Development of *Articulate Storyline*-based Dynamic Fluid Learning Media For Grade XI High School Students

Farah Faridatul Fatikhah*, Mita Anggaryani
Jurusan Fisika, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Surabaya
*Email: farah.17030184098@mhs.unesa.ac.id

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ABSTRACT

Articulate Storyline (AS) is a learning media creation software that presents materials with storylines. The presence of added characters makes the learning media more interactive and more immersed in the story presented. The use of characters is expected to appeal to students learning. The purpose of this research is to design a physics learning medium that implements Dynamic Fluid theories into a storyline using *an Articulate Storyline*. According to contextual learning theory, good learning is learning that is applicable to daily life. The topic used in the learning media developed is Dynamic Fluid. For further media development, researchers plan to raise the life of a plumber and associate it with Dynamic Fluid materials according to the High School Curriculum. The method used in this study is *Research and Development (R&D)*. Media can be used via web and android. This study stated that the learning media developed is worth using with a validity value of 90.71% classified as very valid. The positive response of students to the media by 99.16%, which belongs to the category, is very good. The percentage of learning activities completed through the comprehension test was 84.4%, which falls into the category of very good.

Key words: *Articulate Storyline*; Dynamic Fluid; Learning Media; Android.

INTRODUCTION

The use of learning media in the learning process can generate new desires and interests, generate motivation and stimulation in learning activities. In addition, the delivery time of the material becomes faster because the media can help the teacher visualize the material and reduce verbalism in the classroom, so that the teacher does not have to explain over and over again when students have difficulty understanding the material (Arsyad, 2011).

In the era of globalization, the development of technology is increasingly sophisticated. The world of education is not separated to make adjustments to improving the quality of education. The use of computer-based media is one of the uses of technology in the field of education. Computer-based media can support the presentation of materials and as a learning resource.

In line with the objectives of Permendiknas No.16 the Year 2007 on Academic Qualification Standards and Teacher Competencies, as an educator, teachers are required to follow the development of technology in education by making breakthroughs in utilizing Information and Communication Technology (ICT) in learning in schools. One of them is by using the computer as a learning medium in an interactive form.

One example of interactive media is the Articulate Storyline. Articulate Storyline is one of the supporting software for the implementation of integrated learning media that has a variety of learning support features that can be used easily (Deni, 2011).

Features that can be used in articulate storyline media are quizzes, conversations, discussions, and learning material inputs in various formats.

The fluid matter is material with objects that exist in the real world, but objects in fluid material are difficult to present directly in the classroom. Therefore, a learning medium is needed that can present the object.

Articulate Storyline-based Learning Media with dynamic fluid topics is expected to be a supporting learning media that can attract students. Physics is a science that studies the symptoms of objects in nature. Physics is the study of an object's or event's physics properties, such as shape, magnitude, and weight, and how they interact with one another (Zaman, et al. 2012).

Physics includes many physics concepts that students theoretically elusively understand. Therefore, understanding concepts is a requirement in achieving the success of learning physics. Physics is not only memorizing formulas, understanding, and concept applications are also required.

The use of interactive learning media is proven to help teachers as a tool to deliver materials in the learning process. As revealed by Maharani (2015) in the Indonesian Journal of Curriculum and Educational Technology Studies, the implementation of learning activities increasingly demands the use of varied learning media. The learning process is an internal process from within the human being. Thus, teachers are not the only learning resource for students but are one part of the learning resources. This makes learning media important.

Articulate Storyline is software that was introduced in 2001. An articulate Storyline is used in presenting information for a specific purpose. The advantage of this software is that it can create presentations that contain technical capabilities and art capabilities. Based on the collaboration, these two capabilities can create interesting presentations. So that makes the presentation more enjoyable.

Articulate Storyline is present as easy and fun interactive learning media creation software. Its simple appearance, similar to *Microsoft PowerPoint*, allows ordinary teachers to create interactive learning media, which is easier because it doesn't require a programming language, and many of the tools in *Articulate Storyline* are similar to *Microsoft PowerPoint.*

Winkel (1996) suggests learning is a mental or psychic activity that occurs in direct interaction with the environment, which results in changes in knowledge, skills, attitudes, and values. The changes are relatively constant and scarred. This learning activity can occur when encouraged by motivation. Hamdu research (2011) showed that student learning motivation influenced 48.1% of students' learning achievement. According to the findings of a study conducted by Yasa (2013), students with high learning motivation are more likely to stick with the learning process because they believe learning is important, whereas students with low learning motivation appear dispassionate, making it difficult for them to understand concepts and making the learning process ineffective. Based on Hesta et al Research (2018) Articulate Storyline can increase students' learning motivation with a high percentage of 82.1%.

Articulate Storyline's advantage over other media is that it looks similar to PowerPoint, making it easy for new users to use it. Slide templates are available with a lot of options, but we can create our templates as we like. (2) The characters and templates available are quite numerous and interesting so that the media created will look more interesting and is expected to increase students' learning interest. (3) High Interactivity. Many interactive features are available, such as *Quizzes and assessments, Screen Recordings, Slide Layers, Triggers characters.* (4) The format of the final result may vary.

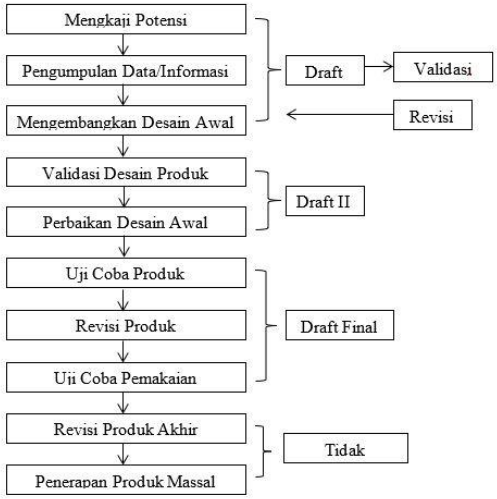
The learning media that will be developed is created with several other programs, including *Articulate Storyline, Canva, Corel Draw X4*, and *Microsoft Word 2007.*

Based on the above exposure, researchers want to present Fluids in learning activities without the need to bring Fluids into the classroom. In addition, researchers want to pour the concepts of Dynamic Fluid into a storyline in this case the author raised the story of a plumber who is at work.

RESEARCH METHOD

This research used *Research and Development (R&D)* method. The stages of Research and Development are, reviewing potential problems, data/information collection to develop research designs, developing product initial designs, product validation, initial design revisions, product trials, product revisions, usage trials, final product revisions, and mass product

implementation (Sugiyono,2016).



Picture 1. *Research and Development (R&D)* research design stage (Sugiyono, 2016)

This research is only conducted until the trial of limited use of the product followed by evaluation. Media trials were conducted on 20 high school-grade XI students. The target of the study was taken randomly through social media. The research was conducted on April 14-April 16, 2021.

The initial stage of research is conducted a review of data and information to then be done initial design. The assessment of information on Articulate Storyline is reviewed through literature studies and by field studies. Field studies were conducted with interviews to teach media experts who have mastered *Articulate Storyline.*

The feasibility of this learning media is reviewed from the validity aspect that will be studied by lecturers of learning media experts and fluid material experts. The feasibility of the validity of this learning media is reviewed from the visual aspects, content, and character of the learning media. Visual aspect criteria include image quality, color quality, clarity of writing.

Aspects of content include language, sentences, clarity of storyline, and material. Characteristic aspects include design, critical thinking. The criteria contained in each aspect are assessed and analyzed based on validation results through the validation sheet. This media can be said to be worthy as a learning medium if it has an average percentage of media validation assessment reaches ≥70% (Riduwan, 2013).

Analysis techniques used to assess the feasibility of *Articulate Storyline*-based Dynamic Fluid media using *Likert scales.*

Table 1. Media Validation Assessment Likert Scale

Score	Criteria
4	Excellent
3	Good
2	Less
1	Bad

The standard used in determining the validity of Yajni media can be said to be feasible if the value of each aspect of validation ≥70% (Riduwan, 2013). The validation result which is the next score is calculated using the following equation:

$$\text{Confidence of each aspect of the assessment} = \frac{\sum \text{Score each aspect obtained}}{\sum \text{Score maksimal tiap aspek}} \text{x}100\%$$

The results of the equation above are then analyzed based on the following table:

Table 2. Percentage of Assessment Aspects

Feasibility of Each Aspect of Assessment	Criteria
25%-39%	Not Worth It
40%-54%	Less Worthy
55%-69%	Decent Enough
70%-84%	Worth
85%-100%	Very Decent

RESULTS and DISCUSION

Research begins with conducting literature studies and field studies. Literature studies are conducted by looking for Library references on Dynamic Fluid material as well as literature on the operation or workings of Articulate Storyline. Field studies are conducted with online interviews with learning media experts.

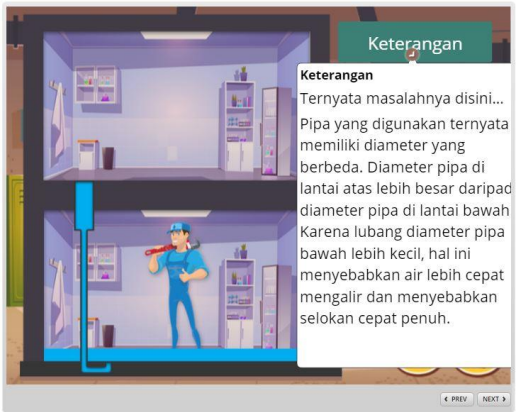
The next stage of the researchers is drafting materials, dubbing script character selection, storyboarding, the storyline as well as the initial design of media design. Voice dubbing

was done by researchers using *Voice Changer*. Here's a look at the media you've created.

Picture 2. Early View of *Articulate Storyline*-based Dynamic Fluid Learning Media.

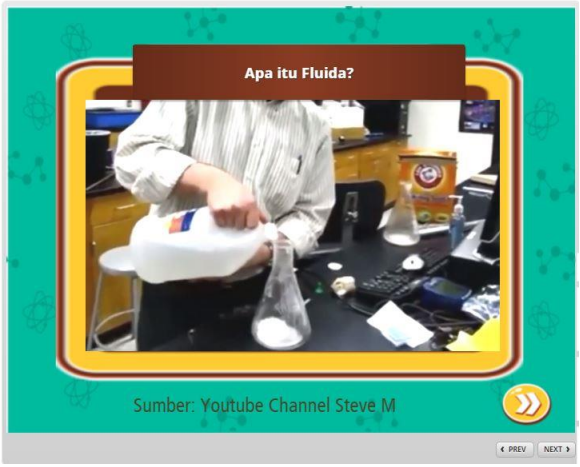
Picture 3. *Articulate Storyline*-based Dynamic Fluid Learning Media Menu View.

Due to the theme used by Dynamic Fluids, researchers chose a plumber (Mr. Plumb) as the main character. In addition, researchers also linked the concepts of Dynamic Fluids into the work of plumbers as shown below.



Picture 4. Application of Dynamic Fluid Concept into Plumber's Work Story *(Mr. Plumb)*

The created media also presents test videos related to Dynamic Fluid material.



Picture 5. Video of Experiment Fluids Flow

Picture 6. Exercises

Picture 7. Problem Discussion

The media provided 15 questions of understanding test about the concept that has been presented, it is intended to test students' understanding after using Dynamic Fluid media based on *Articulate Storyline*. After work, students can instantly know the score they are getting. In addition, there is also an answer to the justification at the end.

The learning media that has been made is then validated by two lecturers of Physics, State University of Surabaya. Here is a table of data validation results of learning media that have been done.

Tabel 3. Likert Scale For Validation Results

Score	Criteria
4	Excellent
3	Good
2	Less
1	Bad

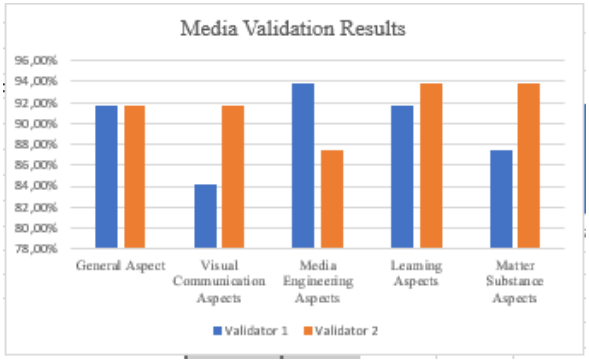
Table 4. Media Validation Results

No.	Assessment Aspects	Validator's score		Percentage and Criteria
		1	2	
A.	**Media**			
1	**General Aspects**			
	a. Creative and innovative (new, flexible, interesting, intelligent, unique, and No different origins)	4	4	100% (Very Valid)
	b. Communicative (easy to understand and use good, correct, and effective language)	4	4	100% (Very valid)
	c. Superior (has advantages over other multimedia learning or in conventional ways)	3	3	75% (Valid)
	Average	91,6%	91,6%	
2	**Aspects of Visual Communication**			
	a. Communicative: Visual and audio elements support teaching materials, so that they are easily digested by students.	4	4	100% (Very valid)
	b. Creative: Visualizations are expected to be presented uniquely and Not clichéd (often used), in order to attract attention.	4	4	100% (Very valid)
	c. Simple: Visualization is Not complicated, so as Not to reduce the clarity of the content of the teaching material to be easy to remember.	4	4	100% (Very valid)
	d. Unity: Using visual and audio language that is harmonious, intact, and similar so that the teaching materials are perceived as whole (comprehensive).	4	4	100% (Very valid)
	e. Depiction of objects in the form of images (images) both realistic and symbolic.	3	4	87,5% (Very valid)
	f. Selection of appropriate colors, in order to support the conformity between creative concepts and selected topics.	3	4	87,5% (Very valid)
	g. Typography (fonts and arrangements), to visualize verbal language to support message content, both readability and psychological functions.	3	4	87,5% (Very valid)
	h. (layout): The placement and arrangement of visual elements is well controlled, in order to clarify the role and hierarchy of each of these	3	3	75% (Valid)

	elements. i. Moving visual elements (animations and/or movies), animations can be used to simulate teaching materials and movies to illustrate materials.	3	3	75% (Valid)
	j. Familiar and consistent navigation to be effective in its use	3	4	87,5% (Very valid)
	k. Audio elements (dialogue, monologue, narration, illustration, music and sound/special effect) correspond to the character of the topic and can be used to enrich the imagination.	3	4	87,5% (Very valid)
	Average	84,09%	91,67%	
	Aspects of Media Engineering			
	a. Creativity and innovation in the development and use of learning media	4	3	87,5% (Very valid)
	b. Maintainable (can be operated easily)	4	4	100% (Very valid)
	c. Usability (easy to use and simple to operate)	3	4	87,5% (Very valid)
	d. Accuracy of application type selection/software/ Tools for development.	4	4	100% (Very valid)
	e. Compatibility (learning media can be installed and run across a variety of existing hardware and software)	4	3	87,5% (Very valid)
	f. Packaging of learning media programs in an integrated and easy execution.	4	3	87,5% (Very valid)
	g. Complete multimedia learning documentation includes: installation instructions (clear, short, and complete), program design (clear, and describing workflow program).	3	3	75% (Valid)
	h. Rehabilitation (Some or all learning media can be reused to develop other media).	4	4	100% (Very valid)
	Average	93,75%	87,5%	
	B. Material			
1	**Learning Aspects**			
	a. Relevance of learning objectives to curriculum/SK/KD.	4	4	100% (Very valid)
	b. Scope and depth of learning objectives.	4	4	100% (Very valid)
	c. Accuracy of the use of learning strategies.	4	4	100% (Very valid)
	d. Interactivity	4	4	100% (Very valid)
	e. Contextually	4	3	87,5% (Very valid)
	f. Completeness and quality of learning aid materials	3	4	87,5% (Very valid)
	g. Easy to understand	3	4	87,5% (Very valid)
	h. Logical and clear systematics.	3	4	87,5% (Very valid)
	i. Clarity of descriptions, discussions, and examples	3	4	87,5% (Very valid)
	j. Consistency of evaluation with learning objectives	4	3	87,5% (Very valid)
	k. Relevance and consistency of	4	4	100% (Very

	evaluation tools l. Providing feedback on evaluation results	4	3	valid) 87,5% (Very valid)
Average		91,67%	93,75%	
2	**Aspects of Material Substance** a. Material truth in theory and concept b. Accuracy of the use of terms in accordance with the field of science c. Depth of material d. Actuality	3 4 3 4	4 4 3 4	87,5% (Very valid) 100% (Very valid) 75% (Very valid) 100% (Very valid)
Average		87,5%	93,75%	
Average Overall		90,71 % (Very valid)		

Based on Table 4, the assessment result by Validator 1 obtained an average validation result of 87.50 %. For the second validator, validation assessment results with an average of 93.75%. The total value of the second assessment of validators was obtained with an average of 90.71% so that based on the Likert scale of Dynamic Fluid learning media based on *Articulate Storyline* is classified as a very valid category.



Picture 7. Media Validity Graphic

In Graph Figure 7, the assessment of validation results on common aspects is obtained with an average value of 91.67% classified as in the very valid category. Furthermore, in the aspect of visual communication media obtained an average value of 87.88% classified in the category of very valid.

Then for the aspect of media engineering was obtained with an average value of 90.63% classified in the category of very valid. The fourth aspect is that the learning aspect obtains an average score of 92.71% classified in the very valid category. And for the last aspect that is, the substance aspect of the material gets an average value of 90.63% classified in the very valid category.

These five aspects have been averaged and obtained validity results with a value of 90.71% which shows that the learning media of Articulate Storyline-based Dynamic Fluid is very worthy to be tested. It can be said that it is feasible to have a value of ≥ 61% with valid and very valid criteria (Riduwan, 2013).

Both validators are two lecturers at The State University of Surabaya with different skills, validator 1 is an expert lecturer in the field of learning media development while validator 2 is a lecturer in materials, especially Fluid.

Media that has been declared valid and eligible for use is then tested using the *One Shot-case* study experimental design trial. At the end of *articulate storyline*-based Dynamic Fluid media, there is an understanding test in the form of a 15-point problem exercise.

Because the current condition of the world is being hit by the Covid-19 outbreak and the government issued a policy for PSBB (Large-Scale Social Restrictions), the trial activities can't be conducted face-to-face. Therefore, the trial was conducted online, researchers took samples randomly through social media. The trial was conducted on 20 grade XI students. The selection of respondents is done through social media. Researchers spread the broadcast on Twitter, Whatsapp as well as a telegram. Once obtained respondents who meet the criteria and willing, respondents are given a link to try a dynamic fluid media based *Articulate Storyline.*

After trying *to Articulate Storyline* based Dynamic Fluid media students fill out a poll related to the media that has been used. The following are the results of the analysis of the questionnaire response to students.

Table 5. *Articulate Storyline* Based Media Usage Response Results.

No.	Questions	Percentage

		(%)	
		Yes	**No**
1	I'm from easy media easy media articulation Fluid Dynamics based *Articulation Storyline*	100	
2	Applications Used to be able to track dynamic fluid learning is very accessible.	100	
3	Illustrations and images in this *Articulate Storyline*-based Physics teaching medium help me understand the concept of Dynamic Fluid matter.	100	
4	Articulate Storyline-based Dynamic Fluid learning media is interesting to me.	100	
5	The story presented in the learning medium of Articulate Storyline-based Dynamic Fluid is in accordance with daily life.	100	
6	In my opinion, the storyline presented represents the events that correspond to daily life so as to help me to understand the concept of Dynamic Fluid material.	100	
7	Explanation of description, audio, and video That add in the learning media Dynamic Fluid is petrified I understand the Concept of Dynamic Fluids	95	5
8	In my opinion, the learning media of Articulate Storyline-based Dynamic Fluid is in accordance with the development of technology At this time.	100	
9	This Articulate Storyline-based Dynamic Fluid learning medium evokes the motivation of learning Physics for me.	95	5
10	This Articulate Storyline-based Dynamic Fluid learning medium helps me to learn more interactively.	100	
11	In my opinion, this Articulate Storyline-based Dynamic Fluid learning medium is in accordance with the material you want to convey	100	
12	This Articulate Storyline-based Dynamic Fluid learning medium fosters curiosity for Me.	100	
Average		99,16 %	0,83%

In Table 5, it can be seen that the positive response of students is 99.16% which belongs to the category that is very worth it. Articulate Storyline-based Dynamic Fluid Media gets a good response from students. Students get a new experience of learning Dynamic Fluids with your story presented.

Table 6. Percentage of Student Positive Responses

Percentage of Each Aspect	Criteria
25%-39%	Not Worth It
40%-54%	Less Worthy
55%-69%	Decent Enough
70%-84%	Worth
85%-100%	Very Decent

The standard used in determining student response feasibility media can be said worth if the value of each aspect of the student's positive response ≥70% (Riduwan, 2013). Furthermore, in this study obtained an understanding test. The following results are obtained from the comprehension test:

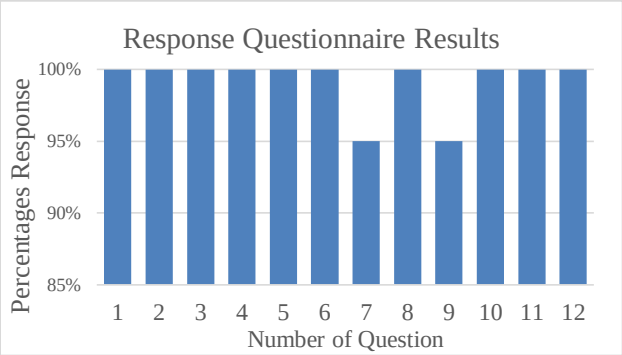
Table 7. Student Comprehension Score Results

Respondent	Score	Description
1	79,16	Complete
2	72,22	Uncomplete
3	95,13	Complete
4	86,11	Complete
5	100	Complete
6	95,13	Complete
7	100	Complete
8	72,22	Uncomplete
9	79,16	Complete
10	74,30	Complete
11	88,19	Complete
12	81,25	Complete
13	93,05	Complete
14	86,11	Complete
15	79,16	Complete
16	100	Complete

17	93,05	Complete
18	86,11	Complete
19	62,50	Uncomplete
20	69,44	Uncomplete
% Completion		84,4%

Table 8. Percentage of Student Positive Responses

Percentage of Each Aspect	Criteria
25%-39%	No Worth
40%-54%	Less Worthy
55%-69%	Decent Enough
70%-84%	Worth
85%-100%	Very Decent



Picture 8. Response Questionnaire Results

In the figure 8 chart, the average completion percentage value of 84.4% belongs to the very good category. There are 18 students declared complete with a score of ≥ 75 and 4 students declared not completed with a score of ≤ 75. These results show that the learning activities take place to the maximum.

CONCLUSION

Based on the results of research, it can be concluded that developed Dynamic Fluid media-based Articulate Storyline developed worth to be used as a learning media for students. This can be reviewed from the results of learning media validity get a value of 90.70% with a very valid category, which means its so worth to be tested. Furthermore, it can be seen from the positive responses of students to the learning media of Articulate Storyline-based Dynamic Fluids by 99.16%. Based on the comprehension test that has been conducted at the end of the learning activities, 16 students achieved completion of learning, and 4 students have not completed learning with a percentage of completion of 84.4%. There are suggestions to develop the voice of learning media, some students expect the voice that used with real voice to make the learning feel more real.

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