

The Development of Physics Animation Video assisted by Levidio Animatoon on Fluid Material

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Abstract: This study aims to develop a physics animation video assisted by Levidio animatoon on fluid material which is valid, effective and proper to use. Fluid material consists of dynamic fluid and static fluid. This research was conducted at SMA Wathaniyah Tanjung Lenggang and SMA Dharma Pancasila. The resulting product is an animated video which is applied to partners, SMA Wathaniyah Tanjung Lenggang. The study used Research and Development R&D method by Borg and Gall which was modified by Sugiyono. The stages carried out during the research are potential problems, collecting data, making media designs, validating material experts and final revisions. This type of research is a quantitative descriptive research. Findings: 1) the physics animation video assisted by levidio animatoon is valid 2) The level of effectiveness seen from the pretest and posttest scores of class X students who came from two schools, Dharma Pancasila Senior High School are 68,5 and 69.5, while Wathaniyah Senior High School are 46,4 and 63,21 3) Eligibility according to the responses from filling out the questionnaire: (a) Percentage of eligibility score of material experts 99 % (b) Percentage of feasibility score of media experts 86,5% (c) Percentage of responses from small groups, Wathaniyah Senior high school students as much as 86.6% (d) Response scores percentage of the large group test student reviewers came from two schools, Wathaniyah Senior High School 97,5 % and Dharma Pancasila Senior High School is 78,85 media experts, revising designs, testing products in small groups, revising again, testing products in large groups a%. That the physics animation video assisted by Levidio animatoon on fluid material that has been developed is valid and very suitable for use.

Keywords: Video animations, levidio animatoon dynamic fluid and static fluid.

Introduction

Technology becomes an important part for human life. Technology especially Information Technology has big impact for human to get information and knowledge. Technology information has a role to be learning media which arranged and developed for giving information and knowledge required for citizen (Pribadi, 2017). Information technology must be able to follow changing times. Nowadays world was shocked by the Corona Virus outbreak. In Indonesia many have died, it was recorded. The spread of the Corona virus in Indonesia has an impact in all fields, such as politics, economy, social and culture, defense and security, and other fields including education. Several provincial governments and all universities in Indonesia have taken steps temporarily to stop the learning process in schools as a form of anticipation for the spread of the corona outbreak, especially in the education area (Kompas.com). Learning, which usually takes place in class, has shifted to online learning. Online learning is learning that is done face-to-face, via an available platform. Online learning can be through e-learning and social media. Online learning uses e-learning which form of LMS (Learning Management System) such as schoology, google classroom, edmod, sevima and sipda which are LMS from Medan State University. Meanwhile, learning through social media such as Facebook, Twitter, Instagram, Zoom, Webex, telegram, e-mail and others. E-learning systems and applications are often referred to as LMS (Learning Management System), which is a software system that virtualizes conventional teaching and learning processes for administration, documentation, reports on training programs, classrooms and online events, e-learning programs, and training content (Ellis, 2009). The application of e-Learning in learning can be done with the LMS (Learning Management System) application. LMS is an application that contains features needed in the learning process and can make students and teachers enter the forum to discuss each other, take online quizzes and access learning materials anywhere and anytime as long as they are connected to the internet. LMS (Learning Management System) is also supported by various forms of media such as video, audio and images that can attract students' interest.

Online learning for LMS mostly uses google classroom, Schoology, and SIPDA. As for social media, many use WhatsApp. In an interview with one of the teachers of SMA Wathaniyah Tanjung Lenggang, learning was carried out by e-learning and using WhatsApp. Teachers send teaching materials and assignments every week. This causes boredom for students. So a learning media is needed in addition to teaching materials sent on e-learning and WhatsApp which can attract students to learn independently.

So based on the above problems, another media is needed, namely animated videos. Many researchers have made animated video media, but no one has made fluid material animation videos using the levidio animatoon. Video's ability to visualize material is very effective in helping educators deliver dynamic material. The idea of the video is a more flexible medium to support student learning activities, videos can also explain concepts, mechanisms or a process. (Hwang, et al., 2012; Lashari, et al., 2013; Soika, et al., 2010). Videos can attract students' attention in class, clarify ideas and explain concepts (Cardoso, et al., 2009).

In this study, the learning media developed was experimental media based on the scientific video approach on dynamic electricity material. The development model uses Research and Development (R & D) from Borg and Gall up to 8 stages. This experimental video is designed to make it easier for students to understand the material and increase student motivation to study independently.

Animation is one of the computer-based learning media which aims to maximize sound effects and provide continuous interaction, so that understanding of teaching materials increases (Luhulima. DA, 2013). Levidio Animatoon is a video template and power point graphics that are used to create various Explainer graphics and videos ranging from characters, backgrounds, banners to video templates. All elements such as images, videos, text, and audio can be added or edited to produce an attractive video. Levidio can be used on power point.

As a medium of knowledge, animation has the benefit of being able to expose something that is complicated to explain with just pictures and words. Animation can be used to explain the material that is not visible to the eye, by visualizing it, the material described can be described (Febriani. Y., Maritasari. D. B., 2015). There are various advantages of using animation in learning such as an interesting animation designed to make learning not boring and can motivate student learning. Animation can be packaged to convey various types of subject matter according to learning indicators, and the use of animation can reduce production costs compared to using real actors (Sari. S. L., et al, 2017).

The research objectives to be achieved in this study are: (1) Developing a physics animation video assisted by Levidio Animatoon on valid fluid material. (2) Developing a physics animation video assisted by levidio animatoon on effective fluid material. (3) Determining the feasibility of the physics animation video with the aid of Levidio Animatoon on fluid material.

Theoretical Review

Media comes from the Latin word medium which means "intermediary" (Pribadi, 2017). According to Azhar Arsyad (2013:3), media is the intermediary or delivery of messages from the sender to the recipient of the message. Videos add a new dimension to the learning of history. Because videos can present moving images and sounds to students. Videos ability to visualize material is very effective in helping educators convey dynamic material. Packaging of this video media combined with animation (Agustian. R., dkk, 2018).

Animation comes from the Latin "anima" which means soul, life, and spirit. While characters are people, animals and other real objects that are poured in the form of 2D and 3D images. Animation is an image that contains objects that seem to be alive (Satria. R.G., 2015). Utami (2011) animation is a series of images that form a movement. Animation is often interpreted as "animating" from an inanimate object or static object that can then create motion, or the impression of moving.

Research Methods

This study uses the Research and Development (R & D) method. The procedure used is 7 stages out of 10 stages of the Borg and Gall method modified by Sugiyono, namely Potentials and Problems, Collecting Data, Product Design, Design Validation, Design Revision, Product Testing, Product Revision (Sugiyono, 2012).

This research was conducted from May to November and was carried out by SMA Wathaniyah Tanjung Lenggang and SMA Dharma Pancasila. The populations in the study were all class XI students at SMA Dharma Pancasila and SMA Wathaniyah. The research samples were XI-1 SMA Dharma Pancasila and XI-1 SMA. Respondents of this study were students of small groups, large groups and physics teachers.

The instrument or data collection tool in this study was to use a questionnaire, observation and documentation. According to Creswell (2012), a questionnaire is a data collection technique in which participants / respondents fill out a statement or question, then after filling it completely it returns to the researcher (Sugiono, 2017). The data analysis technique was carried out using quantitative descriptive analysis techniques, namely by analyzing quantitative data in the form of numbers obtained from expert test questionnaires and field tests.

Table 1. The interpretation of score (percentage) validation sheet.

Percentage	Criteria
80,1% - 100%	very high
60,1% - 80%	high
40,1% - 60%	currently
20,1% - 40%	low
0,0% - 20%	very low

$$P = \frac{X}{X_i} \times 100\%$$

Information:

- P = Percentage each criteria
- X = Score each criteria
- X_i = Maximum score for each criteria

To test the effectiveness of animated video media, it is obtained in the following ways:

$$X = \frac{\text{The number of scores obtained}}{\text{The ideals numbers of scores}} \times 100\%$$

Table 2. Competent scale percentage

Gain Percentage	scale	Interpretation Scale
76% ≤ score ≤ 100%	4	Very Competent
51% ≤ score ≤ 75%	3	Competent
26% ≤ score ≤ 50%	2	Competent Enough
0% ≤ score ≤ 25%	1	Less Competent

Table 3. The effectively evaluation of media

Value	Criteria	Percentage
A	Very well	$80\% < X < 100\%$
B	Well	$60\% < X < 80\%$
C	Medium	$40\% < X < 60\%$
D	Not well	$20\% < X < 40\%$
E	Very not well	$0\% < X < 20\%$

Results and Discussions

This research produces a product, namely a physics animation video that is valid, effective and suitable for use.

Based on the development of the R&D development model, Borg and Gall, which is used in this study only up to seven stages, namely:

1. Potential and Problems, based on previous research, researchers found problems faced by teachers and students in online learning. Teachers must choose the right media for online learning in order to foster students' interest in participating in learning.
2. Data obtained from interviews with one of the physics teachers is the need for media that can attract students' interest to learn. Based on interviews with several students, it is better if the learning media is innovated, not only teaching materials are given.
3. Design products and edit videos using Levidio Animatoon software.
 - a. The opening part is the video title



- b. Fluid sub material is Static fluid



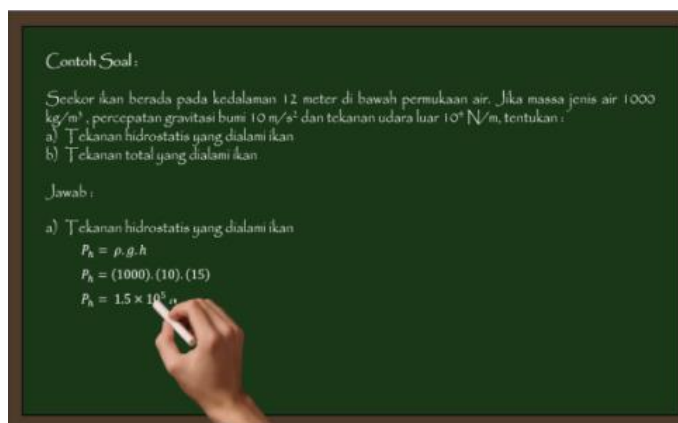
c. Describe the laws in the Dynamic Fluid material



d. Experiment with the material



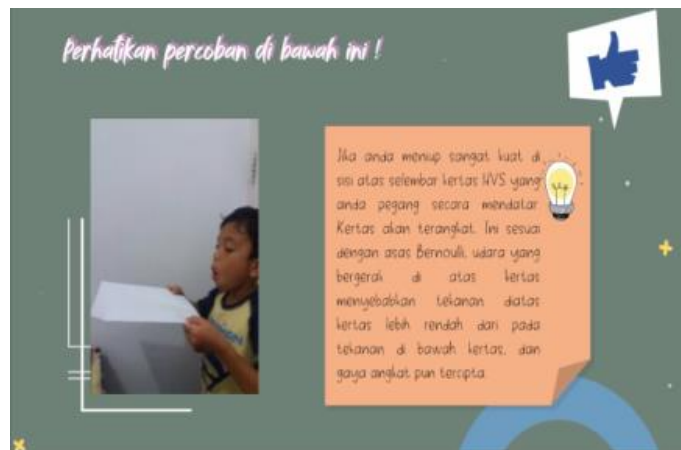
e. Example question from static fluid



f. The next fluid sub material is dynamic fluid



g. Conducting experiments regarding Bernoulli's Law



h. Example problems from Dynamic Fluid



- i. The application of Bernoulli's principle in everyday life



- j. Closing



After being designed, the resulting product is an animated video. The development of video animation products based on levidio animatoon was evaluated by material experts and media experts. The validation was carried out by two experts.

The results of the development of animated video instructional media assisted by Levidio animatoon obtained data, namely (1) evaluation data of material experts consisting of validation, input or revision data. (2) Evaluation data of media experts consisting of data from validation results, results of analysis and input or revisions. (3) Evaluation data of teacher reviewers are data from analysis and input. (4) Data on the evaluation of trial results in small group students, namely the results of analysis and input (5) Data for evaluation of the results of trials in large group students, namely the results of analysis and input.

Expert Review of Results

a. Material Expert

The material assessment questionnaire includes two aspects of quality and aspects of material usefulness. Overall the validation level of the Physics animation video with a score of 111 (99.11%). The calculation results are presented in the table below:

Table 4. For material expert

Num	Aspect	Frequency				Score	Items	Maksimum Value	Percentages
		1	2	3	4				
1	Material Quality	0	0	0	20	80	20	80	100.00%
2	Material Benefit	0	0	1	7	31	8	32	96.88%
Amount						111	28	112	99.11%

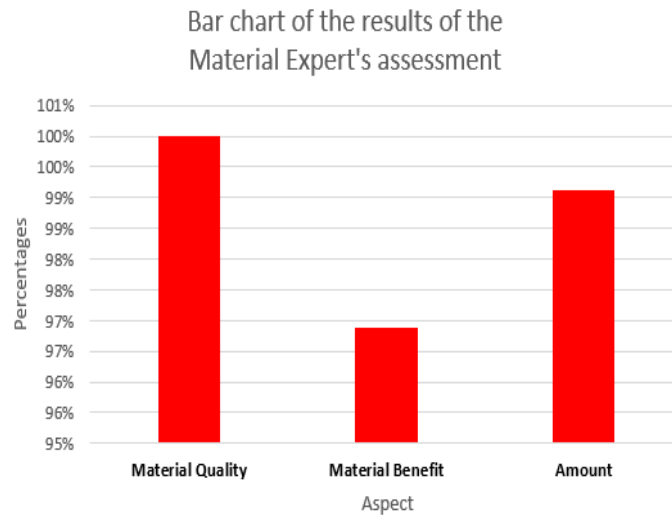


Figure 1. Bar chart of the results of the material expert's assessment

So this media is valid and very feasible to use.

b. Media Expert Overview

Overall, the level of material validation obtained a score of 103 (88.79%). Look at the table below:

Table 5. For media expert

Num	Aspect	Frequency				Score	Items	Maksimum Value	Percentages
		1	2	3	4				
1	Quality of Media	0	0	2	11	50	13	52	96.15%
2	Used of Language	0	0	4	2	20	6	24	83.33%
3	Layout of Media	0	0	7	3	33	10	40	83%
Amount						103	29	116	88.79%

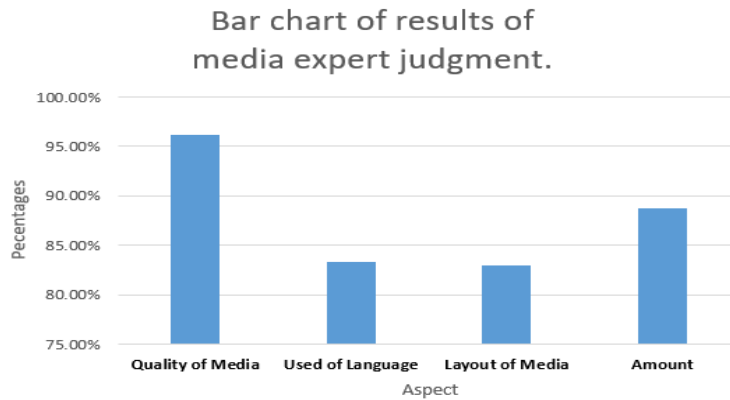


Figure 2. Bar chart of results of media expert judgment.

Thus the animated video media is very feasible. Based on the results of the assessment by media experts, there are suggestions for improvement. Revising animated video media according to suggestions and comments given by material experts and media experts.

c. Test the product in a small group.

This animated video was tried out on 30 students of class XII SMA Wathaniyah who had studied Fluid material. After the students saw the animation video assisted by Levidio animatoon. Overall, the assessment of students' responses to the video was 1990 (88.21%). Based on the scale table the eligibility criteria turn into the very feasible category.

Table 6. Response of small group XII SMA Wathaniyah

Num	Aspect	Frequency				Score	Items	Maksimum alue	Percentages
		1	2	3	4				
1	View	0	0	138	157	1042	295	1180	88.31%
2	Quality	0	0	31	15	153	46	184	83.15%
3	Benefit	0	0	97	126	795	223	892	89%
Amount						1990	564	2256	88.21%

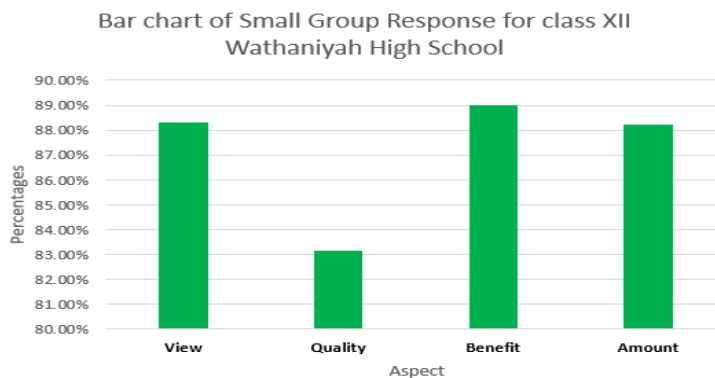


Figure 3. Bar chart of small group response for class XII Wathaniyah High School.

d. Product Revision

Revising products originate from product trials.

e. Test the product in large groups and teachers, and test the effectiveness of the media.

After revision by the experts, this animated video was tried out for physics teachers from two Dharma Pancasila and Wathaniyah high schools. After the teacher sees the video using animation then fills out a response questionnaire. The response questionnaire for this teacher consisted of 24 statement items covering aspects of appearance, quality, and material usefulness of the animated video. For SMA Wathaniyah, the average score of the teacher's response to the use of video was 83.9%.

Table 7. Response of Wathaniyah High School physics teacher

Num	Aspect	Frequency				Score	Items	Maksimum Value	Percentages
		1	2	3	4				
1	View	0	0	4	8	44	12	48	91.67%
2	Quality of Material	0	0	1	1	7	2	8	87.50%
3	Benefit of Material	0	0	3	6	33	9	36	92%
Amount						84	23	92	91.30%

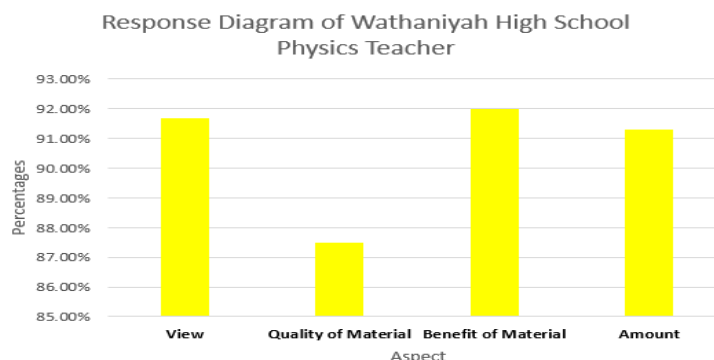


Figure 4. Response diagram of Wathaniyah High School physics teacher

The results of the trial assessment of the Dharma Pancasila SMA teachers response to video was 87 (94.57%). Based on the scale table the eligibility criteria fall into the very feasible category.

Table 8. Response of physics teacher at Dharma Pancasila High School

Num	Aspect	Frequency				Score	Items	Maksimum Value	Percentages
		1	2	3	4				
1	View	0	0	4	8	44	12	48	91,6%
2	Quality of Material	0	0	0	2	8	2	8	100.00%
3	Benefit of Material	0	0	2	7	34	9	36	94%
Amount						86	23	92	93,47%

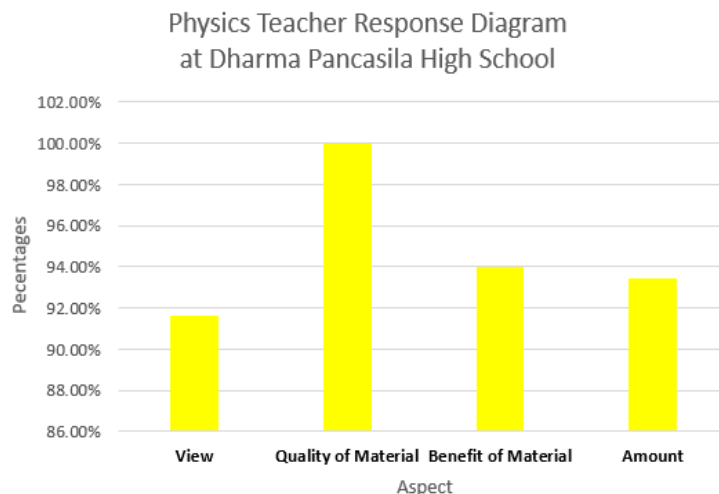


Figure 5. Physics teacher response Diagram at Dharma Pancasila High School.

After going through a series of validations and revisions, this animated video was tried out on a small group of students from class XI from SMA Wathaniyah and SMA Dharma Pancasila. After the students saw the video based on the scientific approach, then the students were asked to give a response by filling out a response questionnaire. The results of the Wathaniyah High School was 1859 (88.69%).

Table 9. Response of big group XI SMA Wathaniyah

Num	Aspect	Frequency				Score	Items	Maksimum Value	Percentages
		1	2	3	4				
1	View	0	0	136	145	988	281	1124	87.90%
2	Quality	0	0	16	28	160	44	176	90.91%
3	Benefit	0	0	85	114	711	199	796	89%
Amount						1859	524	2096	88.69%

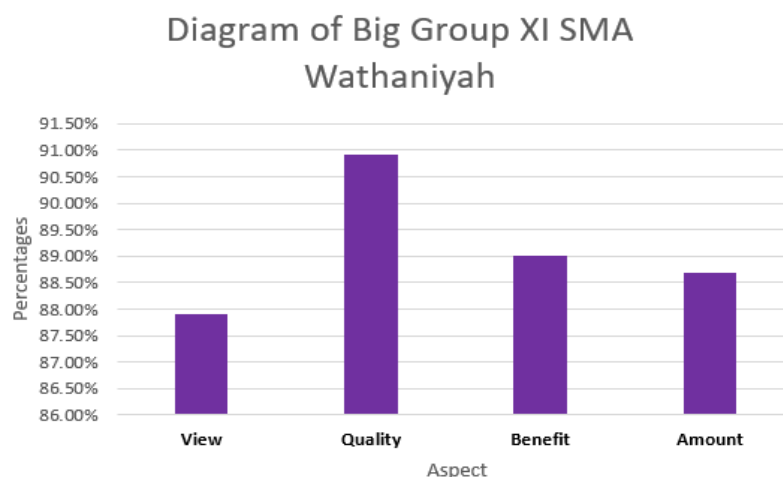


Figure 6. Diagram of big group XI SMA Wathaniyah

The results of the Wathaniyah High School trial assessment was 1451 (77%). Based on the scale table the eligibility criteria fall into the very feasible category.

Table 10. Response of big group XI SMA Dharma Pancasila

Num	Aspect	Frequency				Score	Items	Maksimum Value	Percentages
		1	2	3	4				
1	View	7	16	140	76	763	239	956	79.81%
2	Quality	0	4	27	11	133	42	168	79.17%
3	Benefit	0	30	105	45	555	180	720	77%
Amount						1451	461	1844	78.69%

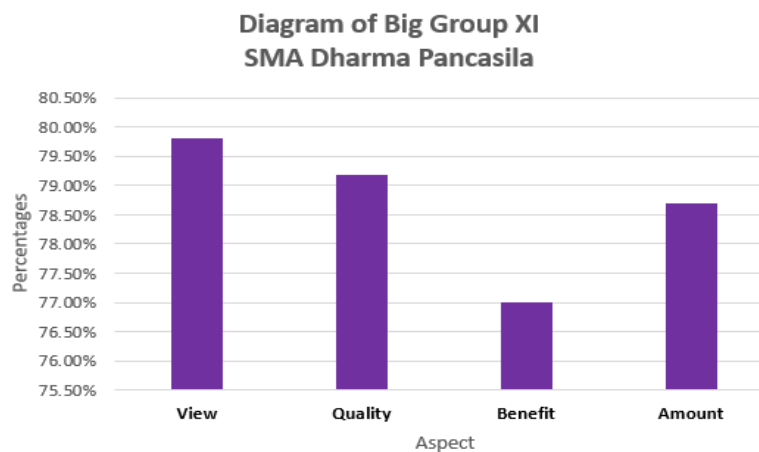


Figure 7. Diagram of big group XI SMA Dharma Pancasila

Effectiveness of Learning Videos

From the research data processing, there is an average learning outcomes of class XI students in dynamic fluid material, namely: SMA Wathaniyah, the average score of the pretest results is 46.4 and the mea value of the posttest results is 63.32. SMA Dharma Pancasila with an average pretest score of 68.5 and a posttest average score of 69.5.

7. Main product revision

After carrying out the media development stage, a product in the form of an animated video assisted by Levidio Animatoon was produced that was valid, effective and very suitable for use.

Conclusion

The conclusion of this study is that the physics animation video assisted by Levidio animatoon on fluid material that has been developed is valid and very suitable for use, with the following details: (1) Valid, because the results of the validation of material experts and media experts show that the learning videos are classified as valid criteria. (2) Effective as seen from the posttest scores of students at SMA Wathaniyah, namely 63.32 and at SMA Dharma Pancasila, namely 69.5 with good assessment category. (3) Very feasible to use, according to the results of a questionnaire regarding the learning video by the validator and student responses.

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