experts, and linguists is 95.9%. So it can be concluded that the results of this interactive learning media research *articulate storyline* "BADANA" is said to be "Very Feasible". This is in accordance with research conducted by Fatia and Ariani ([2020](#)) , Husain and Ibrahim ([2021](#)) , and Syafitriyani ([2022](#)) that *Articulate Storyline* interactive learning media is said to be feasible and good for testing to users in the learning process.

The users of the interactive learning media "BADANA" consist of one grade III elementary school teacher and 23 grade III elementary school students. User response in connection with the use of the media is obtained from the results of the response questionnaire. The response results from the teacher have a percentage of 93.7% and the category is "Very Appropriate". Therefore, the interactive learning media "BADANA" can be said to be tested on students. Then there are suggestions from the teacher, namely paying attention to students who are less focused on learning.

Then the user response was obtained from twenty-three students directly, namely through the process of filling out the student response questionnaire after the media trial. The percentage result of student response is 95.9% and the category is very feasible. The response given by students to the interactive learning media "BADANA" is a positive response, active students in learning and enthusiastic in participating in learning activities. Then the learning process becomes more meaningful.

So it is concluded that the response of teachers and students as users is "Very Good" to the interactive learning media "BADANA". This is in line with previous research by Sari and Harjono (2021) that the *articulate storyline* interactive media is considered good and feasible to use during learning in elementary school.

CONCLUSION

The articulate storyline interactive media "BADANA" used during learning on the material of flat buildings and their properties for third grade elementary school students is considered feasible to develop. The basis used for this conclusion is according to the validation results obtained from linguists, material and media experts. The presentation obtained from the assessment of media experts is 96.1% in the "Very Feasible" category. Furthermore, for material experts, the percentage is 100% in the "Very Feasible" category. While the percentage of linguist assessment is worth 91.6% of the "Very Feasible" category. According to the validation results indicate that the interactive media *articulate storyline* "BADANA" is very feasible to use during learning. Then, the media user response using a questionnaire instrument to students and teachers. The percentage of the average teacher response score is 93.7% with the category "Very Feasible" while the percentage of assessment from students with a value of 95.9% with the category "Very Feasible". The score indicates that grade III elementary school students are considered very feasible to use *articulate storyline* media in the learning process. Thus, it can be concluded that the application of interactive multimedia-based media *articulate storyline* in the learning process is "Very Feasible". In connection with this research, it is hoped that the development process of *articulate storyline* learning media "BADANA" can make the quality of teaching from teachers can improve, namely on the material of flat shapes and their properties.

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