



Development of Animated Video Learning Media using the Powtoon Application on the Theme of Caring for Living Things

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Abstract

Background: The background of this research is (1) the lack of availability of learning media (2) the lack of student motivation to participate in the learning process; and (3) Science learning outcomes are still not optimal. This study aims to develop learning media, analyze feasibility, analyze effectiveness, and analyze students' responses to learning media using animated videos Powtoon on caring for living beings. **Methods:** Research and Development (R&D) 4-D approach. The final findings in this research and development are limited student trials of products in the form of animated video learning media using applications Powtoon for students of class IV Public Elementary School Cibeber District. **Results:** Effectiveness trials at the development stage were carried out by researchers by doing pre-test and post-test. The known value pre-test obtains an average value of learning outcomes of 55.68. As for value, the post-test received an average score of 79.37 learning outcomes, with the number of respondents or students used as test subjects as many as 80 students from four schools. In the subsequent trial, the researcher distributed questionnaires to teachers and students. This questionnaire is limited to knowing the responses and responses of students at the dissemination stage of using animated video learning media Powtoon by getting the results of the average percentage of teacher and student responses to enthusiastic video learning media, which reached 94% in the "excellent" category. **Conclusions:** Thus, using the animated video learning media Powtoon developed is suitable for the learning process.

Keywords: Development; Video Learning; Powtoon

Introduction

The development of the times and science has provided opportunities to facilitate all activities of human life. Science and knowledge develop rapidly, with implications for most people to do so. The occurrence of fundamental and permanent changes in the social, political, economic, industrial, or cultural fields has required re-education or continuing education for all the spread of technology into people's lives which is increasingly expanding to contain a technological culture that affects all areas of life including in the field of Education (Miarso, 2013).

Technology is recognized today as being able to replace many human roles in their activities. In technology education facilities, it can be a presenter of information that teachers and students can rely upon and utilize (Ariani & Haryanto, 2010). Therefore, changes in the field of education should be carried out in a directed, integrated, sustainable, and continuous manner in line with the development of science and technology in the 21st century.

The government currently implements learning at the elementary school level in the 2013 curriculum using thematic learning. The theme is a tool or container to put forward various concepts to students as a whole. In learning, themes are given to unify the contents



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of the curriculum in one unified whole, enrich the language vocabulary of students, and learning involves several subjects to provide meaningful experiences to students. Integration in this learning can be seen from the process or time aspects, curriculum aspects, and learning and learning aspects (Hidayat, 2013).

The thematic learning model is essentially a learning system that allows students, individually and in groups to actively seek, explore, explore, and discover concepts and principles holistically, authentically, and sustainably (Rusman et al., 2013). Thematic learning emphasizes more on the involvement of students in the learning process actively in the learning process, so that students can gain direct experience and are trained to be able to discover for themselves the various knowledge they are learning. Through direct experience, students will understand the concepts they learn and relate them to other ideas they already understand (Syaifuddin, 2017).

The development of science and technology is increasingly encouraging renewal efforts in utilizing technological results in the learning process, and teachers are required to develop learning media that can be used in every learning process (Arsyad, 2011). Thus, learning media is a component of learning resources or physical vehicles that contain instructional material in the student's environment that can stimulate students to learn. The National Education Association (NEA) has a different understanding that learning media are forms of communication, both printed and audiovisual, and their equipment (Sadiman, 2007). Learning media also has a significant role in the learning process because everything that is used to channel messages can stimulate learners' thoughts, feelings, attention, and willingness to encourage a learning process that is intentional, purposeful, and controlled (Miarso, 2013). Based on the opinions of these experts, it can be concluded that the media is an intermediary tool used in clarifying understanding, information, and messages in learning so that teachers and students can use it in a more exciting learning process.

Teaching media in videos is one form of learning media used in the learning process. Learning video media is a set of components or media capable of displaying both images and sound at the same time (Sukiman, 2012). Video media is audiovisual media, apart from films widely developed for learning purposes, usually packaged in the form of VCDs (Ariani & Haryanto, 2010). The use of instructional video media products has a high level of validity. It is appropriate for use in the learning process based on the results of assessments by media experts and test response percentages with an achievement rate of 92.46% because the material presented becomes more exciting and fun and motivates students in learning (Putra et al., 2014).

Using videos with animated video types in learning is one way to increase student's interest in the learning process. Based on the literal meaning, the animation is animating, namely an attempt to move something that cannot move by itself. Energy combines computer and video with three elements: sound, images, and text, which can create dynamic and interactive presentations that combine text, graphics, animation, audio, and video images (Imamah, 2012). In general, animation media is the movement of the appearance of an object or print so that it can change its position within a specific timeline to create the illusion of moving images. The animation is an object to make it look more dynamic (Apriansyah et al., 2020). Animated video media is also very effectively used to increase learning motivation and the complicated work character of students (Wuryanti & Kartowagiran, 2016). It can be concluded that animated video is a medium that combines audio and visual media so that it attracts students' attention, which can present objects in detail and can help students understand lessons better.

The Powtoon application is an online service-based animation software application that can make it easier for users to create animated videos, with a variety of features easy to use which are accessed online and can be used in the learning process because it is a type of media that combines visualization and the use of sound, Powtoon is more provides many animations than other applications. The animation can also be adjusted easily according to the user's wishes so that it is easy to use to illustrate the material to be presented (Awalia et al., 2019). Animation in the Powtoon application is an application that has advanced features

in one screen, which can make various animations according to the needs needed. Powtoon is an innovative and straightforward online software that can create attractive animations using animated videos. Using Powtoon animated videos as learning media can increase student motivation compared to conventional media. Learning conditions using Powtoon learning media are also more exciting and not monotonous (Yulia & Ervinalisa, 2017). In schools, the Powtoon application helps teachers make it easier to explain the subject matter to students. Powtoon is available online or can be downloaded as an mp4 (video) file.

Achieving quality learning in elementary schools, of course, is not only based on theory and curriculum but also involves elements that must be considered in it. The first thing we must pay attention to in learning is the availability of a qualified educator who can condition learning well. The second is, of course, the readiness of the students to accept the learning delivered by the educators. And the third is the availability of infrastructure used as learning media (Adhkar, 2016). Teaching media in elementary schools must be interesting because of the nature of students in elementary schools who prefer to play rather than study. Therefore, the media used must be right on target and effective so that students can receive the material to be conveyed.

Based on the results of initial observations, namely by using interviews with teachers and students. This observation was carried out in 4 locations of State elementary schools located in the Cibeber sub-district, which were specialized at the grade IV level as objects of observation. Teachers only use simple media from paper or unused items, and even then, they are still constrained by time to make the press quite long and troublesome, so most teachers only do conventional learning without using media or tools to support the learning process. In grade IV at the four elementary schools, the learning is carried out thematically. The learning material used as material in the animated video learning media using the Powtoon application is theme 3, about caring for living things by taking sub-theme 1, learning natural sciences. The focus of the learning material in this study is basic Competence 3.1, analyzing the relationship between the form and function of body parts in plants. Based on the results of interviews conducted by researchers with students, there are still many who do not understand the subject matter because learning resources are only from textbooks given by lectures by the teacher. Some students say they do not understand to determine the names of body parts in plants because participants students at the elementary school level will have difficulty understanding learning material if there are no concrete tools or qualified learning media.

The researcher developed a learning animation video based on the Powtoon application for elementary school students because the learning characteristics of elementary school students are imitating, observing, and being very interested in animated cartoons. The learning animation videos are presented with exciting stories and colors that students will like. From this point of view, researchers are trying to develop an animated learning video with educational elements. The purpose of developing this learning animation video is to make students happier and better understand the material they are studying.

Method

This research method uses the Research and Development (R&D) way utilizing the 4-D (Four-D) Development model. The 4-D model is one of the research and development methods used to develop learning tools (Sugiyono, 2017). In this development research, researchers will produce an animated video learning media product based on the Powtoon application in Caring for Living Things learning with Sub-theme 1 Science learning about analyzing the relationship between forms and functions of body parts in plants using the 4-D development model.

The 4-D model was developed by S. Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel in 1974. As the name implies, the 4-D model consists of 4 stages: Define, Design, and Develop. Development), and Disseminate (dissemination) (Trianto, 2010).

Sample or Participant

The sample used is Cluster Sampling (Area Sampling). Cluster Sampling (Area Sampling) determines the selection when the object to be studied or data sources are comprehensive (Sugiyono, 2016). The model for this research was taken at Public Elementary School 1, State Elementary School 2, State Elementary School 3, and State Elementary School 4 / four schools from the number of special schools in class IV located in Cibeber District, Cilegon City.

Instrument

The instrument used in this research took four instrument techniques, namely interviews, observation, questionnaires, and learning achievement tests. This learning achievement test is the core of research on developing animated video learning media using the Powtoon application. In this test, students are given quizzes on learning material before (pre-test) and after (post-test) using the Powtoon application on caring for living things. The trial of learning outcomes is to get to what extent the effectiveness of the learning media developed by researchers for students.

Procedure

Procedulrel The research implementation process that will be carried out in schools is carried out in four stages, namely define, design, develop, and disseminate.

Data Analysis

To analyze the interview and observation data in this research, they were transcribed coherently, and the contents were outlined. The next step is to draw general conclusions from the researcher has analyzed interview results. Meanwhile, the steps in analyzing the questionnaire and learning outcomes test are by using various formulas (Widoyoko, 2009):

$$X = \frac{\sum x}{N}$$

Information:

- X = Average Score
- $\sum x$ = Total Score
- n = Number of Research Subjects

From this formula, the average score is obtained and then converted the average score into a category value.

Table 1. Data Percentage

Score Range	Percentage	Qualitative Data
$x < 4,2$	85%-100%	Very Good
$3,4 < x \leq 4,2$	67%-84%	Good
$2,6 < x \leq 3,4$	53%-68%	Enough
$1,8 < x \leq 2,6$	37%-52%	Not Good Enough
$x \leq 1,8$	0%-36%	Very Unkind

Result

This research and development discuss the development results to answer questions in developing animated video learning media using Powtoon with the theme of caring for creatures in class IV Elementary School, Cibeber District. In general, four questions must be answered in this science content learning media development research. (1) What are the stages of Developing Animated Video Learning Media Using Powtoon Caring for Living Things Theme Science Class IV Public Elementary School in Cibeber District, (2) What is the feasibility of Developing Animated Video Learning Media Using Powtoon Caring for Living Things Theme Science Class IV Elementary School Negeri Kecamatan Cibeber, (3) How is the effectiveness of Developing Animated Video Learning Media Using Powtoon Themed Caring

for Living Creatures Science Subject Grade IV Public Elementary School Cibeber Subdistrict, (4) What is the response of students to the Development of Learning Media Animated Videos Using Powtoon Themed Caring for Living Creatures Science Subject Class IV Public Elementary School, Cibeber District. Based on the results obtained, the following matters can be discussed.

Development of Animated Video Learning Media Using Powtoon

In this section, the researcher used the Define and Design stages. At the Define stage, the researcher conducted a needs analysis by collecting information from interviews and observations of teachers and students about the learning process implemented in the school.

Based on the results of interviews conducted with students in four schools in the Cibeber District, it was found that science learning, especially on plants or living things, made them interested and increased their enthusiasm for learning. While the obstacles faced by students, sometimes it is difficult to memorize and understand terms in plants. As for the results of observations through observations made by researchers. The researcher concluded that using learning media in science subjects in class IV at the four schools did not make students active in learning. In their use, the learning media used by teachers was not effective and efficient.

Meanwhile, the design stage consists of four stages, namely, (1) potential problems, (2) media selection, (3) format selection, and (4) initial design.

In the first stage, namely the potential problem is the initial activity before developing an animation video learning media based on the Powtoon application in learning to care for living things, sub-theme 1, namely the functions and parts of the plant body in science class IV Elementary School, Cibeber District. The researcher found that the learning media used by teachers were still limited to printed media in the form of pictures to explain the material. In addition, students' different levels of ability to understand learning material is a fundamental problem. With this potential problem, researchers develop learning media in the form of science animation videos with functions and parts of the plant body to minimize learning problems in class.

The second stage is the selection of media for researchers to develop learning media in the form of science animation videos with the subject of functions and parts of the plant body to minimize learning problems in class. The researcher made a Learning Implementation Plan (RPP) for science subjects for class IV Concerning Living Things in this step.

In the third stage, namely selecting the format, the data obtained from the pre-research was collected as planning material for developing instructional media. The materials were collected and made a Story Board for this development research.

The fourth stage is the initial design of the product. The product produced in this research and development is animated video learning media based on the Powtoon application with the theme of caring for living things developed by researchers. The following are the results of the initial design of the resulting product:

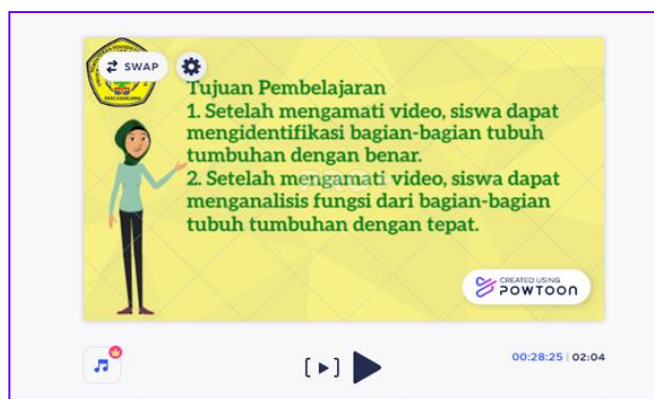


Figure 1. Initial View of Powtoon Application Learning Animation Video

The initial appearance of the learning animation video contains opening greetings and an introduction to the learning theme material, learning objectives, animated images of female teachers, teacher voice records and back sounds, and attractive background displays.

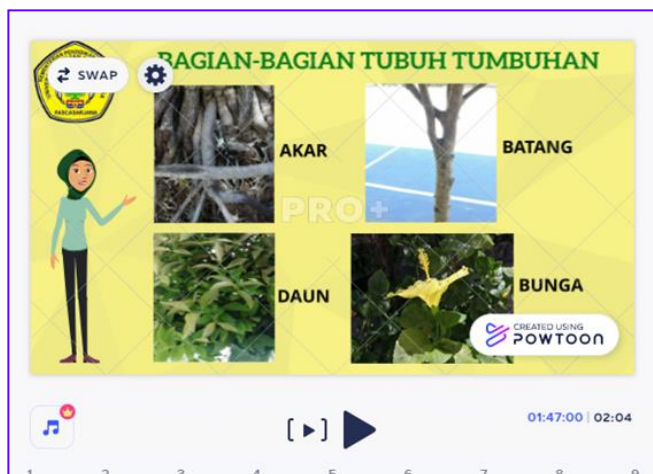


Figure 2. Explanation of Material in Learning Animation Videos

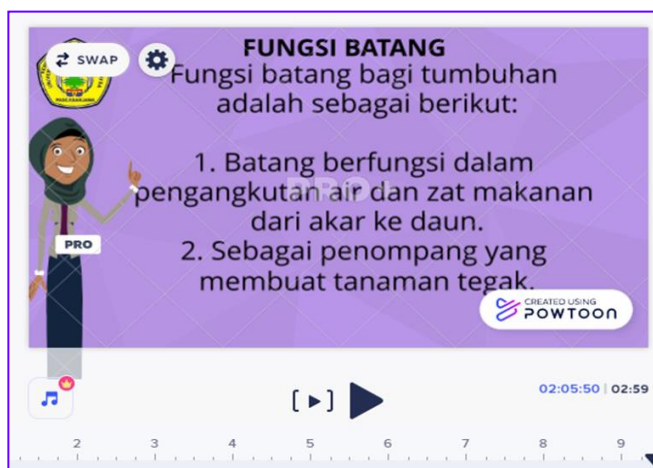


Figure 3. Explanation of Material in Learning Animation Videos

The material presented follows the learning objectives that have been determined. The material shown in [Figure 2](#) and [Figure 3](#) includes material regarding body parts in plants and material on the function of stems.

Feasibility of Animated Video Learning Media Using Powtoon

In this section, the researcher uses the Develop stage. This stage is carried out, namely expert appraisal in design validation to assess the feasibility of media and material experts.

Table 2. Display Aspect Media Expert Final Validation Test Results

Assessment Indicator	Score
Proportional layout (layout of text and images)	4
Background selection suitability	4
Matching color proportions	4
The suitability of the selection of fonts	5
Appropriate font size selection	5
Letter variations	5
Use of spacing (lines, spaces, paragraphs)	4
Easy-to-read writing	4
Music/sound clarity	5
Appropriateness of music/sound selection	5
The attractiveness of the animated dish	4

Suitability of animation with the material	4
Compatibility of the video with the material	4
The narration in the video is easy to understand	4
Consistency of presentation between pages	4
Increase student interest in the material	4
Not boring	4
Total	73
Average Score	4,3
Percentage	87%
Category	Very Good

Table 3. Final Validation Test of Media Expert Programming Aspect

Assessment Indicator	Score
The ease of using animated video media	4
Setting the duration of the video according to the students	4
Freedom to choose material to study	4
The type of music used in the video follows the characteristics of the students	5
The music used in the video does not interfere with the conversation in explaining the material	4
Learning animation video media can be run in several software	4
Animation video media can be reused in learning to develop other learning	4
Total	29
Average Score	4,1
Percentage	82%
Category	Good

Based on the results of media validation before the product was tested for effectiveness, all display aspects presented were rated "Very Good," with a score of 87%. In comparison, all programming aspect boutiques presented were rated "Good" with a score of 82%. Based on this validation, the media expert lecturer stated that the learning media was excellent and worthy of field trials without revision.

Table 4. Final Expert Validation Test Results for Material Aspects of Content/Material

Assessment Indicator	Score
Scope (breadth and depth of content)	4
The material is presented coherently and systematically	4
Clarity of content	4
Ease of understanding the material	4
Explanation examples are included	5
Sufficient examples are included	5
Clarity of language used	4
Language suitability with the target user	4
Clarity of information on image illustrations	4
The learning videos presented to explain the learning material	4
Grammatical and spelling accuracy	4
The language used arouses students' curiosity	4
Total	50
Average Score	4,2
Percentage	84%
Category	Good

After being validated by the material expert lecturer, all the content/material aspects and learning aspects presented were rated "Good," with scores of 84% and 80%. Based on this validation, the material expert lecturer stated that the learning media was very good and worthy of field trials with revisions according to suggestions. As for revisions/suggestions, there is only one note: "too much writing." These suggestions become a reference for researchers to continue improving the media that are developed in the future.

Table 5. Final Expert Validation Test Results for Aspects of Learning Materials

Assessment Indicator	Score
The clarity in learning objectives	4
The material provided is by the Core Competencies	4
The material provided is by Basic Competency	4
The concept, according to indicators	4
Clarity of the title on the video	4
Clarity of user goals	4
The accuracy of the application of learning strategies (study independently)	4
Variations in the delivery of types of information	4
Accuracy in the explanation of conceptual material	4
The attractiveness of the material in motivating users	4
Total	40
Average Score	4
Percentage	80%
Category	Good

The Effectiveness of Developing Animated Video Learning Media Using Powtoon

In this section, researchers still use the Develop stage, which is carried out, namely development trials (effectiveness testing). The product trials developed were conducted in small groups using a learning material questionnaire designed by the researcher.

Researchers carried out this development trial by conducting a pre-test and post-test. The pre-test is completed by completing a quiz/test of learning outcomes before using animated video media. At the same time, the post-test is carried out by filling out a quiz/test of learning outcomes after using animated videos using Powtoon in learning. The researchers did this to determine students' learning outcomes before and after using animated videos using Powtoon in science subjects with the theme of caring for living things.

Table 6. Overall Pre-Test Results

Research Subject	Score
State Elementary School 1	1.395
State Elementary School 4	1.415
State Elementary School 2	685
State Elementary School 3	960
Total	4.455
Average	55,68

In the pre-test results, Public Elementary School 1 had an average score of 60.6, State Elementary School 4 58.9, State Elementary School 2 53.3, and State Elementary School 3 received an average of 45.6. As a whole, the four schools received an average score of 55.68. With this average score, many students still have not been able to achieve the KKM expected and set by the school. Therefore, researchers must appropriately respond to achieving essential competencies by providing remedial or enrichment services. In this case, the researcher developed an animated video learning media using Powtoon as a corrective tool from previous learning outcomes.

Table 7. Overall Post-Test Results

Research Subject	Score
State Elementary School 1	1.925
State Elementary School 4	1.940
State Elementary School 2	1.395
State Elementary School 3	1.090
Total	6.350
Average	79,37

In the post-test results, Public Elementary School 1 had an average score of 83.7, State Elementary School 4 80.8, State Elementary School 2 77.5, and State Elementary School 3 received an average value of 72.6. As a whole, the four schools have an average score of 79.37. Thus, there is an average difference between pre-test and post-test learning outcomes, which means that animated video learning media using Powtoon can increase learning effectiveness.

Student Response to the Development of Animation Video Learning Media Using Powtoon

In this section, the researcher still uses the Disseminate stage to promote the product developed so that it is accepted by users by individuals, groups, or systems. At this stage, the researcher made a response questionnaire for users, namely teachers and students at school.

The final stage of this research and development is the limited dissemination stage of the product in the form of animated video learning media using Powtoon for fourth-grade students at Cibeber District Public School. This trial is limited to the responses and responses of teachers and students. This dissemination has been carried out to four Public Elementary Schools in Cibeber District: State Elementary School 1, State Elementary School 4, State Elementary School 2, and State Elementary School 3. The subjects of this study were teachers and students of class IV.

Table 8. Results of Teacher and Student Responses

Research Subject	Score
Teacher	4,7
Learners	4,8
Total	9,5
Average	4,7
Percentage	94%
Category	Very Good

The test results on four teachers and 80 students overall obtained an average score in the "Very Good" category. The results of the teacher's response, in this aspect of the assessment, the percentage of teachers (respondents) reached 94% (Very Good). The results of student responses, in this aspect of the evaluation, the percentage of students (respondents) reached 96% (Very Good). The overall response data obtained the percentage of teachers and students (respondents) achieving 94% (Very Good).

Thus, the developed animated video learning media using Powtoon is suitable for use in the learning process and gets a "Very Good" response at the dissemination stage.

Discussion

Development of Animated Video Learning Media Using Powtoon

In general, the development of animated video media using Powtoon as a learning medium on the theme of caring for living things which was developed for grade IV Elementary School in Cibeber District, has been well developed. Since collecting data, they are analyzing media needs, designing media, and providing revisions to the appearance of the media being developed and the response from teachers and students.

Based on this, it is true that the media is an intermediary or delivery of messages from the sender to the recipient. More specifically, the teaching and learning media tends to be interpreted as graphic, photographic, or electronic tools for capturing, processing, and rearranging visual or verbal information (Kustandi, 2011). In relation, media in learning is anything that can channel messages from the sender to the recipient of the letter to stimulate students' thoughts, feelings, attention, and interests so that the learning process occurs. Learning media can be interpreted as anything that is used to convey messages and can stimulate thoughts, feelings, attention, and a willingness to learn so that it can encourage a deliberate, purposeful, and controlled learning process (Miarso, 2013). So, it can be concluded that the media is an intermediary used in conveying material in learning activities.

Learning media is a tool for sharing messages and clarifying meaning in learning materials delivered to students.

Feasibility of Animated Video Learning Media Using Powtoon

Overall, the validator's response to the feasibility of developing animated video learning media using Powtoon as a learning medium on the theme of caring for living things in class IV of Cibeber District Public Elementary School gave excellent responses based on validation conducted by researchers on media experts and material experts on the learning media developed by researchers. Based on the initial validation, the researcher found that the percentage of media on the display aspect was 82% on the programming aspect, 73%, and the percentage of material on the content/material aspect was 49% on the learning aspect, 49%. As for the results of the final validation after the product revision, the researcher got a media percentage of the display aspect of 87% in the programming aspect of 82% and a percentage of material in the content/material aspect of 84% in the learning aspect of 80%.

This feasibility is found in the function of the media in the learning process, which will be able to support and enhance learning activities for students because it is a tool that can assist the learning process and functions in stimulating students' interests, thoughts, and feelings so that they can achieve learning goals better and perfect. The use of media in the learning process has functions, namely: 1) Increasing the effectiveness and efficiency of learning, 2) Increasing student learning enthusiasm, 3) Increasing student interest and motivation, 4) Making students interact directly with reality, 5) Overcoming various student learning modalities, 6) Streamlining the communication process in learning, 7) Improving the quality of learning (Alfiani et al., 2018).

Based on the adequacy of Powtoon animated video media and the expert opinion above, it can be concluded that the function of learning media is to attract students' attention in learning, to increase student motivation in the learning process, to increase student attention in the learning process, to help students understand learning material. Apart from being able to attract attention and increase student enthusiasm in the learning process, learning media also functions in the process of gaining student experience in learning because learning that is commonly used with books is abstract so with the function of teaching media, the experience process that students get will become more concrete.

The Effectiveness of Developing Animated Video Learning Media Using Powtoon

Overall, the results obtained by the pre-test and post-test in measuring the effectiveness of developing animated video learning media using Powtoon with the theme of caring for living things in class IV of Cibber District Public Elementary School can be seen that the pre-test scores obtained an average learning outcome of 55,68. Meanwhile, the post-test score received an average learning result score of 79.37, with the number of respondents or students used as trial subjects as many as 80 students from four schools in Cibeber District.

Based on these results, there are six criteria in choosing learning media, namely 1) By the objectives to be achieved, 2) Appropriate to support learning content that is facts, concepts, and principles, 3) Practical, flexible, and enduring. 4) Teachers must be able to use it in the learning process, 5) Grouping targets. 6) Technical quality (Arsyad, 2011). The use of media in the learning process has excellent benefits, including the following: 1) Capturing an object or specific events, 2) Manipulating certain circumstances, events, or objects, and 3) Adding enthusiasm and motivation to student learning (Sanjaya, 2012).

Based on the results of this effectiveness, the use of learning media can assist teachers in designing more varied learning methods; the activities carried out by students are not only listening to the teacher delivering material. Students can carry out other activities such as observing, conducting simulations, demonstrating something, evaluating, and other activities that can help achieve meaningful learning objectives.

Student Response to the Development of Animation Video Learning Media Using Powtoon

Overall, students gave excellent responses regarding the development of animated video learning media using Powtoon with the theme of caring for living things in class IV of Cibeber District Elementary School, both teachers, and students obtained a percentage of 94%.

Using video as a learning medium provides a new experience for students and facilitates students in achieving learning goals. Video and television media can take students anywhere, especially if the place or event being broadcast is too far to reach. By showing the video, students can feel like they are in or participating in the atmosphere described. Media in the form of a simulation is a description that describes a situation (Yudianto, 2017).

The influence of video media will enter human beings more quickly than other media because the display is a focal point of light, so it can affect human thoughts and emotions. In teaching and learning activities, focusing on and influencing the emotions and psychology of students is very necessary. Because with this, students will more easily understand the lesson. Of course, video media delivered to students must be related to learning objectives.

Learning video media means time, space and messages can be delivered more efficiently, so students can be invited to communicate learning material quickly. Videos can also feature objects that are too small, too big, dangerous, or even that students can't find directly. So learning videos can explain abstract explanations and are very good at explaining a process (Khairani et al., 2019).

Conclusions

Learning media development using the Powtoon application on caring for living things, in general, has been well developed. In terms of feasibility, learning media using the Powtoon application on material caring for living things gets excellent responses, according to media and material experts' assessment of the validator. While the effectiveness of the Powtoon learning media was tested through a pre-test and post-test process on students, the post-test results were better than the pre-test results, which had reached the minimum learning mastery criteria determined by the school. The response to the use of learning media using the Powtoon application as a whole received excellent responses from teachers and students as users.

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Declaration statement

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