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Development of Animated Video on Human Digestive System Material Based on Animaker Application

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ABSTRACT
With the development of science and technology today, the learning process is not enough just to utilize learning resources and simple learning media. One way to develop learning media using technology is to develop animated learning video media. This research aims to develop animated videos based on Animaker applications, especially in Biology learning about the human digestive system. This research was conducted at Darul Qur'an Islamic Boarding School in Deli Serdang with a sample of high school class XI students. This research uses the R&D (Research & Development) method with the development of the 4D model. The development of Animaker application-based animated videos on digestive system material shows very good results with media validation results of 98.33%, material expert validation results of 90%, practitioner expert validation results of 91.46%, limited trial results with a value of 89.45% and a broad trial with a value of 88.06% obtained very valid results so that they meet the criteria very feasible to be used as learning media. Animaker application-based animated video on human digestive system material can provide new experiences, make students enthusiastic in learning, and can attract student attention and make the learning process more enjoyable.

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1. INTRODUCTION

In the current era of globalization, technological development is growing rapidly where technology can affect various things, one of which is the learning system and how to deliver material in the teaching and learning process at school (Indriyanti, N., et al, 2023). With the development of technology in the era of the industrial revolution 4.0 today, it should be able to improve the quality of the learning process, so that learning is more interesting and enjoyable for students. In realizing this atmosphere, it cannot be separated from the role of the teacher as an educator in the learning process (Asih, L. K., et al, 2023).

Learning is defined as an effort to provide knowledge to students (Parmiti, 2014). Learning is a series of reciprocal processes carried out by teachers and students in educational situations to achieve a predetermined goal (Fakhrurrazi, 2018). In addition, learning is also always required to follow the development of Science and Technology in order to be able to present a classroom atmosphere that suits the needs of the times and in accordance with the character of students and brings implications to each generation in various fields of knowledge. With the development of science and technology today, the learning process is not enough just by utilizing learning resources and simple learning media such as sketches, pictures, boards, books and others that are visual and conventional, but enriched with modern media that are electronic and audiovisual such as computers, cellphones by utilizing internet facilities. Learning media must have motivating qualities, meaning that making quality media must be able to motivate users so that learning objectives can be achieved. (Ponza et al, 2018).

Learning media is a tool that can be used by teachers to convey learning materials to students in an unusual way (Atsani, 2020). According to Sadiman (1990) media is anything that can be used to channel messages from the sender to the recipient so that it can stimulate students' thoughts, feelings, interests, and attention in such a way that the learning process occurs. Through the use of learning media, a teacher can increase the activeness and enthusiasm of students learning, so that the learning process can add insights into science and new experiences

for the students themselves. One of them is by utilizing the sophistication of technology and information that is developing today. Learning media made by teachers can be in the form of sound, video, and images (Apriansyah M, R, et al, 2020). Good media must be effective and efficient, effective means that the media is able to transfer material quickly so that students understanding after seeing the media increases and efficient means that the media is simple and can be used easily (Asih, L. K., et al, 2023).

Based on the results of observations at the Darul Qur'an Islamic Boarding School in Deli Serdang, it was found that some students felt bored, unfocused and less active in the learning process, it was also found that student' lack of understanding of some Biology learning materials, one of which was the digestive system. This is because the media used is less interesting for students, they only focus on textbooks and the use of power point as a learning source so that students find it difficult to understand the material, supported by the statement of Jundu (2020) which states that less attractive learning media can be a factor in the lack of enthusiasm for learning students in the classroom.

Learning media development can be used as one of the solutions that can be done by utilizing technology. Learning media plays a role in facilitating the process of transferring information from teachers to students, so that it can also easily stimulate students' thoughts, feelings, actions, interests and attention (Wicaksono, 2017; Yusantika, et al, 2018). One of the developments of learning media by utilizing technology is developing animated learning video media as one of the learning media sources (Agustien, R., et al, 2018). The use of technology in developing learning media is very effective because students at this time are familiar with developing technology (Fisabilillah & Sakti, 2021). Even though students have different levels of thinking, the development of animated video media in the learning process can increase the enthusiasm for learning in the classroom learning process and make the learning process more interesting for students so that they will be more enthusiastic in participating in learning (Widiyasanti & Ayriza, 2018). Animated video media provides an overview of learning materials in an audiovisual manner where students can see while reading and hear while understanding. Through animated video media, students will be more focused and excited in understanding learning materials. This is because learning theoretically through package book media will not make students able to understand the material in learning specifically. Especially for students who have a low interest in reading, making it difficult to make students understand what they have to learn during the biology learning process, especially in the basic competencies of digestive system material. The characteristics of the material are to identify the human digestive organs and their functions, and explain the process of food travel from the oral cavity to the body's metabolic waste through the anus (Iqsani, 2022).

Animation media is a moving image that comes from a collection of various objects that are specially arranged so that it moves according to a predetermined flow at each count of time (Agustin, P., 2021). Animated video media is audiovisual media with several arrays of non-living images that are in frames and are arranged mechanically so that they look alive on a screen equipped with audio. Animated video media makes it easier for students to understand lessons because videos are made audio visually, besides that video media aims to make learning activities fun so that students can be motivated to learn (Mashuri, 2020). Animated video media is used for learning media that is made as interesting as possible in accordance with the material being taught and is considered effective for increasing students' imagination and being able to channel information (Julia, 2021). Apart from being used as learning, animated video media can be used as entertainment, inspiration media or other purposes. (Putri, 2016; Ariandhini, E., et al, 2022). The use of animated video media is very suitable for students who like various types of anime and cartoons. This animated video media is packaged in such a way as to convey material in the learning process, so that by seeing interesting things from the learning video it raises the enthusiasm and understanding of student learning to be better. (Fyfield, 2019; Anzalna, L., et al, 2022).

Making animated video media can be made using applications such as animaker, kinemaster, powtoon, video scribe and others. These applications can create a display in the form of animated videos that can be customized by its users. In this study, the Animaker application was used. Animaker is an online based animation platform or software that can be used in making learning media. This application is used in making learning media, where the media made with this application contains movements complete with sounds and is equipped with transitions that can contain the learning material presented (Muhajir, Tjahjono & Muanawar, 2022). In this application, various backgrounds and characters are available. The use of the Animaker application is not difficult in programming in creating varied animations with processes carried out online (Ningtyas et al., 2021). Animaker has provided several features such as characters, text, audio and transitions so that it can present more interesting learning media that can illustrate a concept and make it easier for students to understand the material (Fajarwati, M, I., et al, 2021).

Relevant research has been conducted by Ningtyas, A. M., et al, (2021) with the title "Development of Animaker based animated videos on the theme of the area where I live in class IV SDN Banjarsari 2 Serang City" states that the product developed, namely Animaker based animated videos, can attract students' attention so that it makes students enthusiastic about learning. In addition, Oktavia, N., et al, (2022) with the title "Development of animated video media using Animaker on the topic of fractions worth in grade IV Elementary School" stated that Animaker based animated video media can help students understand the material. There is also Asih, L. K.,

et al, (2023) with the title "Development of Animaker-based animated video learning media to improve learning outcomes of elementary school students" states that Animaker-based animated video learning media makes it easier for teachers to deliver material so that students can easily understand the material, so in this case what distinguishes the research to be carried out from previous research is located at the level of education, namely high school and the material to be used, namely class XI digestive system material.

Therefore, this research aims to develop animated videos based on Animaker applications, especially in learning Biology on the material of the digestive system in humans. With the use of animated videos made through the Animaker application, it is hoped that students can have enthusiasm in participating in teaching and learning activities and this animated video can be useful for teachers in the learning process and provide new things for teachers in the use of technology as a means of developing learning media.

2. RESEARCH METHOD

This research uses the R&D (Research & Development) method. R&D (Research & Development) research is research that has a process for developing a new product or existing product so that it can be accounted for. In this study, the model used is the development of the 4D model, this model was developed by Thiagarajan (1974). The selection of this development model is based on the consideration that the 4D development model is carried out simply in terms of time and procedurally (Sugiyono, 2019).

The 4D development model consists of 4 main stages, namely define, design, develop, and disseminate (Rahayu, D & Nelmira, W, 2023). This method and model were chosen because it aims to produce a product in the form of animated video media.

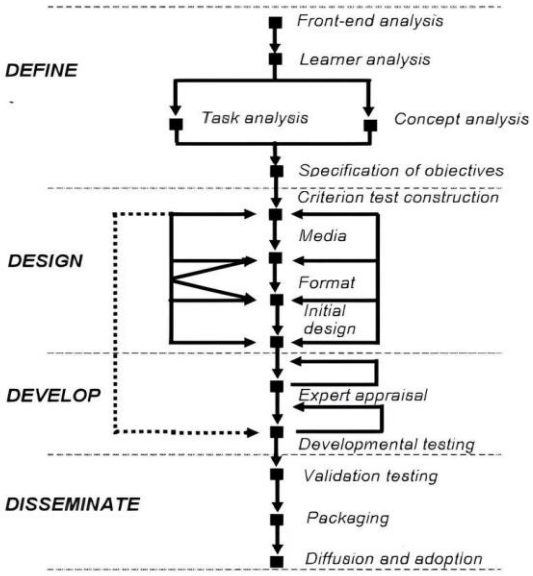

Figure 1. Research Flow Scheme

The defining stage is useful for determining and defining the requirements needed in the learning process and collecting various information related to the product to be developed and displayed in animated video learning media. The design stage is useful for determining the design to be made. The things done in the design stage are as follows: (a) constructing criterion referenced test, (b) media selection, (c) format selection, (d) initial design. This development stage aims to produce animated video learning media. This stage is divided into 2 activities, namely expert appraisal and development testing. Expert appraisal is a technique to validate or assess the feasibility of product design evaluated by experts in their fields. Development testing is an activity to test the product design on real target subjects. In this trial, data on responses, reactions or comments are sought which are then used to improve the product and then tested again to get effective results. The dissemination stage is divided into 3 activities, namely validation testing, packaging, diffusion and adoption. Validation testing is a product that has been revised at the development stage and then implemented on actual targets. Packaging, diffusion and adoption are packaging of learning media that will be disseminated to be absorbed or understood by others and used in their classes (Harjanto, A, et al, 2022).

This research was conducted at Darul Qur'an Islamic Boarding School in Deli Serdang with a sample of high school class XI students. The research implementation time was May 17 2024. The research subjects consisted of lecturers as material expert validators and learning media experts to test the feasibility of the media. Furthermore, there are expert field practitioners, namely biology teachers and students to test the practicality of

the media. Furthermore, field tests were carried out on students of class XI IPA with a limited trial of 15 students and a broad trial of 60 students to determine the effectiveness of the media with the technique of filling out a questionnaire sheet which was carried out directly.

Research Instrument

The instruments used in the study were first categorized based on their respective portions and according to the various steps when developing the desired results in the study. This study used a questionnaire, the questionnaire used in the open model devoted to interviewing educators and the sheet used to conduct the development was given in the form of a questionnaire. There are three questionnaires used, namely:

a. Media expert questionnaire sheet.
b. Content/material expert questionnaire sheet.
c. User/student questionnaire sheet (Arkadiantika, I, et al, 2020).

The questionnaire sheet used in this study uses a likert scale as a reference for preparing questionnaires with likert scale criteria used with four intervals, as follows:

Table 1. Likert scale criteria

Criteria	Score
Very Good	4
Good	3
Deficient	2
Not Good	1

Source: (Afkar & Hartono, 2017)

Data Collection Technique

In this study, the collection technique was carried out by distributing questionnaires that had been made. This was done directly at the expert validation stage, practicality test and effectiveness test, then the results of the questionnaire sheet were calculated by finding the percentage (Fakhri, F., et al, 2019).

Data Analysis Technique

Data analysis techniques in the study were carried out using quantitative and qualitative descriptive analysis. Quantitative data obtained in the form of student response questionnaire results in the form of a checklist with a likert scale of 1-4 and media feasibility scores by validators with a likert scale of 1-4. Then the data from the student questionnaire was analyzed by calculating the average answer and the results of the data analysis were then presented qualitatively (Wardana & Adlini, 2022). The data from the feasibility assessment by the validator is in the form of a percentage score which is processed using the following formula:

$$\mathbf{AN} = \frac{\mathbf{J}}{\mathbf{P}} \times \mathbf{100\ \%}$$

Information:
AN: Percentage score
J: Number of scores obtained
P: The maximum number of scores (Afkar & Hartono, 2017).

The percentage score results obtained from the questionnaire sheet in this study were interpreted in the following criteria:

Table 2. Media Criteria Percentage Scale

Percentage	Interpretation
81 % - 100 %	Very Good
61 % - 80 %	Good
41 % - 60 %	Deficient
< 40 %	Not Good

Source: (Defi & Faiza, 2021)

3. RESULT AND DISCUSSION

Research and development of animated video media for digestive system material based on Animaker application has been carried out using the Research and Development (R&D) method. The result is an animated video about the human digestive system. The results of the animated video media made by researchers are as follows:

Figure 2. Opening

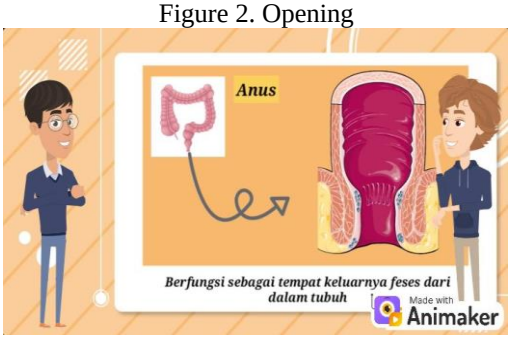

Figure 3. Content of material

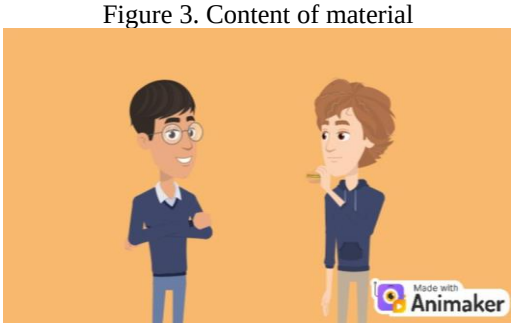

Figure 4. Closing

The data presentation and analysis stage discuss the data from the research trials that have been carried out which are then calculated based on the results of a 1-4 likert scale questionnaire which will then be analyzed. Data obtained from the results of the Animaker application-based animated video media trial in the form of assessments or validation results from material experts, media experts and practitioner validation consisting of teachers and students. Further data is obtained from the results of trials to students who are divided into 2 groups, namely a limited trial of 15 students, and a broad trial of 60 students obtained from a student response questionnaire sheet filled in directly by students. From the results of the research trials, the following results were obtained:

Media Expert Validation

The media expert validator on the animated video was validated by one media expert. This validation was conducted to test the feasibility of the animated video media developed. Media validation includes several aspects, namely the balance of text, image, sound and video composition, color selection, physical criteria, practicality and long-term use. The results of media validation can be seen below.

Table 3. Recapitulation of Media Expert Validation Results

Aspect	Score
Balance of text, images, sound and composition video	100 %
Color selection	91,66 %
Physical criteria	100 %
Practicality	100 %
Long term use	100 %
Percentage	98,33 %
Category	Very Good

Based on table 3 above, the results of the media validation analysis show that the total percentage value obtained from all aspects is 98,33 % which includes the balance of text composition, images, sound and video, color selection, physical criteria, practicality and long-term use. This shows that the animated video media based on the Animaker application developed is included in the very good category or the animated video media is very suitable for use. The comments and suggestions given by media experts are to complete the opening display with appropriate apperceptions.

Material Expert Validation

The material expert validator on the animated video was validated by one material expert. This validation was carried out to test the suitability of the material contained in the animated video media. The material assessment on this media includes learning, encouraging curiosity, supporting presentation, material accuracy, and student involvement. The results of material validation can be seen as follows:

Table 4. Recapitulation of Material Expert Validation Results

Aspect	Score
Learning	100 %
Encourage Curiosity	75 %
Presentation Support	100 %
Accuracy of Material	100 %
Student Engagement	75 %
Percentage	90 %
Category	Very Good

Based on table 4 above, the results of the material validation analysis show that the total percentage of scores obtained from all aspects is 90 % which includes learning, encouraging curiosity, supporting presentation, accuracy of material, and student involvement. This shows that the digestive system material in the Animaker application-based animated video media developed is included in the very good category or very feasible to use as learning media. The comments and suggestions given by the material experts were to add a little more material on the large intestine section regarding the appendix and remove words that are not appropriate in the animated video.

Practitioner Expert Validation

Practitioner expert validators in the development of this animated video media were validated by expert Biology teachers and students. Practitioner assessment of this media includes material, language and presentation. The results of practitioner validation can be seen as follows:

Table 5. Recapitulation of Expert Practitioner Validation Results

Aspect	Score
Material	95,31 %
Language	89,45 %
Presentation	89,64 %
Percentage	91,46 %
Category	Very Good

Based on table 5 above, the results of the practitioner validation analysis show that the total percentage of scores obtained from all aspects is 91,46% which includes material, language, and presentation. This shows that the practicality test of animated video media based on Animaker application on the material of the human digestive system developed is included in the very good category or very feasible to use as learning media. The comments and suggestions given by expert practitioners are that the sound of the music should be turned down more than the sound of the material explanation.

Limited Trial

In the limited trial stage, learning media that have been validated by material experts and media experts will be tested on 15 grade XI students at Darul Qur'an Islamic Boarding School in Deli Serdang to determine student responses to the media developed. Assessment of the overall student response to the animated video includes material, language and product presentation. The results of student response data with a total of 15 students with 14 questions are described as follows:

Table 6. Limited Trial Recapitulation Results

Aspect	Score
Material	92,78 %
Language	87,03 %
Presentation	88,57 %
Percentage	89,45 %
Category	Very Good

Based on table 6 above, the results of the analysis of student responses in the limited trial show that the total percentage of values obtained from all aspects is 89,45% which includes material, language, and presentation. An overview of the value presentation of various aspects can be seen in Figure 5 below:

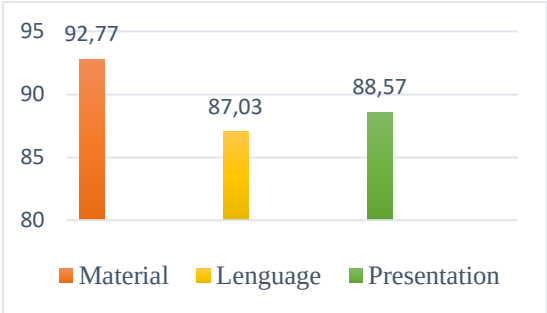

Figure 5. Recapitulation of Trial Response Results is Limited

Extensive Trial

In the broad trial stage, learning media that have been validated by material experts and media experts will be tested on 60 grade XI students at Darul Qur'an Islamic Boarding School in Deli Serdang to determine student responses to the media developed. Assessment of the overall student response to the animated video includes material, language and product presentation. The results of student response data with a total of 60 students with 14 questions are described as follows:

Table 6. Extensive Trial Recapitulation Results

Aspect	Score
Material	90,55 %
Language	86,25 %
Presentation	87,38 %
Percentage	88,06 %
Category	Very Good

Based on table 7 above, the results of the analysis of student responses in the broad trial show that the total percentage of values obtained from all aspects is 88,06% which includes material, language, and presentation. An overview of the value presentation of various aspects can be seen in Figure 6 below:

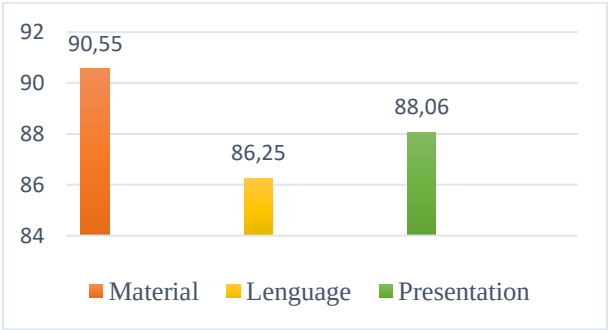

Figure 5. Recapitulation of Trial Response Results is Extensive

Based on the student response questionnaire data, the percentage score was 89,45 % at the limited trial stage and 88,06 % at the broad trial stage, so it can be said that the animated video media based on the Animaker application on the material of the human digestive system is included in the very good category according to the interpretation table according to Defi & Faiza (2021). Thus, the product developed, namely animated video based on Animaker application, received a very positive response from students and the media developed as a whole was declared very feasible to be used by both students and teachers. This is evidenced by this research which has reached a very valid category with scores in the range 81,26 – 100,00 %, supported by Akbar (2013) who argues that teaching materials that have reached the measurement level and are in the percentage range of assessment scores 81,26 - 100,00 % are said to be very valid where this score is obtained from analyzing questionnaire data on the use of teaching materials.

The world of education always continues to develop in accordance with the development of the times as a teacher we must be able to create new ideas or innovations in the world of education, especially in the development of learning media. Media development innovations made by teachers can utilize existing technology, for example animated videos. Animated videos can be applied to biology subjects, one of which is the material on the human digestive system because the animation contained in the video has a good appearance and has interesting elements (Febriana & Lena, 2021). Animated videos have the advantage of being interactive with the ability to accommodate student responses and can attract students attention so that they can increase their enthusiasm for learning, make it easier for teachers to present quite complex information and animated videos are one of the media that combines audio and visual elements. With all its advantages, animated videos provide various benefits in the world of education for teachers and students. The advantage for teachers is that this animated video can facilitate the learning process, thus helping educators in delivering material to students. This animated video is also very easy to access by educators and students. The advantage for students in using animated videos can increase students interest in learning and students understanding. The process of making animated videos can utilize existing technology, one of which uses the Animaker application. As done in this study, which is to develop an animated video about the human digestive system based on the Animaker application. Animaker is an application that can be used to create learning media, where the media created with Animaker can be used to create learning media.

4. CONCLUSION

Based on the results of the research, the development of animated video media using the Animaker application on the material of the human digestive system at Darul Qur'an Islamic Boarding School in Deli Serdang meets the criteria of being very feasible to use as learning media. Feasibility is obtained from the results of validation from media experts with a score of 98, 33% and material experts with a score of 90 %, practicality is obtained from practitioners, namely biology teachers and students with a score of 91,46 % and effectiveness is obtained from students using a limited trial with a score of 89,45 % and a broad trial with a score of 88,06 %. The final product developed is an animated video on human digestive system material based on Animaker application can provide new experiences, make students enthusiastic in learning, and can attract students attention and make the learning process more enjoyable.

It is recommended to the school to use this animated video as a medium that can be used in the learning process. So that the availability of equipment such as projectors and speakers can be used and utilized properly. As for teachers, this animated video can be used as an alternative media choice or media variation that can be used in the learning process. For readers and further researchers, they can develop media in the form of animated videos based on Animaker applications on other themes and subject matter. Hopefully this research and development can provide benefits for students.

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