



# Development of Learning Media Using Articulate Storylines to Increase Student Motivation in Mathematics Subjects in Elementary Schools

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**Abstract:** The purpose of this research is to develop learning media based on articulate storylines that are used to increase elementary school students' learning motivation in learning Mathematics. Study This use research methods development (Research and Development or R&D). Research using model study Which adapted from development models ADDIE. This model uses 5 stages that is analysis stage, *Design, Development, Implementation, and Evaluation*. Study this is done in 3 schools namely SDN 18, SDN 24 and SDN 30 Payakumbuh City. Province Sumatra West. Data collection was carried out through product validation, interviews, observation, questionnaires, and documentation. Data analysis in this study is an analysis of product validity, product practicality and product effectiveness. The results of media validation get a value of 82%, from the validation of language experts get a value of 100%, from the validation of construct experts get a value of 95% and from the results of the material validator get a value of 87%. So that the results are 91% and with the description "very valid" and this product is feasible for trials. The average value of the feasibility test for learning media products is 88.5% which is included in the very feasible category. Distributed from field trials in the 3 schools, the results were 91.33% with the category of students having very high motivation in learning mathematics by using articulate storyline learning media.

**Keywords:** Articulate Storylines; Learning Media; Students Motivation

## Introduction

Education is efforts to create an active learning that can develop the capabilities of an individual (Husain & Kaharu, 2020; Silber-Varod et al., 2019). This is in line with Law no. 20 of 2003 Chapter 1 Article 1 concerning the National Education System which explains that education is a conscious and planned effort to create a learning atmosphere and learning process so that students can be active to develop abilities within themselves to have spiritual strength, self-control, personality, intelligence, morals knowledge and skills needed by himself, society, nation and state (Noor, 2018).

Knowledge necessary mastered in education moment this is mathematics. Mathematics is a science that needs to be in education (Helsa et al., 2021; Sultan et al., 2021). As we already know, mathematics too needed in other sciences. According to (Dewi & Izzati, 2020) Mathematics is one of the subjects required by the Minister of Education. In mathematics students are taught to think systematically, critically, creatively, logically and analytically. Mathematics is also an abstract science. Therefore, to provide mathematical knowledge to students in elementary schools, abstract learning is needed (Dewi & Izzati, 2020). Mathematics is a branch of science that studies quantity, space, structure and change (Fitria et al., 2018; Sultan et al., 2021).

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According to a survey of elementary school students, it was found that 85% of students said that learning mathematics was included in the difficult category, so learning mathematics was always feared by students. Mathematics in fact is abstract science, because of that students have difficulty in understand learning mathematics because students cannot see the form of concepts when learning mathematics (Dewi & Izzati, 2020). Mathematics as a compulsory subject. Systematic, critical, logical, and creative thinking are ideas that can be developed with mathematics education. Moreover, students do not like it because mathematics is often mistaken for a subject that is not easy. Teachers are not fully involved in learning that is creative, active and innovative in attracting students' interest. Students will be motivated to learn if the teacher is involved in learning and delivers material in an interesting way. Educators must have the choice to take from various sources of understanding, take from the latest sources at this time, because there are many developments in learning in the realm of schooling (Sulistiawati, 2020; Susilowati, 2018).

The use of learning methods and media is very important in teaching which is used by the teacher to provide a subject matter that is very decisive for the success of the learning process (Tohani & Aulia, 2022; Wahyuningtyas & Sulasmono, 2020). Seeing the benefits of learning media which is a very important element in the learning process is carried out especially learning at this time. Media helps deliver messages, lesson content and can also increase students' learning interest. The main use of media uses ICT-based media which can help students to understand more about the subject matter and can increase knowledge for students to be able to operate technology properly during the learning process (Alika & Radia, 2021; Budiana et al., 2015). By utilizing learning media students are increasingly motivated to learn.

It is necessary to have the right media for learning mathematics in order to remove students' perceptions that mathematics is difficult. Mathematics learning media is a tool or means used in the process of learning mathematics to help students understand concepts and improve their skills in solving mathematical problems (Muhali, 2019). Some examples of mathematics learning media are textbooks or textbooks. Quality packaged books can be effective learning media because they provide clear and systematic learning about mathematical concepts, besides that textbooks can also contain practice questions to test students' understanding (Maryatun, 2015; Silfiani et al., 2022) said that the source of the study was not only in printed form such as books that were spread on generally. But you can also use learning tools such as interactive videos,

satellite communications, television, personal computers, e-mail and other multimedia computer technologies. The media can produce a relationship between the teacher and students in other terms, there is feedback during learning.

One of the computer programs that can be developed into learning media is the Articulate Storyline 3 program (Khusnah et al., 2020) the Articulate Storyline 3 program can be used to create interactive learning media. Computer-based interactive learning media has more value than ordinary printed learning materials (Fatia & Ariani, 2020). Interactive learning is able to activate students to learn with high motivation because of their interest in multimedia systems that are able to display text, images, videos, sounds and animations (Sultan et al., 2021). With the development of interactive learning media, it is hoped that it can help and facilitate students in understanding the subject matter and when working on practice questions, especially in mathematics.

*Articulate Story line* is a software mix programming tool that can help learning designers from beginner to advanced levels. The Articulate Storyline program has the advantage of being a simple smart brain ware with interactive tutorial procedures through templates that can be published offline or online, making it easier for users to format in the form of personal web, CD, word processing, and Learning Management System (LMS) (Juhaeni et al., 2021). In addition, the Articulate Storyline 3 program is multimedia-based, namely a combination of various forms of media (file formats), namely in the form of text, graphic images, sound, video, interaction, etc., which are packaged into digital files that are used to convey messages to the public (Fajrun, 2021).

Based on the observations that have been made, it is found that in the learning process the teacher still uses lecture, practice and assess methods. While many things that become curriculum goals are not achieved because one of them has not created appropriate learning and which will lead students to achieve learning goals. Good learning, guided by the objectives of the curriculum, and how the learning process takes place. If only the lecture method, then it can be said that teachers have not developed their potential and teachers have not developed and explored the potential of students to achieve curriculum goals. From the analysis carried out by looking at the teacher's lesson plan, where the lesson plan is the teacher's clothing in teaching, the teacher's clothing in conducting teaching and learning activities in the classroom or outside the classroom. Researchers analyzed the lesson plans used by fifth grade teachers at SDN 18, SDN 24 and SDN 30 Payakumbuh. In general, learning is only in class and has not utilized school facilities, one of which is seen from the learning

objectives, knowing geometric nets and making geometric nets. Here, IT can be utilized, in addition to utilizing objects around. From the observations of researchers when students study, students observe the teacher a lot, and listen to the teacher. Not seen the activeness of students in learning. In addition, the results of interviews with students in general students feel bored with learning mathematics and learning mathematics that they do not understand. They get imperfect scores in mathematics. In addition, their daily tests are also low in mathematics. They want math learning to be fun, math learning that engages them in IT.

The urgency of this research is to boost elementary school kids' motivation to learn mathematics. A precise science that greatly enhances students' life is mathematics. Because mathematics unifies all scientific disciplines and has a direct impact on students' daily lives, it is frequently referred to as the "queen of education." Students' enthusiasm to learn mathematics itself serves as the foundation for their mathematical learning. Mathematics lectures won't be able to benefit students if there is poor student motivation. Students may enjoy math classes if they are taught in a creative, novel, and enjoyable way. Such education can boost students' motivation for learning, which will lead to better learning results. The students' lack of good learning motivation was evident at the time of observation. They would rather remain silent than talk and share what they know. They appear uninterested while learning as well.

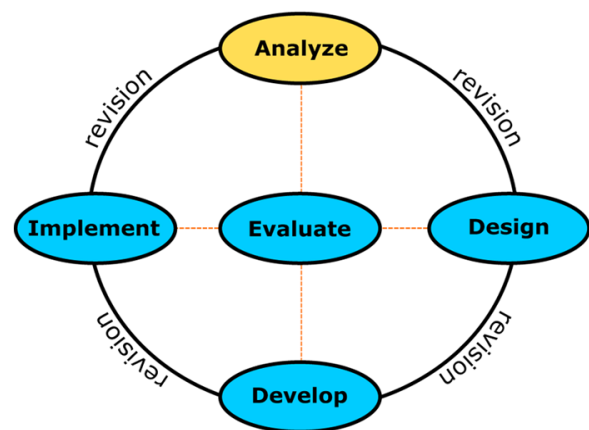
From the description above, it is necessary to carry out learning innovations by using learning media that utilize technological developments. Learning media in this study were developed with the help of applications *Articulate Storyline* which is expected to increase student motivation. *Articulate Storyline* program according to (Herman & Ahmad, 2021) can be used to create interactive learning media. Through computer-based interactive learning has more value, compared to ordinary printed learning materials. The use of media that is carried out online using *Articulate Storyline* also makes it possible to provide experiences to students, both visual and audio. With audio and visual media, it can involve the two senses of students, namely the eyes and ears to capture the material conveyed through the media. Development using *Articulate Storyline* has previously been used by (Kumbara & Rodliyah, 2021) with the research title *Developing Interactive Media Based on Articulate Storyline in Thematic Learning for Class V Elementary School Students* with the results of interactive media based on articulate storylines which are also practically applied to students. Because the results of student

responses that have been developed are valid and practical to use, interactive media based on articulate storylines can be applied in schools to assist teachers in conveying the content of the material being taught.

The articulate storyline program can also be used in distance learning systems so that it can be used for independent learning anywhere and anytime. The articulate storyline application is in accordance with the characteristics of today's students who like something new to foster students' learning motivation (Hadza et al., 2020). The articulate storyline learning media is also a medium that can attract students' attention and can stimulate students to learn with pleasure and enthusiasm (Sari & Harjono, 2021). Interactive media are often developed to facilitate the delivery of material or knowledge to students. The media is arranged in a concise but clear manner in the delivery of material according to learning outcomes (Saskia et al., 2022). Thus it can be concluded that the purpose of this research is to develop articulate storyline-based learning media that is used to increase elementary school students' learning motivation in learning Mathematics.

**Method**

Study This use research methods development (Research and Development or R&D). Research and Development is research methods used For produce certain product And test the effectiveness of the product (Tersiana, 2018). Development research at education field is a that type of research aim to produce products For educational / learning interests (Sugiyono, 2017). Research using model study Which adapted from development models ADDIE. This model uses 5 stages that is analysis stage, *Design, Development, Implementation, and Evaluation*. The following is the procedure for implementing the ADDIE development model.



**Figure 1.** ADDIE Development Model

The product that will be developed is expected to become a media learning right and make students understand more material learning. Therefore, wrong One method taken by researchers is through media-oriented "product-oriented development". learning by using *Articulate Storyline* For students of class V semester 2. Research this is done in 3 schools namely SDN 18, SDN 24 and SDN 30 Payakumbuh City. province Sumatra West. Study This held on month May-June 2023. Data collection is carried out through product validation, interviews, observation, distribution of questionnaires, and documentation. Data analysis in this study is an analysis of product validity, product practicality and product effectiveness.

## Result and Discussion

The results of this study are described in each step of the ADDIE development model as follows:

### *Analyze Stage*

Analysis stage conducted by researchers to collect data required in media development learning with *Articulate Storylines*. On analysis stage this is a researcher analyze several things between other: Determine the school that will be the place to develop the product. Researchers determined 3 schools namely SDN 18, SDN 24 and SDN 30 Payakumbuh City. Researchers chose these 3 schools because of the strategic location of the school, the teachers at the school also accepted the research plan well. There are many students in the school and can be invited to work together. As well as the absence of development research in the school.

Analysis of articles related to the development of learning media with *Articulate Storylines* in SD. The results of the analysis obtained 3 studies that are similar to the research that will be developed, namely they both develop learning media with *Articulate Storylines* in elementary schools. With variables, materials and classes that are different from this study.

Curriculum analysis, curriculum analysis is carried out in order to determine the curriculum used in schools that will be used as research sites. This analysis is important to do in order to know the curriculum used. After doing the analysis, the curriculum used by the 3 schools is the 2013 curriculum (K13). Not only analyzing the curriculum, researchers also have to analyze the KD mapping used by mathematics teachers in each school. for KI and KD mathematics to 3 schools are guided by Permendikbud No 37 of 2018 as is generally used by all schools and has become a provision from the education office. Besides that, research also conducts an analysis of teacher lesson plans, where lesson plans are used as

teacher clothing in teaching, teacher clothing in carrying out teaching and learning activities in class or outside the classroom. Researchers analysed the lesson plans used by fifth grade teachers at SDN 18, SDN 24 and SDN 30 Payakumbuh. In general, learning is only in class and has not utilized school facilities. besides that based on the times, teachers in lesson plans have not used IT media in learning media. Whereas in this day and age, 79% of students are fluent in using IT. For this reason, it is necessary to develop media in the school.

Analysis of the needs of teachers and students for learning media. To carry out this analysis the researcher used a questionnaire. One of the items for media needs is that learning using media is more fun than just using the lecture method, I am more able to follow the lesson well about what the teacher explains when using the media compared to just lecturing, and I feel bored quickly when taking notes only. and just listen without direct interaction. In general, students and teachers gave statements of agreement on the questions in the questionnaire. For this reason, the conclusion of the researcher is that there is a need for media development in the school.

Analysis of the character of students. Characteristics of students is the process of studying individual characteristics of students who can influence lessons and teaching in the classroom. Factors that need to be considered to analyse the characteristics of students is the personality of students. Each individual has a unique personality that can influence the way they learn and interact with their surroundings. For example, some students may be more introverted or extroverted than others, which can influence their learning style. Furthermore, because of learning can also be seen in this case. For example, learning styles in the average class use audio, or visual or audio-visual. Judging from the characteristic analysis, 80% of students use audio-visual learning styles. For that we need the right media that can activate their hearing and sight. For this reason, the solution that research offers is media development using *articulate storylines*.

Analysis of the availability of facilities and infrastructure. After the previous analysis was carried out, the last analysis of facilities and infrastructure was carried out to see the process of evaluating the availability of facilities and infrastructure carried out to support teaching and learning activities in the school or educational institution environment. What is necessary in this analysis is the availability of comfortable classrooms. On SDN 18, SDN 24 and SDN 30 in Payakumbuh have comfortable classrooms. In addition to classrooms, there is an adequate library with a collection of books according to the level of education. Availability of technological facilities such as in focus.

By looking at the learning styles of audio-visual students, researchers want to develop learning media by utilizing this in focus technology. In addition, an easy-to-access internet network and sufficient computers will make it easier for teachers to use media in learning.

Data Which collected as Teacher's lesson plans, mid-student report scores. Results of teacher and student interviews, and observations of facilities and infrastructure in schools.

### Stage Design

The process of designing learning using Articulate Storyline media are the teacher understands the important points of the learning material that will be delivered with the principle of a short, easy to understand, and interesting presentation, the limitations of the monitor screen, the selection of the Times New Roman font, setting uppercase and lowercase letters as needed, templates, bullets, backgrounds, colors, graphs and charts, animations, sounds, images (pictures, clip art, photos), the information presented does not exceed 95% of the slide area. The result of this design is expected later produce a process learning fun. Next, arrangement sheet instrument validation for rate video quality learning by material expert and media experts and student.

### Stage Development

After stage planning then the researcher the next step namely stage development. In development stage exists 3 activities as follows:

#### Making product

The product manufacturing stage starts with preparing to analyze KD, formulating indicators and formulating learning objectives. Next, choose important material, namely addition and subtraction of fractions, multiplication and division of fractions, comparisons and scales. Next do the preparation to make *Articulate Storyline*. Before making a learning design that must be prepared first is the learning device as mentioned above and the material that will be presented. Program *Articulate Storyline* and other supports such as pictures, videos, music and so on.

#### Validation

In validation there is material expert validation and expert validation media. As for This validation is distinguished be two that is:

Expert validation material is precondition before in trials on user. The trial was at SDN 02 Payakumbuh City and had obtained permission from the class teacher and school principal for the media trial. Media learning with *Articulate Storyline* Which developed will validated by experts material.

Validation media experts are validation which is conducted by the lecturer expert in instructional Media. Expert the media will judge appearance and aspects existing programs on learning media with *Articulate Storyline*. For validation of material experts and media experts. The questionnaire instrument submitted is an instrument that has been validated by the instrument validator. The plan at this stage includes: making the instrument first, the media being developed is tested and assessed through a material and media validation questionnaire, revising the product and consulting with the validator to get suggestions for improvement, the researcher meets the media validator and material validator to show the results of the product revision and material and after the product and material are declared valid, the researcher proceeds to the next research stage. The following are the validation results obtained from the validators.

**Table 1.** Product Validity Test Results

Expert validator	Percentage Value (%)
Media validators	82
Language Validators	100
Construct validator	95
Material validators	87
Amount	364
Average	91
Mark	Very Valid

From the explanation of the table 1, it can be concluded that from the results of the media validation it gets a value of 82%, from the discussion experts get a value of 100%, from the validation of construct experts it gets a value of 95% and from the results of the material validator it gets a value of 87%. So that the results are 91% and with the description "very valid" and this product is feasible for trials.

#### The feasibility of using learning media *Articulate Storyline*.

The feasibility of learning media can be concluded through the validation stage by experts, teachers and students. The validators chosen by the researcher consisted of one design expert lecturer, one material expert class teacher, and one fifth grade teacher, and students. The data collection instrument uses a media feasibility questionnaire which will be assessed using a Likert Scale. Following are the results of the feasibility test that has been carried out.

**Table 2.** Product Feasibility Test Results

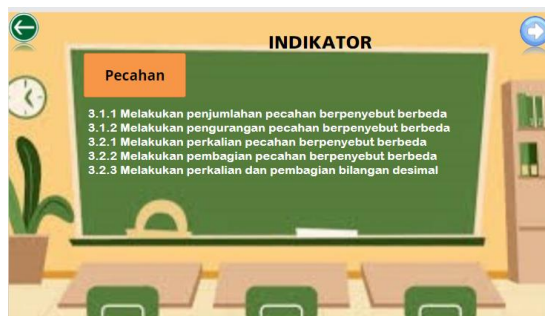
Subject	Percentage Value (%)
Teacher	93
Student	84
Average	88.5
Mark	Very Worth it

Based on the table 2, it is known that the average value of the feasibility test for learning media products is 88.5% which is included in the very feasible category. Thus the learning media is based on Articulate Storylinesuitable for use in fifth grade elementary school mathematics learning.

*Revise Products*

Product revision is carried out with the first several stages, namely with a preliminary study analyzing the lesson plan used by the teacher, the researcher determines what product is suitable for creating a conducive learning atmosphere and using IT media in learning. Again, the researchers analyzed the lesson plans and the needs of teachers and students. Peliti got advice from the teacher, namely that in the media students should be seen being evaluated and giving grades like quizzes. In addition, students in using the media are also easy and practical. According to students, they also need learning that activates their audio and their visuals. From this analysis the researcher provides a solution using Articulate Storyline media because in Articulate Storyline based media it is similar to power point media but this media is not only for presentations, but also requires students to be active in using media. digest the information in the media and observe the videos and focus on working on quiz questions.

Next, media will be loaded based on Articulate Storyline with guidelines on KI, KD from curriculum 13. After making the product, the product will be validated by media experts from UNP media expert lecturers and will also be validated by teachers who will use the media. after obtaining the validation results, the validation results will get input and suggestions for the media. Then the researcher will revise according to suggestions and input from experts and also teachers. After validation, it will be shown again to the teacher the results of the media revision according to the teacher's suggestions and input. Then if it is correct, it will be tested at SDN 2 Payakumbuh City. Here are some revised product images.



**Figure 1.** Product after revision



**Figure 2.** Learning Materials in After Revision Products

*Implementation Stage*

This implementation stage is the stage using the articulate storyline product was carried out in 3 schools, namely at SDN 18, 24 and 30 Payakumbuh. Every student uses articulate storyline media for learning. After using the articulate storyline media the students were given a motivational questionnaire. From the use of learning media using an articulate storyline, the percentage of students' scores was obtained by answering the motivational questionnaire as follows:

**Table 3.** Student Response Results Through the Learning Motivation Questionnaire

Name	Total score	Average (%)	Criteria
SDN 18 Payakumbuh	90	8.11	Very high Motivation
SDN 24 Payakumbuh	93	8.38	Very high Motivation
SDN 30 Payakumbuh	91	8.20	Very high Motivation
Amount	274	91.33	Very high Motivation

Based on the table 3, it shows that the distribution of the trial questionnaire data product field trail students' learning motivation in grade V after using articulate storyline media in learning mathematics students obtained at SDN 18 Payakumbuh, got a result of 91.% in the very high motivation category, at SDN 24 Payakumbuh, got a result of 8.38% with the motivation category very high and at SDN 30 Payakumbuh, got a result of 8.20% with very high motivation category. Distributed from field trials in the 3 schools, the results were 91.33% in the "very high motivation" category. From the test results product shows that learning media using articulate storylines can increase students' learning motivation.

## Conclusion

The development of learning media using the articulate storyline program has succeeded in developing a product or learning media that can increase the learning motivation of fifth grade elementary school students that is valid, practical and effective. The results of media validation get a value of 82%, from the validation of language experts get a value of 100%, from the validation of construct experts get a value of 95% and from the results of the material validator get a value of 87%. So that the results are 91% and with the description "very valid" and this product is feasible for trials. The average value of the feasibility test for learning media products is 88.5% which is included in the very feasible category. Distributed from field trials in the 3 schools the results were 91%.

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## Author Contribution

The contribution of this research belongs to the collaboration between college student and edvisers. The corresponding author is a college student and the other is the writer's edvisers who has directed and guided the writing of this research to completion.

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## Conflicts of Interest

This research did not have a conflict during the completion of writing this research. All parties can work together very well.

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