EFFECTIVENESS OF ANIMATED VIDEO LEARNING MEDIA ON SCIENCE LEARNING OUTCOMES OF ELEMENTARY SCHOOL STUDENTS

Dimas Qondias[1], Dominika Elviana Kale[2], Elisabeth Susanti Tawa [3], Elisabeth Tantiana Ngura[4], Veronika Owa Mere[5]*

[1] *Elementary School Teacher Education, Citra Bakti College of Education, Indonesia, dimdimqondias@gmail.com*
[2] *Elementary School Teacher Education, Citra Bakti College of Education, Indonesia, elvinkale069@gmail.com*
[3] *Elementary School Teacher Education, Citra Bakti College of Education, Indonesia, ichatawa8@gmail.com*
[4] *Early Childhood Education, Citra Bakti College of Education, Indonesia, elisabethngura@gmail.com*
[5] *Early Childhood Education, Citra Bakti College of Education, Indonesia, veronikaowamere@gmail.com*

ABSTRACT

This study aims to examine the utilization of video media, specifically the effectiveness of animation media in improving science learning outcomes. The research method used in this article is qualitative descriptive research, where data is collected through literature reviews. The literature used in this research includes scientific articles related to the effectiveness of animated video learning media in enhancing the science learning outcomes of elementary school students. Data collection was conducted by searching for articles from national and international journals related to the research topic published between 2020 to 2024. This study identified 10 articles that align with the research focus, demonstrating the effectiveness of animated video learning media in improving science learning outcomes for elementary school students. Animated videos in science learning have been developed according to student needs, and currently, the effectiveness of animated videos yields positive results in supporting learning. Animated videos can increase student engagement and provide a more enjoyable learning experience. Therefore, the integration of animated videos into the learning process is an important step to support innovative and effective educational development.

Keywords: Learning Media, Animated Videos, Science Learning Outcomes, Elementary School

INTRODUCTION

In education, learning media are essential tools for delivering messages or information from the source to the receiver. Learning media include everything used to convey materials from teachers to students, making the learning process more effective, engaging, and easier to understand (Rachman, 2022). These media stimulate students' thoughts, feelings, and attention during classroom learning, serving as sensory tools or instructional materials (Fitria, 2021). Broadly, learning media can be physical or software-based resources that enhance students' interest and focus, helping them comprehend the material presented and motivating them to keep learning (Ismail et al., 2021).

Learning media can be categorized by physical form and use, such as

print, audio, visual, audiovisual, and electronic media. In this era of globalization and technological advancement, education is transforming significantly, with audiovisual media emerging as particularly effective in capturing students' attention and supporting independent learning. The use of audiovisual media in education has proven effective in enhancing students' understanding and engagement (Ningsih, 2022). Audiovisual media combine sound and visuals to create a more memorable learning experience (Saputro et al., 2021). Audiovisual media offer students the opportunity to develop critical and analytical thinking skills and increase their motivation to learn. They also stimulate creativity and media literacy, helping students understand material through a more interactive approach (Qondias et al., 2023). By engaging directly with content, students can better understand abstract concepts and improve information retention (Serungke et al., 2023).

One widely used form of audiovisual media is animated videos. Animated videos use moving images to convey information or explain concepts, enhancing students' motivation and understanding of the material presented by teachers (Muna & Wardhana, 2021). These videos help teachers explain complex concepts in an engaging way, making classroom settings more appealing and supportive of students' comprehension (Adiati et al., 2023). Animated videos encourage students to actively participate, increasing both their understanding and retention (Ruswan et al., 2024). In modern education, animated videos hold significant potential to motivate and engage students, playing an essential role in achieving learning objectives (Qondias, 2017).

Animated videos can be used in social and natural sciences education, particularly in Science (IPA) lessons. Science is a discipline related to natural phenomena and objects, studied systematically, methodically, and universally, consisting of a collection of observations and experimental results. Science encompasses a wide range of life-related topics (Widyaningrum & Maryani, 2022). Science education in elementary schools provides a learning experience that increases students' knowledge of the natural environment through a scientific process that includes investigation, development, and testing of ideas (Qondias et al., 2023). Elementary science education is essential because it serves as a means to align with advancements in science and technology.

Elementary science education provides students with knowledge about their natural surroundings, gained through a series of scientific processes including investigation, idea organization, and testing (Qondias et.al, 2023). Science lessons in elementary school often lean more toward memorization than exploration, causing students to become easily bored, less active in sharing opinions, and less accurate in answering science questions (Jannah & Atmojo, 2022). One cause of this is the suboptimal use and innovation of learning media in schools. In response, some teachers are incorporating digital media, such as videos and PowerPoint presentations. Video media with sequential static images that move in sequence can guide students through the learning process and inspire them, making it especially suitable for elementary school education (Kasmini, 2023).

This study aims to evaluate the effectiveness of animated video media in improving the science learning outcomes of elementary school students. The focus is on understanding the impact of using animated videos on students' comprehension of science concepts, comparing the learning outcomes of students who use this media with those who learn through conventional methods, and analyzing the advantages and disadvantages of animated video media. Additionally, the study explores students' responses to animated videos in science education. The findings are expected to provide recommendations for teachers in selecting effective learning media to enhance student understanding and interest.

METHOD

The research method used is a qualitative descriptive method in which data is collected through a literature review. The literature used in this research includes scientific articles related to the effectiveness of animated video learning media in improving elementary school students' science learning outcomes. Data collection was carried out by browsing articles from electronic journals and other publications related to the topic, specifically from 2020 to 2024, using Google Scholar to strengthen the analysis results. The data analysis technique in this study consists of three stages: organizing, synthesizing, and identifying.

The reviewed journals meet the criteria of research articles with the theme of the effectiveness of animated video learning media in improving elementary school students' science learning outcomes. The literature search focused on the first keyword, "Animated Video Media," yielding 256 articles. From these 256 articles, through the three stages of organizing, synthesizing, and identifying, ten themes were identified that align with the literature review objectives. This literature review is synthesized using a narrative method by grouping similar extracted data to meet the research objectives.

RESULT AND DISCUSSION

The search yielded 10 articles included in the analysis stage. These articles were published over the last five years and focus on the effectiveness of animated video media in improving the science learning outcomes of elementary school students. The analysis of all these articles can be found in Table 1.

TABLE 1 | Result of the Article Review

No	Name	Title	Year	Journal name
1.	1. Nurhayati 2. Wayan Lasmawan 3. Ida Bagus Putu Arnyan 4. Made Candiasa	The Effectiveness of Animated Videos to Improve Science Process Skills and Creativity in Science Learning During Covid-19 Pandemic.	2022	International Journal of Health Science.
2.	1. Ruli Astuti 2. Nur Maslikhatun Nisak 3. Ainun Nadlif 4. Adea Wulan Hajatul Zamzani	Animated Video as A Media for Learning Science in Elementary School	2021	Journal of Physics: Conference Series
3.	M. Hanif	The Development And Effectiveness Of Motion Graphic Animation Videos To Improve Primary School Students' Sciences Learning Outcomes.	2022	International Journal of Instruction
4.	1. Nur Aulia 2. Suci Perwita Sari	The Effect of Animated Videos on Creativity In Science Learning of Class V Students About Changes In Objects In Elementary School 067256 Medan Marelan District Academic Year 2020-2021	2022	Journal of General Education Science

5.	1. Helena Cristine Paulina Marbun 2. Ainur Rosyd	The Effectiveness Of 3D Animation Video Media on Science Learning Interests of Class III Students.	2023	Formosa Journal of Sustainable Research
6.	1. Tri Ajeng Rahmawati 2. Zainul Arifin Imam Supardi 3. Eko Hariyono	Pengembengan Media Pembelajaran Interaktif Berbasis Video dengan Model POE (Predist Observe Explain) untuk Melatihkan Keterampilan Proses IPA Siswa Sekolah Dasar	2022	Jurnal Basicedu
7.	1. Ade Putra 2. Abdullah Amir Hamza Hasibuan 3. Agung Setiawan 4. Sri Wahyudi	Pengembangan Media Video Animasi Pada Pembelajaran Ipa Kelas V SDN 001 Pagaran Tapah Darussalam	2024	Jurnal Rekayasa Sistem Informasi dan Teknologi
8.	1. Irma Sri Dewi Siregar 2. Mawar Sari	Pengembangan Video Animasi Untuk Motivasi Belajar Siswa Dalam Pembelajaran IPA Kelas IV SD Mumahamadiyah 03 Medan	2022	Jurnal Basicedu
9.	1. Abnah Hidayati 2. Zelhendri Zen 3. Nofri Hendri	Development of Animation-Based Learning Videos for Science and Technology Subjects in Class IV Elementary School	2023	Jurnal Pendidikan Mandala
10.	1. Shintia Putri Kristiari 2. Fajar Cahyadi	Pengembangan Media Video Animasi Pembelajaran IPA Materi Perubahan Cuaca untuk Meningkatkan Hasil Belajar Siswa Berbasis Canva Pendidikan	2023	Jurnal Dimensi Pendidikan dan Pembelajaran

In the first article, the focus is on the effectiveness of animated videos in enhancing students' science process skills and creativity during science lessons amid the COVID-19 pandemic. The objective of this research is to determine how effective the use of animated videos is in improving these skills. The study employs a development research approach and involves 60 fifth-grade students from SD Negeri 4 Pringgabaya as test subjects. Data is collected using questionnaires and analyzed with a quantitative descriptive approach. The results indicate that the animated videos used in science learning are effective, categorized as good to excellent. This is evidenced by the effectiveness test percentage of each video reaching a score of five, demonstrating that the animated videos effectively enhance students' science process skills and creativity.

The second article discusses the development and implementation of animated videos as a learning medium for science education in elementary schools, specifically at MI Walisongo Gempol Pasuruan. This research focuses on developing animated videos about the characteristics of materials and the states of matter for third-grade students. The study adopts a Research and Development (R&D) approach with a design adapted from the ADDIE model. The findings show that the developed animated videos are valid and effective for use in science learning in the third grade. Validation is performed by experts (media, design, and content) and students through questionnaires. The results indicate that the animated videos are highly valid, with scores of 87.5% from media experts, 90% from content experts, and 82.5% from design experts. Media testing also reveals that the animated videos are effective, with a score of 93.76% from students. After implementation in lessons, 85% of students met the minimum competency standards, while 15% did not. The study concludes that animated videos are suitable for teaching the properties

of materials and changes in states of matter. They have been shown to improve student learning outcomes and encourage critical thinking in science education.

The third article focuses on the development and effectiveness of motion graphic animated videos in enhancing the science learning outcomes of elementary school students. This study employs a sequential exploratory mixed-methods approach, combining qualitative descriptive methods to analyze the situation and product development process with experimental methods involving 27 fifth-grade students in both control and experimental groups. The objective is to ascertain the development and effectiveness of motion graphic video media in elementary science education. The results indicate that motion graphic videos are effective in improving science learning outcomes. Students find it easy to understand and develop new knowledge, as the material connects to foundational knowledge and everyday life.

In the fourth article, the discussion revolves around the influence of animated videos on the creativity of fifth-grade students in science learning concerning the changes in matter. The objective of this research is to determine whether the use of animated video media can enhance students' creativity. This study employs an experimental design with a quantitative approach. The population and sample consist of fifth-grade students from SDN 067256 in the Medan Marelan district, with 30 students in the control class and 30 students in the experimental class. The results indicate a significant effect of animated videos on students' creativity in science learning. This is evidenced by the post-test results showing that the average score of the experimental class (96.23) is higher than that of the control class (70.73), with a difference of 25.86. The t-test shows a t-value of 17.515 with a significance level of 0.000, which is greater than the t-table value (1.671) and a significance value less than 0.05 ($0.000 < 0.05$).

The fifth article discusses the effectiveness of 3D animated video media in increasing the learning interest of third-grade students at SDN Grogol 05. The study aims to determine whether the use of 3D animated video media can make third-grade students more interested in learning science. This research employs a quantitative experimental method, comparing two groups of students: one group that uses 3D animated video media and another group that does not. Data is collected using questionnaires to measure students' learning interest. The findings show that students using 3D animated video media have a higher interest in learning compared to those who do not use it. The average interest score for the class using 3D animated video media is 93.14, while the average interest score for the control class is 83.04. This difference is significant, with a significance value of $0.000 < 0.05$, indicating that the use of 3D animated video media positively affects students' learning interest.

The sixth article discusses the development of interactive video-based learning media using the POE (Predict-Observe-Explain) model to enhance the science process skills of elementary school students. This research aims to evaluate the effectiveness of learning media in conveying learning content and training students' science process skills. The study adopts a Research and Development method with a 4D (Four-D) development model, consisting of four stages: Define, Design, Develop, and Disseminate. The results indicate that the learning media integrated with the POE model is effective in training the science process skills of fourth-grade students. The learning media is deemed valid, practical, and effective. Validation is based on assessments of the text, audio, and usability of the media. The practicality of the media is evaluated based on student enthusiasm for learning, increased motivation, and the media's ability to help students understand the material. The effectiveness of the media is assessed based on its ability to help students meet minimum competency standards and enhance their science process skills. Overall, this research shows that interactive video-based learning media using the POE model can serve as an effective tool for training elementary school students'

science process skills.

In the seventh article, the focus is on the development of animated video media for fifth-grade science learning at SDN 001 Pagaran Tapah Darussalam. The purpose of this research is to develop animated video media for the topic of temperature and heat for fifth-grade elementary students and to assess the feasibility of the animation media in science education. This study utilizes Research & Development (R&D) methods employing the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The results indicate that the learning media, validated by three experts, received an average percentage score of 92%, categorizing it as very valid for use in education. Teacher and student responses, as reflected in limited trial questionnaires, showed a 100% approval rate, categorized as very valid, while the teacher's questionnaire yielded a score of 96%. The results of the final trial showed a percentage of 96.8%, also categorized as very valid, with the teacher's questionnaire achieving a 100% score. Based on these findings, the animated video learning media based on Canva for the topics of temperature and heat in fifth-grade elementary education is deemed very valid for implementation.

In the eighth article, the discussion centers around the development of animated videos aimed at motivating students in fourth-grade science learning at SD Muhammadiyah 03 Medan. The objective of this research is to determine the feasibility of teaching science to students at SD Muhammadiyah 03 Medan using animated films and to enhance their learning enthusiasm. This study follows a Research and Development (R&D) model with an ADDIE design; the completed stages include analysis, design, development, implementation, and evaluation. Utilizing a quantitative approach, the research develops an animation that motivates children to learn science. Data collection techniques include non-test methods such as observation, interviews, questionnaires, and documentation of research conclusions. The results indicate that the animation motivates students to learn about forces and motion in science classes, receiving a very good rating. The content of the animated video is suitable for use in the educational process, ensuring that all learning issues are adequately addressed. The use of animated films in classrooms is recommended for all instructors to enhance students' learning motivation.

In the ninth article, the focus is on the development of animated-based science and technology learning videos for fourth-grade subjects. The goal is to create valid, user-friendly, and effective educational media that improves student learning outcomes. This research employs a Research and Development (R&D) method with the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The educational video is tested by experts (one content expert and two media experts) to ensure its validity. Subsequently, 22 fourth-grade students from SD Negeri 26 Air Tawar Timur evaluate the practicality of using the learning video. Finally, pre-test and post-test scores are utilized to measure the media's effectiveness. The results reveal that the developed learning video is valid, practical, and effective. Validity testing by content experts yields a score of 4.93, indicating that the learning video is highly valid. Practicality testing shows that the learning video is easy for students to use and comprehend. Effectiveness testing using the Wilcoxon signed-rank test indicates a significant improvement in students' learning outcomes after using the educational video.

In the tenth article, the research focuses on developing animated learning videos for science, specifically on the topic of weather changes, to enhance learning outcomes for third-grade students. This study employs the Canva Education application to create interactive educational videos. The primary objective is to produce effective and feasible learning videos for thematic science education concerning weather changes. This research follows a Research and Development (R&D) method using the Dick and Carey model, which consists of nine steps. Nineteen third-grade students participate in the

study. To assess the effectiveness and feasibility of the educational videos, the researcher utilizes various tools, including validation sheets for experts (in content, media, language, and teaching), pre-study and post-study sheets for students, as well as response questionnaires for teachers and students. Data is collected through interviews, questionnaires, and documentation. The results indicate that the interactive learning videos based on Canva Education for the topic of weather changes are categorized as "Very Good" or "Highly Feasible" for use as science teaching media, based on evaluations conducted by classroom teachers.

Various studies indicate a positive and significant impact of using animated video media to enhance science learning outcomes in elementary schools. Animated videos in science education facilitate the visualization of complex concepts, such as the solar system, the water cycle, or the process of photosynthesis, in a way that is easily comprehensible for students (Dinatha et al., 2023). Animation can illustrate processes that are not directly observable or those that occur too quickly or slowly for the naked eye, thus deepening students' understanding. The use of color, sound, and movement in animated videos also engages students more actively in the learning process, enhancing their focus and interest in the material being taught (Nurhayati & Qondias, 2023).

The packaging of animated video media for science learning in elementary schools should be based on students' learning needs while considering local elements in their environment. For example, when visualizing the process of a seed growing into a large tree, it’s important to depict a tree common in the students' surroundings to help motivate them to learn. Various aspects of the media, such as music, storyline, duration, reflective statements, and conclusions in the animated video, should be carefully considered to strengthen the information and make the developed animated video a valuable source of knowledge.

CONCLUSION

The use of animated videos in science education has rapidly developed alongside advances in educational technology. Animated videos have been implemented due to their engaging and interactive visual capabilities, making abstract science concepts easier for students to understand. Through animation, processes that are difficult to observe directly, such as the water cycle or photosynthesis, can be clearly visualized. In recent years, numerous studies have shown that animated videos can enhance student interest, conceptual understanding, and learning outcomes. The studies conducted thus far are limited to the application of animated videos for science learning outcomes in elementary schools. Therefore, further research is needed on the use of animated videos to improve and enhance the quality of education.

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