



Animated Video-Based Learning Media on Science and Social Content on the Water Cycle Topic for Fourth Grade of Elementary Schools

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ABSTRAK

Kurang adanya pemanfaatan media pembelajaran didalam proses pembelajaran serta proses pembelajaran selalu berpusat pada guru. Hal itu mengakibatkan peserta didik sulit memahami materi yang disampaikan sehingga suasana kelas menjadi pasif. Tujuan penelitian adalah mengembangkan media pembelajaran berbasis video animasi yang valid dan praktis pada muatan IPAS topik siklus air kelas IV SD. Peneliti menggunakan model ADDIE dalam mengembangkan media ini langkahnya meliputi analisis, desain, pengembangan, implementasi dan evaluasi. Penelitian ini mengambil subjek ahli materi, ahli media, praktisi dan respon siswa, dalam penelitian ini menggunakan metode analisis deskriptif kualitatif dan kuantitatif. Hasil rerata validitas video animasi dari ahli materi 95,5% predikat sangat baik, dari ahli media 92% predikat sangat baik, dari praktisi 98% predikat sangat baik serta dari respons siswa 96,9 predikat sangat baik. Media pembelajaran berbasis video animasi topik siklus air dinyatakan lolos pengujian validitas dan layak dipergunakan untuk kegiatan belajar mengajar siswa kelas IV sekolah dasar. Implikasi dari penelitian ini adalah bahwa penggunaan media pembelajaran berbasis video animasi yang valid dan praktis dapat meningkatkan pemahaman siswa, menciptakan suasana belajar yang lebih aktif dan interaktif, serta menggeser pendekatan pembelajaran dari berpusat pada guru menjadi lebih berpusat pada siswa.

ABSTRACT

There is a lack of use of learning media in the learning process and the learning process is always teacher-centered. This makes it difficult for students to understand the material delivered so that the classroom atmosphere becomes passive. The purpose of the research is to develop a valid and practical animated video-based learning media on the topic of water cycle in grade IV elementary school. The researcher uses the ADDIE model in developing this media with steps including analysis, design, development, implementation and evaluation. This study takes the subject of material experts, media experts, practitioners and student responses, in this study using qualitative and quantitative descriptive analysis methods. The average results of the validity of animated videos from material experts were 95.5% very good, from media experts 92% were very good, from practitioners 98% were very good and from student responses 96.9 were very good. The learning media based on the animated video on the topic of the water cycle was declared to have passed the validity test and is suitable for use in teaching and learning activities for grade IV elementary school students. The implication of this study is that the use of valid and practical animated video-based learning media can improve student understanding, create a more active and interactive learning atmosphere, and shift the learning approach from teacher-centered to more student-centered.

1. INTRODUCTION

IPAS (Natural and Social Sciences) is an independent curriculum subject that combines Natural Sciences (IPA) and Social Sciences (IPS) subjects. The combination of subjects is based on these considerations which tend to be carried out by elementary school students to see everything holistically and integrately. It is hoped that the combination of science and social studies subjects will encourage students to be able to manage the natural and social environment in one unit (Diyantari et al., 2020; Septiana, 2023). IPAS is a science that contains information about living things and inanimate objects in the

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universe and their interactions, and contains human life as an individual as a social being who interacts with the surrounding natural environment (Azzahra et al., 2023; Febriani, 2021). The main focus of science learning in the SD/MI/Package A program is not on the amount of material content that students can absorb but on the students' ability to use the knowledge they have. By considering that elementary/MI/Package A children always see everything as it is, then in integrated science and social studies learning, science and social studies learning is simplified into one subject, namely science (Septiana, 2023; Vriyanti et al., 2023).

Science is the science of nature and everything that exists in this universe (Cherly Ana Safira et al., 2020; Cicilia et al., 2019). Science subjects are basically used to foster students' curiosity, understanding, skills and awareness to appreciate the universe that God has created while upholding their environment. Science uses human observations to study natural phenomena. Science learning emphasizes how students can connect their initial (cognitive) knowledge with the material to be studied. To create a process of business learning activities that can be carried out so that it runs effectively and efficiently, education actors can utilize learning media (Mahmudah, 2018; Nata & Putra, 2021).

Learning media is a place to send messages, the material that is informed is a learning message that is the goal in the learning process (Aghni, 2018; Putri Wangi & Gede Agung, 2021). Learning media can be interpreted as a tool in the learning process inside and outside the classroom, in addition, learning media can be used as teaching materials that can encourage students to foster student enthusiasm in the learning process. Learning media is an intermediary, means, and connecting media to communicate, disseminate or convey ideas and messages to stimulate students' feelings, thoughts, behavior, interests and attention so that their learning activities run well (Maulana et al., 2020; Sugawara & Nikaido, 2014). Learning media is presented as an intermediary tool for learning media which is used to help stimulate students' interest in carrying out learning activities.

Learning video media is a technology for recording, capturing, managing, storing, delegating and forming to present images of events in motion electronically. Learning video media is an electronic media that can communicate visuals and audio simultaneously to produce an interesting and dynamic video. Learning videos can show something that is still a child's imagination or was initially impossible to see (Ponza et al., 2018; Teppa et al., 2022). The availability of video media in the learning process can help students achieve abilities in the cognitive, affective, psychomotor domains and improve interpersonal skills.

Animated video is a computer program used to deliver learning that contains digital content with combinations of audio, text, images and animation as a whole in an integrated manner (Achmad et al., 2021; Antika et al., 2019). Animated video is the movement of one frame with another frame that is different from each other in a predetermined time duration, so that it creates the impression of movement and there is also sound that supports the movement of the image, for example the sound of conversation or dialogue and other sounds. The use of animated video-based learning media in the teaching and learning process is expected to be able to arouse interest, stimulate and motivate students to learn. Designing effective learning media must meet the criteria of media made as simple as possible, easy to understand, interesting so that students are motivated to learn. MMedia has a very important role because it functions to convey messages, helps students to more easily understand the explanations given by the teacher, makes teacher communication better, and interactions are multi-directional (Magdalena et al., 2021; Tafonao, 2018). Improving the quality of teaching and learning and learning achievement can be done by determining learning media that are appropriate to student characteristics.

Learning animation videos are animated cartoon videos filled with lesson materials so that they can be used as learning media for elementary schools because of their interesting and funny nature and are suitable for elementary school children (Dimas Nuswantoro & Vicky Dwi Wicaksono, 2019; Tantina & Yulia Eka Yanti, 2022). Animated video-based learning media is created using the Powtoon application. Powtoon is defined as a learning media in the form of an online application that presents presentations through animated videos. The Powtoon application is very easy to use because the results are in the form of videos and are easy to animate, can attract the interest of elementary school students and is easy to access anytime and anywhere. The Powtoon application provides music, users can add sound (audio recording), animate handwriting and provide transitions with various colors that make learning more enjoyable and alive.

Observations have been conducted in class IV of SD Negeri 2 Tianyar. The results of the observation show that the lack of student involvement or interest in the learning process of 22 students, only 40% are active and enthusiastic in following the process of the science subject, while 60% show a total lack of interest or low student involvement in the science subject. This shows that the learning carried out in class IV is still very far from achieving learning objectives. At this time, teaching and learning activities in schools have been carried out normally since post-Covid-19 and several problems were found faced by class IV students in the science learning process (Isroqmi, 2020; Sari et al., 2017).

Rooted in these findings, to overcome this problem, the research will develop an interesting learning media. One of the interesting learning media for students is by utilizing technology by making an

animated video. Animated videos are made using the Powtoon application. The Powtoon application, with its easy use, does not need to make animated videos because the Powtoon function already exists so that powtoon can provide understanding to students because it provides illustrations related to the material. Animated videos are developed to make it easier for students in the learning process and are able to understand the material well, students in the learning process tend to be very bored without using assistive media such as animated videos and lack of student motivation in learning activities (Awalia et al., 2019; Sukarini & Manuaba, 2021). Animated videos are very suitable for use, especially for science subjects, this is because...arena by using animated video media abstract concepts to make them more concrete. This can explain the process and series of events of the water cycle through moving images based on real events that occur in our environment, so that the delivery and learning of water cycle material can be more interesting, efficient, and effective. Learning videos make the material presented have an appeal and are systematically arranged, with some hopes that students can learn with or without teacher guidance (Octavyanti & Wulandari, 2021; Puspitarini & Nuraeni, 2019). An animated video product that was developed obtained a feasibility score in the assessment of experts and students of 4.23 with a very good category so that it is suitable for use in the learning process.

The novelty of this research lies in the development of animated video-based learning media using the Powtoon application for the topic of the water cycle in the science subject for grade IV Elementary School students. This research stands out because it combines elements of science and social studies in one interactive and interesting media, in accordance with the independent curriculum that integrates the two subjects. This innovation not only presents material holistically and integratedly, but is also designed to increase student engagement and motivation in learning. By using animation technology, this research offers a new approach to visualizing abstract concepts, making them easier for students to understand. In addition, the use of the Powtoon application as a tool to create interactive and easily accessible learning media is a significant breakthrough in utilizing technology for elementary education, providing a more dynamic alternative to traditional learning methods that tend to be monotonous.

Based on the description, a research entitled "Development of Animation Video-Based Learning Media on the Water Cycle Topic for Grade IV Elementary Schools" will be conducted. This research aims to produce and develop a product in the form of animation video-based learning media on the science content of the water cycle topic for grade IV elementary schools to determine the feasibility of animation videos so that they can be used as learning media and the objectives of learning activities can be achieved optimally.

2. METHOD

This study uses the research method (Research and Development/ R&D). The research and development (R&D) method is a type of research in which a product is created with the aim of testing the validity, practicality, and effectiveness of the product (Sugiyono, 2014). The ADDIE development research model is a systematic learning model designed to solve learning problems related to learning resources.. The stages of the ADDIE model are Analysis, Design, Development, Implementation and Evaluation.

In this study, data were collected through a non-test method known as (1) the observation method. The observation method collects data through direct observation to gain an in-depth understanding of the context of the data in a broad social context. The observation method is a data collection method that has a strong methodological character. The observation method in this study was carried out by direct observation at the research school with the problems encountered by the researcher at the research school to determine the right solution (Ilhami & Rimantho, 2017; Wiyono et al., 2018). (2) Interviews are a method of collecting information by giving respondents a number of statements that must be answered verbally regarding problems that arise directly and indirectly at the scene. (3) The questionnaire method is a method used by researchers to collect data on the phenomena being studied by distributing or spreading questionnaires where respondents answer the questions (Agung, 2014; Nasution & Oktaviani, 2020)

The data analysis methods and techniques used in this development study use qualitative and quantitative descriptive analysis methods. (1) Qualitative descriptive analysis is a way of analyzing data in the form of words or sentences about an object systematically and drawing general conclusions. In this development, qualitative descriptive analysis is used to collect information from suggestions, criticisms, responses and comments based on media expert tests, on media that have been developed using questionnaires or surveys. (2) Quantitative descriptive analysis is a method of analyzing data in the form of numbers or percentages about objects systematically in order to provide general conclusions. This development uses quantitative analysis to find out the general picture of the distribution of data as values obtained from expert assessment sheets. This makes it possible to process the results of the questionnaire into data and process the results of performance assessments using observation sheets.

3. RESULT AND DISCUSSION

Result

The purpose of this study was to produce animated video-based learning media on the content of the science content of the water cycle for grade IV Elementary Schools. This study used two material experts, two media experts, two practitioners, and twenty-two students as subjects. The ADDIE development research model was used. The ADDIE development model has five interrelated stages. The stages of the ADDIE model are analysis, design, development, implementation and evaluation.

Analysis stage conducted with several steps, namely curriculum analysis. This analysis was conducted as part of the preliminary research process in the form of interviews and observations of Class IV teachers of SD Negeri 2 Tianyar to determine the problems and needs in implementing the learning process. Based on the results of the analysis carried out, it is known that in the learning process, only print media such as textbooks and picture media in the classroom are used to teach students, so that learning in the classroom becomes monotonous and less enjoyable. The lack of varied learning media results in decreased interest in learning for students. After knowing the problems in SD Negeri 2 Tianyar class IV. So it is very necessary to have learning media that can increase students' interest in learning and the learning process, namely by creating interesting learning video media by making animated videos.

Design stage There are 3 concepts that must be designed, namely: (1) Design concept, in making this animated video-based learning media, the creation of this animated video-based learning media begins with determining the design concept of the animated video. Animated videos are made using the Powtoon application with a duration of 7-13 minutes. This video consists of three parts, namely the opening, core, and closing. The opening part contains an intro, greeting students and connecting the topic with the student's environment. The core part includes asking questions, providing explanations, and explaining the process of the water cycle. While the closing includes ending the video with greetings and thanks and an outro. (2) media concept, after determining the design concept, continue by determining the concept of the media created. This media concept combines 4 concepts, namely images, animation, text and sound. These elements can make learning videos more effective, interesting and effective. (3) script concept, design concept and media concept are then integrated into a video script concept so that the production process of animated video-based learning media is more structured. The video script explains each scene in detail, the narration, the music used, the animation used and the duration of each scene.

Development stage was carried out to develop animated video-based learning media on the science content of the water cycle topic for grade IV Elementary School from the results that had been previously created and designed, after which research was conducted on the product by experts to determine the validity of the animated video-based learning media that had been developed. so that improvements can be made to the suggestions and input given. Animation video-based learning media consists of three parts, namely the opening, core, and closing.

The opening section consists of several contents explained below. The intro is made with animation containing text in the form of an opening greeting (Om Swastyastu), logo, self-identity, title, and learning objectives. The intro video section is shown in [Figure 1](#).

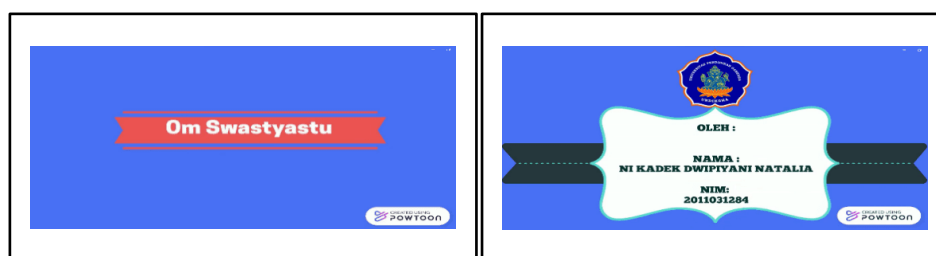


Figure 1. Intro Section

Then in the core part of the video, it consists of parts such as asking questions, presenting material, presenting material that can be explained in [Figure 2](#).

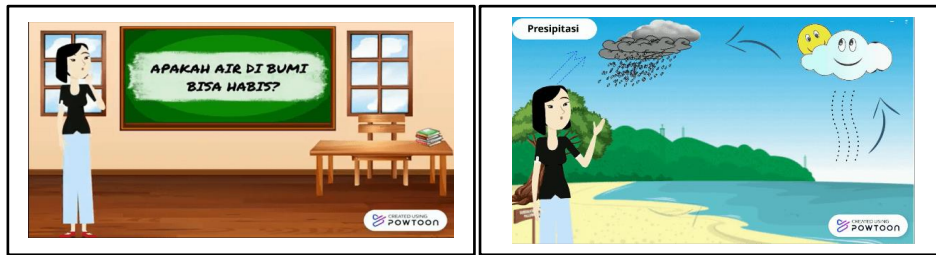


Figure 2. Asking Questions

In this closing section there is an outro section. The outro is made using text animation with the words "Hopefully Useful", closing greeting (*Om Santih Santih Santih Om*), the words "Thank you", and Video Credit in the form of the name of the supervisor, background and music used are shown in Figure 3.



Figure 3. Closing Section

Validity test of animated video-based learning media on the content of the water cycle topic using 2 material experts, 2 media experts, 2 practitioners and 22 student responses. The data from the validity test of the learning media were analyzed to determine the validity of the developed animated video-based learning media. Data analysis was calculated using the average score obtained through the assessment sheet from the experts. The data was then converted with validity assessment criteria on a scale of five to determine the validity qualification of the developed animated video-based learning media.

Implementation stage conducted by implementing video animation-based learning media that has been created. At the implementation stage, it was developed to determine the practicality of video animation-based learning media products in schools directly to 2 practitioners and 22 students in order to determine the response to the media provided. At this stage, a field test was carried out involving all fourth-grade students of SD Negeri 2 Tianyar. The field trial was conducted to determine students' responses to video animation-based learning media that had been developed. This activity was designed to answer the question of whether the product developed can increase students' interest in learning in achieving learning objectives.

Evaluation stage carried out with the aim of perfecting the animated video-based learning media that has been created. Evaluation in this study was conducted using the formative evaluation method. Assessment was conducted on each development of animated video-based learning media to ensure that the developed product has good quality. The assessment results obtained from the product implementation stage are used as considerations for implementing improvements to the animated video-based learning media that have been created, in order to create animated video-based learning media whose validity has been tested, several parts of the animated video were improved based on input from research subjects.

The results of the data analysis from the animation video validity test were then analyzed to find out the validity of the animation video that had been developed. This analysis was carried out by calculating the average value obtained on the assessment sheet by material experts, media experts, and practitioner responses and student responses. The results were then converted with a five-scale conversion guideline to determine the qualifications of the animation video that was made. The results of the product validity test are shown Table 1.

Table 1. The Product Validity Test Results

No	Validity Test Subject	Validity Results	Category
1	Subject Matter Expert	95.5%	Very good
2	Media Expert	92%	Very good
3	Practitioner	98%	Very good
4	Student Response	96.9%	Very good

Based on [Table 1](#), video-based learning media on the content of the water cycle topic of science in grade IV elementary school has a material validity percentage of 95.5% categorized as very good, a media validity percentage of 92% categorized as very good. Teachers' responses to animated video-based learning media on the content of the water cycle topic of science are very good with a score of 98% categorized as very good, and students' responses to animated video-based media on the content of the water cycle topic of science are very good with a score of 96.9% categorized as very good. This shows that the development of animated video-based learning media is feasible to be used to support learning activities.

Discussion

The development of animated video-based learning media on the topic of the water cycle for grade IV elementary school students is declared feasible to use because it has been carried out based on the ADDIE development model procedure. The animated video-based media on the topic of the water cycle for grade IV elementary school that was developed has gone through various development steps based on the development model procedure used, and has also passed the product validity test and improvement. The product validity test is carried out by assessing the product carried out by practitioners and experts in their fields, and tested on students ([Putu Unik Indrayani & Sumantri, 2021](#); [Rusdiana & Wulandari, 2022](#)). Referring to the results of product validity testing and improvements that have been implemented, animated video-based learning media were produced on the content of the water cycle topic of science that can be used in learning activities.

Clear and interactive visualization of the water cycle process through animated videos can help students understand abstract concepts related to the water cycle better. Presenting interesting and fun materials can increase students' interest and enthusiasm in learning this topic with the help of animations that adapt to the characteristics of fourth grade students by using teacher and student characters who explain the stages of the water cycle on earth using beach, river, and lake backgrounds. Students' conceptual understanding can be improved, because dynamic visualization makes it easier for them to construct knowledge about the stages of the water cycle. A more interesting and fun learning atmosphere is created by using animated videos, reducing boredom and encouraging active student involvement in the learning process ([Hamidi et al., 2023](#); [Wulandari et al., 2020](#)). In addition, clear visualization can help students remember and retain their understanding of the water cycle for a longer period of time, supporting more meaningful learning. Thus, the development of animated video-based learning media on the topic of the water cycle has specific advantages in improving conceptual understanding, interest and motivation to learn, quality of learning, and retention of student understanding.

The animated video-based learning media that has been created is said to be good and has advantages over the distributed learning videos. This refers to the value implemented by the material expert with the results of the developed media being valid, with the overall percentage of subjects getting a score of 95.5 in the very good category. The animated video-based learning media is delivered in a clear, interesting way, and in accordance with the characteristics of the students, because it can show in real terms how the stages of the water cycle process are ([Waruwu & Sitingjak, 2022](#); [Wulandari et al., 2020](#)). The objectives that have been conveyed in the animated video-based learning media have been based on learning achievements. Then, the material presented has been presented in an interesting and clear manner so that it is in line with the teaching and learning objectives to arouse students' enthusiasm and interest in learning. Presenting topics that are presented well can help students when forming an understanding of the concepts taught, therefore learning activities will be more meaningful ([Novitasari et al., 2023](#); [Sudiarta & Sandra, 2016](#)).

The assessment by two media experts, obtained the findings of the media results developed are valid with the overall percentage of subjects getting a score of 92% and entering the very good category. The clarity of text and sound in the video media is presented well and accompanied by music to raise enthusiasm but without eliminating the talent's voice so that the learning video is able to focus the attention of students so that they are enthusiastic about hearing and listening to the material being explained in the video. Clarity of text and sound is the most important component in a learning video because when the sound and clear display are able to focus the mind and attract the attention of students with the material being taught.

Based on the assessment by 22 students, the findings of the developed media are valid with the overall percentage of subjects getting a score of 96.9% and entering the very good category. This very good category was obtained because from the learning and material aspects and the use of language, the animated video-based learning media has been packaged as attractively as possible by using animated teacher characters. In terms of media quality and media display, it has a good and clear display so that it can arouse students' interest and learning.

From the advantages of animated video-based learning media that have been explained and tested by experts, it can be concluded that the animated video-based video media that has been created has very good validity so that it can be said to be suitable for distribution to social media. The presentation of topics that are presented well can help students when forming an understanding of the concepts being taught, therefore learning activities will be more meaningful. Animated video-based learning media on the science content of the water cycle topic that is developed can support the learning process because students can see, hear and observe the material being learned. This is based on the characteristics of elementary school students with an age range of 7-11 years or at the concrete operational stage, so that students' way of thinking has begun to be stable and logical (Arnidah, A., Anwar, CR, & Hasfat, 2020; Sudiarta & Sandra, 2016). Animated video-based learning media is in line with cognitive learning theory that emphasizes the process rather than the results of learning. The use of learning media according to student characteristics is used as a learning stimulus that arouses curiosity, student learning motivation, so that learning objectives can be achieved. Animated video-based learning media students can observe and listen to learning materials delivered with animations that show in real terms how the water cycle occurs in the surrounding environment. This can make it easier for students to understand the material because they see it directly in teaching and learning activities (Ponza et al., 2018; Puspita & Raida, 2021).

This study has several limitations, one of which is the focus of the material which is only limited to the topic of the water cycle. In addition, this study only involved research subjects from one elementary school, namely SD Negeri 2 Tianyar, so the results may not be fully generalizable to other school contexts with different student characteristics. In addition, this study uses the Powtoon application which may have limitations in the animation features and duration of the resulting video. The advantage of this study lies in the use of a systematic ADDIE model, so that each stage of the development of animated video-based learning media is carried out carefully and structured. The validity of the media developed has also been tested by experts and practitioners, and has received positive responses from students, indicating that this media is effective and suitable for use in learning. In addition, the resulting animated video has an attractive appearance and is in accordance with the characteristics of students, so that it can increase their interest and motivation to learn.

4. CONCLUSION

This study confirms that animated video-based learning media on the topic of the water cycle for fourth grade elementary school students is effective and feasible to use. The development of this media follows the systematic ADDIE model, ensuring that each step is carried out carefully and structured. The results of expert validation and positive responses from students indicate that this animated video increases students' interest and understanding, making the learning process more interesting and interactive. Although this study is limited to one school and the topic of the water cycle, the advantages of this approach provide a strong foundation for further development and implementation in various educational contexts. Thus, this animated video-based learning media is expected to be widely used to improve the quality of learning in the classroom.

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