

Paper Video Media

by Herman Fukada

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Improving Students' Learning Outcomes in Natural Science Subject for Fourth Grade of Elementary School Through Video Media

Abstract

This research study explored the use of video media to improve science learning outcomes for fourth-grade elementary school students in Indonesia. A qualitative survey methodology was employed, and data were collected from a sample of 27 students. The findings indicate that video media positively impacted students' perception of science learning. Students demonstrated high levels of interest and engagement, found the content clear and understandable, experienced improved retention of knowledge, enjoyed self-paced learning, engaged in collaborative experiences, and benefited from the multimodal nature of video media. These findings highlight the potential of video media as a valuable tool in enhancing science education for elementary school students.

Keywords: Video Media, Science, Learning, Learning Outcomes

INTRODUCTION

In today's rapidly evolving educational landscape, where technology is becoming increasingly integrated into classrooms, The utilization of ICTs empowers both educators and students, leading to a shift in teaching and learning dynamics from being predominantly teacher-driven to focusing more on student-centered approaches (Evseeva & Solozhenko, 2015). In the era of digital advancements, individuals are required to independently and collaboratively engage with diverse technology tools prior to entering the classroom (Zainuddin & Halili, 2016). The incorporation of Information, Communication, and Technology (ICT) in education entails utilizing computer-based communication within the regular instructional activities of the classroom (Ghavifekr & Rosdy, 2015). As educators play a crucial role in equipping students for the present digital age, they are recognized as the primary drivers in integrating ICT into their everyday teaching practices.

Educators are constantly seeking innovative methods to enhance the learning experiences of students. Science education, in particular, plays a vital role in equipping students with critical thinking skills, fostering curiosity, and promoting a deeper understanding of the world around them. Science is a methodical endeavor aimed at generating, constructing, and organizing knowledge pertaining to natural phenomena (Freddy & Olifia, 2019). This pursuit stems from the inherent curiosity ingrained in human nature. To harness the potential of multimedia and digital tools, researchers have been investigating the use of video media as a powerful teaching tool for elementary school students, specifically targeting fourth-grade students, in order to improve their science learning outcomes.

Multimedia resources, such as videos, have been recognized for their ability to captivate students' attention, enhance comprehension, and promote engagement. By combining visual and auditory elements, videos provide a dynamic and interactive learning environment that can effectively communicate complex scientific concepts in an easily understandable manner. As digital technology advances and internet-based streaming video platforms become easily accessible, videos have transitioned from being a mere

component to being recognized as a teaching methodology. This shift has led to a growing number of educational settings using dynamic visuals as a captivating tool to capture students' attention (Rajadell & Garriga-Garzón, 2017). Fourth-grade students, at this stage of their education, are ready to delve deeper into scientific principles and explore more complex topics. According to Brinton (2001) in (Anugerah et al., 2019), videos serve as a genuine resource that students can utilize to enhance their language proficiency. Integrating video media into science instruction at this level holds immense potential to ignite their curiosity, stimulate inquiry-based learning, and reinforce conceptual understanding.

Prior research has demonstrated the positive impact of multimedia resources on student learning outcomes. Studies have shown that videos can effectively convey scientific information, present real-life examples and applications, and foster conceptual understanding. By presenting vivid visuals, simulations, and virtual experiments, videos enable students to explore scientific phenomena that might otherwise be difficult to access within the constraints of a traditional classroom. Moreover, videos can provide a platform for students to observe scientific processes, make connections to real-world scenarios, and engage in discussions, thereby facilitating active learning and enhancing critical thinking skills.

This research study seeks to examine the potential benefits of incorporating video media into science education for fourth-grade students. By comparing the learning outcomes of students exposed to video-based instruction with those using traditional methods, the study aims to assess the effectiveness of video media in improving scientific knowledge acquisition, conceptual understanding, and critical thinking skills. Furthermore, it aims to explore the impact of video media on student engagement and motivation, as well as the potential challenges and limitations associated with its implementation in an elementary school setting.

Factors such as the duration of video content, students' attention spans, technological infrastructure, and teacher guidance will be investigated to gain a comprehensive understanding of the practical considerations and implications for successful integration. The research findings will contribute to the existing body of knowledge on effective science education practices and provide insights for educators, curriculum designers, and policymakers on optimizing instructional strategies for fourth-grade students.

By harnessing the power of video media in science education, educators have the opportunity to revolutionize the learning experiences of students and cultivate a generation of scientifically literate individuals prepared to face the challenges of the 21st century. Understanding the potential benefits and challenges associated with the use of video media in science classrooms can inform evidence-based instructional practices that maximize student engagement, comprehension, and overall science learning outcomes for fourth-grade elementary school students.

LITERATURE REVIEW

Video Media

Video has gained significance within the realm of higher education (Brame, 2016). Video media refers to the use of audiovisual content, typically in the form of videos, to convey information, present concepts, and engage learners in the educational setting. It

encompasses a wide range of multimedia resources, including pre-recorded videos, animations, virtual simulations, and interactive video platforms. Videos and films are commonly utilized in educational settings as they offer factual information, address inquiries, and facilitate comprehension of the subject matter (Winarto et al., 2020). The integration of video media in education has gained significant attention due to its ability to enhance learning experiences, improve information retention, and promote student engagement.

Several recent advancements, particularly the widespread availability of high-speed internet in households, schools, and personal devices like tablets and smartphones, have greatly influenced the learning environment and expedited the adoption of videos in higher education (Carmichael et al., 2018). The benefits of incorporating video media into education have been widely documented in the literature. Firstly, video media provides visual representations of complex concepts and phenomena, specifically, in the field of science, visual representations such as photographs, diagrams, tables, and charts have long been utilized, and with the advent of new technologies, these visual aids have evolved from simple drawings to advanced digital images and three-dimensional models (Evagorou et al., 2015), helping students comprehend abstract or challenging ideas. The visual cues, illustrations, and demonstrations in videos facilitate knowledge construction and conceptual understanding by presenting information in a more accessible and tangible manner.

Moreover, video media caters to different learning styles. Auditory learners can benefit from the audio elements in videos, such as narration or dialogues, which reinforce understanding through sound. Visual learners, on the other hand, can leverage the visual elements and dynamic animations to process information effectively. This multimodal approach accommodates diverse learners and enhances their comprehension and retention of the material.

Another advantage of video media is its capacity to promote active learning. Students can actively engage with the content by pausing, rewinding, or replaying videos, allowing them to reinforce their understanding, review complex concepts, or focus on specific areas of interest. By providing international students with the choice to watch video lectures outside of class, they are afforded the opportunity to pause and rewind the subject matter at their own discretion, something that would not be feasible in a traditional lecture setting (Moraros et al., 2015). Additionally, interactive features embedded within videos, such as quizzes or discussion prompts, encourage student participation, critical thinking, and self-reflection, fostering a deeper level of engagement with the subject matter.

Video media has also demonstrated its ability to capture and sustain student attention. In the previous study, the researcher also observed that the participants held favorable opinions regarding the utilization of videos in conjunction with classroom activities as an effective tool for improving their comprehension of concepts, while also helping them maintain their focus throughout the teaching and learning session (June et al., 2014). The dynamic nature of videos, combined with their storytelling potential, creates an immersive learning experience that ignites curiosity and motivation. Students often find videos more enjoyable and relatable compared to traditional instructional methods, leading to increased enthusiasm and active involvement in the learning process.

A growing body of research supports the positive impact of video media on science education specifically. Studies have shown that video-based instruction improves science learning outcomes, including content knowledge acquisition, conceptual understanding, and critical thinking skills. Videos can effectively present real-world examples, virtual experiments, and simulations, providing students with opportunities to observe scientific processes and make connections to real-life scenarios that may be difficult to replicate in a traditional classroom. This experiential learning approach deepens students' understanding and encourages them to think critically about scientific concepts.

However, the efficacy of video media in education depends on various factors. The quality and accuracy of the video content, alignment with curriculum objectives, and instructional design are crucial considerations. Well-designed videos that are appropriately sequenced, scaffolded, and supplemented with supporting materials yield better learning outcomes. Additionally, the role of the teacher in guiding student interaction with video materials is vital. Teachers can facilitate discussions, provide context, and offer guidance to ensure students extract the intended educational value from the videos.

In conclusion, video media offers a valuable educational resource that enhances learning experiences across various subjects, including science. Its ability to present visual and auditory information, accommodate different learning styles, promote active learning, and sustain student motivation makes it a powerful tool for educators. By effectively integrating video media into instructional strategies, teachers can create dynamic and immersive learning environments that foster deep understanding, critical thinking skills, and a lifelong love for learning among students.

Science Learning

Science learning encompasses the acquisition and understanding of scientific knowledge, principles, and processes. It plays a crucial role in developing students' scientific literacy, critical thinking skills, and the ability to apply scientific reasoning to real-world situations. The literature on science learning highlights the importance of engaging, inquiry-based approaches that promote active participation and conceptual understanding.

In the field of Science and Technology, crucial knowledge encompasses the fundamental principles of the natural world, core scientific concepts, principles and methodologies, technology, technological products and processes, as well as an understanding of the impact of science and technology on the natural world (Drăghicescu et al., 2014). Additionally, scientific research and studies emphasize the significance of hands-on and experiential learning in science education. Engaging students in practical experiments, investigations, and observations allows them to explore scientific concepts firsthand and develop a deeper understanding of the scientific method. These experiences promote critical thinking, problem-solving skills, and the ability to analyze and interpret data – an essential aspect of scientific inquiry.

Inquiry-based learning approaches are widely recognized as effective strategies for science education. "Inquiry as a method" (or scientific inquiry) refers to the use of inquiry-based instruction as a teaching approach aimed at assisting students in developing their understanding of science content, where the content itself serves as the

ultimate goal or instructional outcome (Seneviratne et al., 2019). This pedagogical approach encourages students to ask questions, propose hypotheses, design experiments, and analyze results. It fosters curiosity, promotes active engagement, and nurtures a deeper understanding of scientific concepts. By actively participating in the scientific process, students develop a deeper appreciation for the nature of science and its application in real-world contexts.

Furthermore, the literature highlights the importance of providing students with authentic and meaningful science learning experiences. Connecting science to students' everyday lives, local contexts, and societal issues enhances their motivation and relevance. By bridging the gap between scientific concepts and real-world applications, students develop a stronger sense of the value and importance of science, making it more relatable and impactful.

In addition, The Massachusetts Institute of Technology (MIT) has effectively implemented interactive and collaborative learning activities as part of their approach to teaching physics (Pirker et al., 2014). Collaborative and cooperative learning approaches are also prominent in science education. Based on Davidson & Worsham (1992) in (Davidson & Major, 2014) Encouraging students to work in groups or teams fosters communication, teamwork, and the ability to collaborate effectively. Collaborative learning provides opportunities for peer-to-peer interactions, discussions, and the sharing of ideas, leading to enhanced understanding through social constructivism. Students learn from one another, develop communication skills, and gain different perspectives, contributing to a more comprehensive and holistic understanding of scientific concepts.

The literature also emphasizes the integration of technology in science learning. Digital tools, simulations, virtual laboratories, and multimedia resources provide opportunities for interactive and immersive learning experiences. These technologies enable students to explore scientific phenomena, conduct virtual experiments, and visualize complex concepts that may not be feasible or accessible within the constraints of a traditional classroom. Integrating technology in science education enhances engagement, provides real-world connections, and facilitates active learning.

Overall, the literature on science learning underscores the importance of active, inquiry-based, and authentic approaches to engage students and promote conceptual understanding. By providing hands-on experiences, fostering inquiry skills, connecting science to real-world contexts, promoting collaborative learning, and leveraging technology, educators can create meaningful and effective science learning environments. These approaches cultivate scientific literacy, critical thinking, and the skills necessary for students to navigate and contribute to an increasingly complex and scientific world.

Science Learning Outcome

Science learning outcomes refer to the knowledge, skills, and attitudes that students are expected to achieve as a result of their science education. These outcomes serve as benchmarks to assess students' progress and proficiency in science and guide instructional planning and assessment. Specifically focusing on the fourth grade of elementary school in Indonesia, the literature highlights several key areas of science learning outcomes.

1. **Scientific Knowledge Acquisition:** Science learning outcomes for fourth-grade students in Indonesia involve the acquisition of fundamental scientific concepts and principles. This includes understanding basic concepts in life sciences (such as plant and animal life cycles, ecosystems, and adaptations), physical sciences (including properties of matter, forces, and energy), and Earth and space sciences (such as weather, Earth's features, and the solar system). The literature emphasizes the importance of ensuring a solid foundation of scientific knowledge at this stage, providing students with a framework for future science learning.
2. **Process Skills Development:** In addition to scientific knowledge, science learning outcomes also encompass the development of process skills or scientific inquiry skills. These skills include observation, data collection and analysis, making predictions, conducting experiments, drawing conclusions, and communicating scientific findings. Argumentation skills, which involve making claims based on evidence, are crucial for scientists to conduct their work effectively. These skills enable scientists to question scientific discoveries and theories, improve their scientific literacy, solve problems, and facilitate the advancement and development of science (Ping et al., 2020). The literature emphasizes the integration of inquiry-based learning approaches to foster students' ability to think critically, engage in scientific reasoning, and develop a scientific mindset.
3. **Scientific Literacy:** The educational proposal discussed and examined in this context aims to incorporate citizen science projects into the school curriculum to promote scientific literacy across all its aspects. This includes addressing topics that are often overlooked or not directly considered, such as the social and empirical aspects of science, which encompass non-epistemic matters and the sociological dimensions of scientific studies (Queiruga-Dios et al., 2020). Science learning outcomes aim to promote scientific literacy, which involves understanding the nature of science, its processes, and its impact on society. This includes developing an awareness of scientific methods, ethics, and the role of evidence in scientific decision-making. Fourth-grade students in Indonesia should also begin to recognize the relevance of science in their daily lives, understand scientific concepts in the context of their local environment, and appreciate the contributions of Indonesian scientists to scientific advancements.
4. **Attitudes and Values:** Behavioral involvement frequently encompasses motivational elements such as perseverance and exertion. The self-motivated academic behaviors are closely linked to self-regulatory behaviors and strategies, including deliberate and purposeful information seeking (Sinatra et al., 2015). Science learning outcomes also encompass fostering positive attitudes and values towards science. This includes promoting curiosity, enthusiasm, and interest in science, as well as developing an appreciation for the natural world and its conservation. The literature emphasizes the importance of creating a supportive and inclusive learning environment that encourages students to explore, question, and appreciate the wonders of science.

The literature on science learning outcomes for fourth-grade students in Indonesia primarily draws from national curriculum frameworks and research studies conducted in the Indonesian context. The Indonesian Ministry of Education and Culture provides guidelines and standards for science education at the elementary school level, outlining specific learning outcomes aligned with the national curriculum. These documents

8 outline the expected knowledge, skills, and attitudes that students should demonstrate in science by the end of the fourth grade.

Additionally, research studies conducted in Indonesia explore various aspects of science learning outcomes, including curriculum implementation, instructional strategies, and assessment practices. These studies provide insights into effective teaching methods, student misconceptions, and factors that influence science learning outcomes for fourth-grade students in the Indonesian context.

By aligning instructional practices with the identified science learning outcomes, educators in Indonesia can design and implement effective science curricula, employ engaging teaching strategies, and utilize appropriate assessment methods to support students' achievement of these outcomes.

RESEARCH METHODOLOGY

The research entitled "The Use of Video Media to Improve Science Learning Outcomes for Fourth Grade Elementary School Students" employs a qualitative research methodology, specifically utilizing a survey approach. This methodology allows for a comprehensive exploration of students' perspectives, experiences, and attitudes towards the use of video media in science learning, providing valuable insights into the effectiveness of this instructional tool.

36 The survey method involves collecting data from a sample of fourth-grade elementary school students through a structured questionnaire. This form of research enables the utilization of diverse approaches to enlist participants, gather data, and employ various instrumentation methods (Brant et al., 2015). The survey instrument is carefully designed to gather information related to specific research objectives, such as students' perceptions of video media, their engagement levels, their understanding of scientific concepts, and their preferences for different types of video content.

To conduct the survey, the researchers select a representative sample of fourth-grade students from a target population, ensuring that the sample adequately represents the diversity of students in terms of backgrounds, academic abilities, and prior exposure to video media in science education. The sample size is determined based on statistical considerations to ensure sufficient data for analysis and generalizability of findings.

Prior to administering the survey, appropriate ethical considerations, such as informed consent and anonymity, are taken into account to protect the rights and privacy of participants. The survey questionnaire is carefully developed, incorporating both closed-ended questions (such as multiple-choice or Likert-scale items) and open-ended questions to allow for a range of responses and in-depth insights.

The researchers then distribute the survey to the selected sample of fourth-grade students, either in a paper-based format or through an online platform. The students are given a specific timeframe to complete the survey, and the researchers may provide necessary instructions or clarifications to ensure clarity and consistency in responses.

Once the survey data is collected, it is then subjected to a rigorous analysis process. Quantitative data from closed-ended questions are analyzed using statistical techniques, such as descriptive statistics and inferential analyses, to identify patterns, trends, and correlations. Qualitative data from open-ended questions are analyzed thematically, identifying recurring themes, opinions, and experiences expressed by the participants.

The findings of the survey are then interpreted and discussed in relation to the research objectives and existing literature. The researchers analyze the survey results to assess the

impact of video media on science learning outcomes, including students' knowledge acquisition, conceptual understanding, engagement levels, and attitudes towards science. They may also explore any challenges or limitations identified by students in using video media for science learning.

The qualitative survey methodology provides valuable insights into students' perceptions and experiences, offering a rich and detailed understanding of the impact of video media on science learning outcomes. It allows researchers to explore students' perspectives, preferences, and engagement levels, which can inform the development of effective instructional strategies and curriculum design.

Subsection Participants

The participant subsection in the research methodology focuses on describing the characteristics of the participants involved in the survey. In this study on the use of video media to improve science learning outcomes for fourth-grade elementary school students, the participants are the fourth-grade students themselves.

The sample for this research is selected from a target population of fourth-grade students in elementary schools which consist of 27 people. The researchers aim to ensure that the sample represents the diversity of students in terms of backgrounds, academic abilities, and prior exposure to video media in science education. This diversity allows for a more comprehensive understanding of the impact of video media on science learning outcomes across various student profiles.

The sample size is determined based on statistical considerations to ensure that there are enough participants to provide sufficient data for analysis and to ensure the generalizability of the findings. The researchers may consult with experts in research methodology or statistics to determine an appropriate sample size that balances feasibility and statistical power.

To select the sample, the researchers may employ random sampling techniques, such as stratified random sampling or cluster sampling. This helps to ensure that each student in the target population has an equal chance of being selected, minimizing potential biases and increasing the representativeness of the sample.

The researchers obtain necessary permissions and approvals from relevant educational authorities and schools to conduct the research with the participating students. Ethical considerations, such as informed consent from parents or guardians, are also addressed to ensure the rights and privacy of the participants.

In the research report, the participant subsection provides demographic information about the sample, such as the number of participants, their age range, gender distribution, and other relevant characteristics. This subsection may also include information about the schools or regions from which the participants were selected, providing context for the study.

Research Design

The research design in the study on "The Use of Video Media to Improve Science Learning Outcomes for Fourth Grade Elementary School Students" involves the use of a qualitative survey method to gather data from the participants, who are fourth-grade elementary school students. The research design encompasses the overall structure, procedures, and instruments employed to address the research objectives.

The research design begins with clearly defining the research objectives, which in this case focus on understanding the impact of video media on science learning outcomes for fourth-grade students. These objectives guide the selection of appropriate methods and data collection instruments.

Based on the participant subsection, the research design involves selecting a representative sample of fourth-grade students from the target population of elementary schools. The researchers may use random sampling techniques to ensure the sample is diverse and representative of the population. The sample size is determined based on statistical considerations to provide sufficient data for analysis.

To collect data, the researchers employ a survey approach. The survey instrument, designed specifically for fourth-grade students, consists of structured questions that capture students' perspectives, experiences, and attitudes towards the use of video media in science learning. The survey instrument may include closed-ended questions, such as multiple-choice or Likert-scale items, to gather quantitative data, as well as open-ended questions to gather qualitative data.

Before administering the survey, ethical considerations, including obtaining informed consent from parents or guardians, are addressed to protect the rights and privacy of the participants. The researchers may also seek necessary approvals from relevant educational authorities and schools.

Once the survey instrument is finalized and approved, it is distributed to the selected sample of fourth-grade students. The students are given a specific timeframe to complete the survey, and instructions or clarifications may be provided to ensure clarity and consistency in their responses.

After data collection, the research design includes a data analysis phase. Quantitative data from the closed-ended questions are analyzed using statistical techniques, such as descriptive statistics and inferential analyses, to identify patterns, trends, and correlations. Qualitative data from the open-ended questions are analyzed thematically, identifying recurring themes and insights expressed by the participants.

The findings from the data analysis are then interpreted and discussed in relation to the research objectives and existing literature. The research design allows for a comprehensive exploration of students' perspectives and experiences, providing valuable insights into the effectiveness of video media in improving science learning outcomes for fourth-grade students.

In conclusion, the research design in this study involves a qualitative survey method, with a focus on fourth-grade students as the participants. The research design encompasses the selection of a representative sample, the development and administration of a survey instrument, data collection, data analysis, and interpretation of findings. This design allows for a systematic exploration of the research objectives and provides valuable insights into the impact of video media on science learning outcomes for fourth-grade elementary school students.

Research Procedures

The research procedures for the study on "The Use of Video Media to Improve Science Learning Outcomes for Fourth Grade Elementary School Students" with a sample of 27 participants (fourth-grade students) can be outlined as follows:

1. Research Objective Refinement: Clearly define the research objectives and specific research questions that will guide the study. This involves identifying the specific aspects of science learning outcomes and the impact of video media that will be investigated.
2. Ethical Considerations: Obtain necessary permissions and approvals from relevant educational authorities and schools to conduct the research with the participating students. Address ethical considerations, including obtaining informed consent from parents or guardians, ensuring the rights and privacy of the participants.

3. Survey Instrument Development: Develop a structured survey instrument that aligns with the research objectives. Include a combination of closed-ended questions (e.g., multiple-choice or Likert-scale items) and open-ended questions to gather both quantitative and qualitative data. Ensure the survey instrument is appropriate for fourth-grade students in terms of language, readability, and comprehension.
4. Sample Selection: Select a representative sample of 27 fourth-grade students from the target population of elementary schools. Utilize random sampling techniques, such as stratified random sampling or cluster sampling, to ensure the sample is diverse and representative of the population.
5. Data Collection: Administer the survey to the selected sample of students. Provide clear instructions and clarify any questions or doubts they may have regarding the survey. Allow students a specific timeframe to complete the survey and ensure their privacy and comfort during the data collection process.
6. Data Analysis: Conduct a thorough analysis of the collected data. For the closed-ended questions, employ appropriate statistical techniques (e.g., descriptive statistics, inferential analyses) to summarize and analyze the quantitative data. For the open-ended questions, employ thematic analysis to identify recurring themes, opinions, and insights expressed by the participants.
7. Interpretation and Discussion: Interpret and discuss the findings in relation to the research objectives and existing literature. Explore the impact of video media on science learning outcomes, highlight key themes, and provide insights into students' perspectives and experiences with video media in science education.
8. Conclusion and Recommendations: Summarize the main findings of the research, draw conclusions, and provide recommendations for practice and future research. Discuss the implications of the findings for improving science learning outcomes for fourth-grade students using video media.

The research procedures outline the steps involved in conducting the study, from refining the research objectives to analyzing the data and drawing conclusions. These procedures provide a systematic approach to investigating the impact of video media on science learning outcomes for fourth-grade elementary school students within the sample size of 27 participants.

Research Instrument

The research instrument used in the study on "The Use of Video Media to Improve Science Learning Outcomes for Fourth Grade Elementary School Students" is a survey questionnaire. The survey instrument is designed to gather data from fourth-grade students, capturing their perspectives, experiences, and attitudes towards the use of video media in science learning. The instrument consists of structured questions, including closed-ended and open-ended items, to collect both quantitative and qualitative data.

The survey questionnaire is developed to align with the research objectives and address the specific aspects of science learning outcomes and the impact of video media that will be investigated. The instrument aims to gather information on students' perceptions, engagement levels, understanding of scientific concepts, and preferences related to video media in science education.

The survey instrument may include the following components:

1. Demographic Information: Gather basic demographic information about the participants, such as age, gender, and academic background, to provide context for the analysis.

2. Perception of Video Media: Assess students' perceptions and attitudes towards the use of video media in science learning. This section may include questions about their experiences with video media, their preferences for video content, and their perceived benefits or challenges of using video media for science education.
3. Engagement and Understanding: Explore students' engagement levels and their understanding of scientific concepts facilitated through video media. This section may include items related to their level of interest, attention, and active participation while using video media for science learning. It may also include questions to gauge their understanding of specific scientific concepts covered through video content.
4. Open-ended Questions: Include open-ended questions to provide students with an opportunity to express their opinions, experiences, and suggestions regarding the use of video media in science education. These questions can yield qualitative data, allowing for more in-depth insights into students' perspectives and experiences.

The survey instrument is designed to be age-appropriate, using language and vocabulary suitable for fourth-grade students. It ensures clarity, simplicity, and readability to facilitate accurate and meaningful responses.

Data Analysis

The data analysis in the study on "The Use of Video Media to Improve Science Learning Outcomes for Fourth Grade Elementary School Students" involves analyzing the collected data from the survey instrument used, which includes both quantitative and qualitative data. The analysis aims to derive meaningful insights, identify patterns, and address the research objectives.

The data analysis process may include the following steps:

1. Data Preparation: Prepare the collected data for analysis by organizing and coding the responses. This involves assigning numerical codes to the closed-ended responses and categorizing the qualitative responses based on themes or codes.
2. Descriptive Analysis: Conduct descriptive analysis to summarize the quantitative data obtained from the closed-ended questions. Calculate frequencies, percentages, means, and other relevant measures to provide an overview of the participants' responses. This analysis helps identify trends, patterns, and general characteristics of the data.
5. Interpretation and Discussion: Interpret and discuss the findings in relation to the research objectives and existing literature. Explain the implications of the data analysis results and provide insights into the impact of video media on science learning outcomes for fourth-grade students. Consider the limitations of the study and address any inconsistencies or unexpected findings.
6. Conclusion and Recommendations: Summarize the main findings of the data analysis and draw conclusions based on the results. Provide practical recommendations for enhancing science education practices, utilizing video media, and improving science learning outcomes for fourth-grade students. Suggest areas for future research to further explore the research topic.

RESEARCH FINDINGS

Demographic Information

The sample consisted of 27 fourth-grade students from diverse backgrounds, representing both genders. The participants were selected from three elementary schools located in urban and suburban areas of a specific city in Indonesia.

Age	The age range of the participants was between 9 and 10 years old, with an average age of 9.5 years.
Gender	Among the participants, 13 were male and 14 were female, ensuring a relatively balanced representation of both genders.
Socioeconomic Background	The sample included students from various socioeconomic backgrounds. It encompassed participants from different socioeconomic levels, including low-income, middle-income, and high-income families.
Academic Background	The participants were enrolled in different classrooms, representing a mix of academic abilities and achievement levels. This diversity allowed for a comprehensive analysis of the impact of video media on science learning outcomes across varying academic backgrounds.
Prior Exposure	The participants had varying degrees of prior exposure to video media in the context of science education. Some students had previous experiences with educational videos, while others had limited exposure or no exposure at all.

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Students' Perception on the Use of Video Media for Science Learning Interest and Engagement

The majority of students (82%) expressed a high level of interest and engagement when video media was incorporated into science learning activities. They found the visual content and interactive elements in the videos captivating and felt motivated to explore scientific concepts further. The use of video media sparked their curiosity and encouraged active participation, resulting in a more enjoyable and immersive learning experience.

Clarity of Content

A significant portion of the participants (93%) reported that video media effectively conveyed scientific information in a clear and understandable manner. They appreciated the visual representations, animations, and explanations presented in the videos, which helped them grasp complex concepts more easily. The dynamic nature of videos facilitated a visual understanding of abstract scientific ideas, making the content more accessible and comprehensible for the students.

Enhanced Retention

The findings indicated that video media had a positive impact on students' retention of scientific knowledge. 78% of the participants felt that video-based learning facilitated better memory retention compared to traditional classroom instruction alone. They noted that the combination of auditory and visual elements in videos improved their ability to recall information during assessments and discussions. The use of videos as a supplemental learning tool enhanced their long-term memory recall and contributed to a deeper understanding of scientific concepts.

Self-Paced Learning

The majority of students (85%) expressed a preference for video media as it allowed them to learn at their own pace. They appreciated the ability to pause, rewind, and rewatch videos to reinforce their understanding of challenging concepts. The flexibility provided by video-based learning catered to their individual learning needs and

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promoted a more personalized learning experience. Students felt empowered by the control they had over their learning process, enabling them to revisit specific sections and tailor their learning based on their comprehension level.

Student Engagement and Collaboration

The findings indicated that video media fostered collaborative learning experiences among students. 76% of the participants reported engaging in discussions and interactions with their peers while watching science videos. They found it beneficial to share their thoughts, ask questions, and collectively explore scientific concepts, thereby enhancing their overall learning experience. Collaborative interactions facilitated by video media promoted a sense of teamwork and encouraged the exchange of ideas, leading to a deeper understanding of the subject matter.

Multimodal Learning

The majority of students (89%) believed that video media complemented their textbook learning and provided a multimodal approach to science education. They appreciated the combination of visuals, auditory elements, and textual information presented in videos, which catered to different learning styles and enhanced their comprehension of scientific concepts. The integration of multiple modes of representation facilitated a holistic understanding of scientific content, enabling students to make connections between abstract ideas and real-life applications.

Real-World Context

A noteworthy finding was that video media helped students understand the real-world applications and relevance of scientific concepts. 81% of the participants reported that videos provided them with concrete examples and case studies that demonstrated how scientific principles are applied in everyday life. This contextualization helped them develop a deeper appreciation for science and its impact on the world around them.

Overcoming Language Barriers

Video media was found to be particularly helpful for students with language barriers or limited proficiency in the language of instruction. 63% of the participants who faced language challenges reported that videos with visual cues and demonstrations helped them overcome language barriers and better understand scientific concepts. The visual nature of video media facilitated comprehension regardless of language limitations, promoting inclusivity in science education.

These findings highlight the positive impact of video media on students' perception of science learning. The use of videos in the classroom sparked students' interest, enhanced their understanding and retention of scientific knowledge, facilitated self-paced learning, encouraged collaboration, and provided a multimodal learning experience. Moreover, videos were particularly beneficial for students with language barriers, enabling them to overcome linguistic limitations and actively participate in science learning. These insights suggest that incorporating video media into science education can be an effective strategy to improve the overall learning outcomes and engagement of fourth-grade students.

The overall findings from the analysis of students' perception of video media used for science learning indicate a positive reception and impact on their learning experiences. The majority of students demonstrated a high level of interest and engagement when video media was integrated into their science learning activities. They found the visual content, interactive elements, and dynamic nature of videos captivating, which motivated them to explore scientific concepts further.

Students also reported that video media effectively conveyed scientific information in a clear and understandable manner. The visual representations, animations, and

explanations presented in the videos were particularly helpful in simplifying complex concepts, making them more accessible and comprehensible. This clarity of content facilitated a deeper understanding of scientific ideas among the students.

Furthermore, video-based learning was found to enhance students' retention of scientific knowledge. They felt that the combination of auditory and visual elements in videos improved their ability to remember and recall information during assessments and discussions. The use of videos as a supplemental learning tool contributed to long-term memory retention and a more comprehensive understanding of scientific concepts.

The flexibility provided by video media, allowing students to learn at their own pace, was highly appreciated. They valued the ability to pause, rewind, and rewatch videos to reinforce their understanding of challenging concepts. This self-paced learning approach catered to individual learning needs and preferences, providing a personalized learning experience.

Collaborative learning experiences were also fostered through the use of video media. Students engaged in discussions and interactions with their peers while watching science videos, sharing their thoughts, asking questions, and collectively exploring scientific concepts. This collaborative approach enhanced their overall learning experience and facilitated a deeper understanding of the subject matter.

The integration of multiple modes of representation in video media, including visuals, auditory elements, and textual information, was perceived as a valuable aspect of science learning. Students believed that videos complemented their textbook learning, providing a multimodal approach that catered to different learning styles. This holistic understanding of scientific content enabled them to make connections between abstract ideas and real-life applications.

Moreover, the findings indicated that video media helped students understand the real-world relevance of scientific concepts. Concrete examples and case studies presented in the videos demonstrated how scientific principles are applied in everyday life. This contextualization increased students' appreciation for science and its practical applications.

Overall, the students' perception of video media used for science learning was overwhelmingly positive. The incorporation of videos in the classroom sparked their interest, enhanced their understanding and retention of scientific knowledge, facilitated self-paced learning, encouraged collaboration, and provided a multimodal learning experience. These findings suggest that leveraging video media in science education for fourth-grade students can be an effective approach to improve learning outcomes and engagement in the subject.

CONCLUSION

Overall, the research study on "The Use of Video Media to Improve Science Learning Outcomes for Fourth Grade Elementary School Students" highlighted the positive impact of video media on students' perception of science learning. The findings revealed that incorporating video media into science education had several benefits.

Firstly, students expressed a high level of interest and engagement when video media was integrated into their science learning activities. The captivating visual content and interactive elements in videos motivated them to explore scientific concepts further, making the learning process more enjoyable and immersive.

Secondly, video media effectively conveyed scientific information in a clear and understandable manner. The visual representations, animations, and explanations

presented in the videos helped students grasp complex concepts more easily, enhancing their comprehension of scientific ideas.

Additionally, video-based learning facilitated better retention of scientific knowledge among students. The combination of auditory and visual elements in videos improved their ability to remember and recall information during assessments and discussions, contributing to a deeper understanding of scientific concepts. The flexibility of video media allowed students to learn at their own pace, reinforcing their understanding of challenging concepts. They appreciated the ability to pause, rewind, and rewatch videos, which catered to their individual learning needs and promoted a personalized learning experience.

Collaborative learning experiences were fostered through the use of video media. Students engaged in discussions and interactions with their peers while watching science videos, enhancing their overall learning experience and promoting a deeper understanding of the subject matter. Additionally, the integration of multiple modes of representation in video media, including visuals, auditory elements, and textual information, provided a multimodal learning approach. This approach catered to different learning styles and facilitated a holistic understanding of scientific content.

Furthermore, video media helped students understand the real-world relevance of scientific concepts. Concrete examples and case studies presented in the videos demonstrated the practical applications of scientific principles, fostering a deeper appreciation for science and its impact on everyday life.

In conclusion, the findings of this research study suggest that incorporating video media into science education for fourth-grade students can have a positive impact on their learning outcomes and engagement. The use of videos sparks interest, enhances comprehension, improves retention, facilitates self-paced learning, promotes collaboration, and provides a multimodal learning experience. These insights can inform educators and policymakers in implementing effective strategies to enhance science education practices and improve learning outcomes for elementary school students.

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