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Enhancing Elementary Students' Creativity and Understanding through Audio-Visual Learning Media

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(Received: 22 July 2025; Accepted: 22 September 2025; Published: 30 September 2025)

Abstract

The purpose of this research is to determine whether audio-visual-based learning media influence the creativity and understanding of fifth-grade students at SDN Mlajah 2 Bangkalan in the IPAS subject of human body process. This research uses a quantitative methodology with comprehension questions and questionnaires as research tools. 30 students from class V-A and 30 students from class V-B formed the sample, with a total of 60 students in this research. This research uses a saturated sampling strategy. The IBM SPSS v.21 statistical application for Windows, which includes analysis tools such as validity tests, reliability tests, homogeneity tests, normality tests, and independent sample T-tests, was used to process the data in this research. Based on the findings from the independent sample T-test used for hypothesis testing, learning creativity has a significant value of $0.000 < 0.05$, indicating that learning creativity is impacted by audio-visual learning media. The independent sample T-test on student understanding shows a significance value of $0.000 < 0.05$, indicating that audio-visual learning media affects student understanding in the IPAS subject in the fifth grade at SDN Mlajah 2 Bangkalan.

Keywords: Learning Media, Audio-Visual, Learning Creativity, Understanding Learning

1. Introduction

The main pillar in creating advanced and competitive human resources is education. Education is a strategic tool for improving the quality of life and shaping the character of future generations, not just a measure of a nation's development ([1]; [2]). A key component in analyzing and improving the education system is determining the quality of education, including students' academic achievement. The idea of inclusion becomes a vital pillar in this situation ([3]). Everyone has a fundamental right to high-quality education, regardless of their social, economic, cultural, or physical or mental circumstances ([4]). Significant changes have occurred in the field of education thanks to technological breakthroughs, particularly in terms of knowledge dissemination and learning accessibility ([5]. Its influence extends beyond the effectiveness of the learning process and encompasses a shift in the learning paradigm toward a more contextual and participatory approach ([6]). Learning strategies that prioritize creativity and conceptual knowledge are becoming increasingly relevant in this digital

age, especially when facing real-world problems. Therefore, incorporating technology into learning is not just a fleeting trend but an urgent educational need ([7]; [8]). Student creativity is an important indicator for achieving meaningful learning objectives. Beside being more flexible and inventive in problem-solving, creative students are also better able to adapt to change ([9]; [10]; [11]). Because children not only retain information but also make logical and critical connections between ideas, this creativity immediately leads to a deeper understanding of the material ([12]; [13]; [14]). This understanding makes learning more contextual and individual by allowing students to freely assess, process, and develop the material.

Learning media acts as a catalyst to facilitate digital-based learning, enhance student engagement, and improve learning effectiveness ([15]). When used correctly, this media can increase students' understanding of the subject matter and stimulate their curiosity, emotions, and critical thinking ([16]; [17]). To select and use media that is appropriate for students' characteristics and their learning objectives, teachers must use strategic assessment. Students can absorb knowledge better and achieve the best learning outcomes when they are exposed to material that is prepared contextually and relevantly ([18]). Video, animation, and interactive presentations are examples of audio-visual materials that have been proven to improve student understanding, especially in fifth grade, where learning is more tactile and visual ([19]). Students are better able to grasp abstract ideas when content is presented in an engaging and interactive way ([20]). This method is also consistent with constructivist theory, which states that learning occurs thru imagination, discovery, and contextual inquiry ([21]). Beside improving memory, the authentic stimulation from audio-visual media can inspire students' creativity and active engagement in the learning process ([22]).

The greatest obstacle faced by students, especially those at the elementary school level, in learning natural and social sciences (IPAS) is misconceptions in science education, especially regarding the topic of processes in the human body. This may happen because students are probably to misunderstand the IPAS material on processes in the human body if it is not presented in an effective manner, numerous components many elements requiring deep understanding ([23]). The understanding of pupils obtained from untrustworthy sources, including media or unofficial information not supported by scientific data, is considered to contribute to this problem ([24]). Another aspect is that students struggle to solve the problems they face due to imperfections in the educational process and system that must be followed by all teachers and students ([25]). Educational tasks follow a complex process where students choose the time and how the activities will be carried out ([26]). Thus, students' inability to master the material well is caused using poor teaching strategies ([27]; [28]). The problem can be solved through the implementation of student-centered and digital-based learning innovations such as audio-visual media ([29]; [30]).

Previous research has shown that using audio-visual content-based learning materials improves student learning outcomes. For example, research conducted by [31] on the use of audio-visual materials to teach the respiratory system in fifth-grade science class significantly increased student enthusiasm for learning. However, in-depth research on how this media enhances students' creativity and learning outcomes has not yet been conducted. Significant differences in average scores were shown between the experimental and control groups. Research by [32] indicates that audiovisual media in the form of animation can improve students' creative thinking capacity. However, this study does not detail how this media affects learning outcomes in general. [33] conducted another study showing the impact of audio-visual materials on science learning outcomes in elementary school, with t-test findings indicating a high level of significance. However, the main focus of this research is not student creativity. It is clear from these three studies that each only emphasizes one aspect of the potential of audio-visual media, such as learning outcomes, creativity, or learning interest, without comprehensively combining all three. Additionally, there is not much research that examines how audio-visual learning materials simultaneously affect students' creativity and understanding within

a single integrated research framework.

Students' understanding and creativity in learning IPAS in class V are still considered low, indicating a gap in the learning process observed in the field at SDN Mlajah 2 Bangkalan. It is highly likely that the current traditional teaching methodologies, which offer little opportunity for students to think creatively or make meaningful connections between ideas, are the cause of this low knowledge ([34]). Based on this gap, the aim of this research is to investigate in more detail how audio-visual learning media can be used to enhance students' creativity and understanding of IPAS content. Thru the use of audio-visual media, it is hoped that the quality of learning in class V at SDN Mlajah 2 Bangkalan will be significantly improved by integrating creativity, student understanding, and learning objectives into a unified technology-based learning strategy.

2. Methods

The quantitative technique used in this study focuses on collecting and evaluating numerical data that has been validated and tested for reliability to determine how independent and dependent variables are related ([35]). With this approach, the impact of using audio-visual-based teaching materials on the creativity and understanding of fifth-grade IPAS students at SDN Mlajah 2 Bangkalan will be thoroughly examined. The true-experimental research approach using the pretest-posttest control group design model was applied in this study because, although subjects were not randomly assigned, this approach allowed the researcher to assess how the treatment of using audio-visual media could influence certain factors.

The study population consisted of two 5th-grade classes, each with 30 students, resulting in a total sample size of 60 students. One class was assigned to the experimental group, which received therapy in the form of audio-visual media-based learning, while the other class was assigned to the control group, which received traditional instruction. This design compares how students' creativity and comprehension scores change before and after the treatment, as well as between the two groups.

The comprehension tests and creativity questionnaires form two categories of research tools. A closed-ended questionnaire based on Guilford and Torrance indicators, covering fluency (idea production), flexibility (thinking flexibility), originality (idea uniqueness), and elaboration (concept development), was used to measure student creativity. This questionnaire consists of 20 statement items on a 1-5 Likert scale. The validation conducted by experts at the elementary school provided expert assessments to verify content validity, and Cronbach's Alpha test was used to check the reliability of the instrument. The results show a good level of reliability.

Meanwhile, a 25-item multiple-choice objective test based on Bloom's Taxonomy of Understanding indicators, namely, understanding concepts, interpreting data, and applying knowledge, was used to measure student understanding. When the Pearson correlation test was used to assess the validity of these questions, two items were eliminated because the estimated r value was higher than the table r value for 23 items.

The software named IBM SPSS v.21 for Windows was used to process the data. Normality and homogeneity tests are required for parametric tests in data analysis, and the independent samples t-test is used for hypothesis testing to compare scores between the experimental and control groups. Data intervals and ratios are used in this test to see if the use of audio-visual learning materials significantly affects students' creativity and understanding ([36]).

3. Results And Discussion

3.1 Results

To figure out how the use of audio-visual learning materials affects fifth-grade IPAS courses at SDN Mlajah 2 Bangkalan students' creativity and understanding, this research was tested using the IBM SPSS version 2.0.1 testing application. The results of the test on the effect of using audio-visual-based learning media on students' learning creativity in IPAS lessons in the fifth grade at SDN Mlajah 2 Bangkalan can be determined using an independent sample t-test as a hypothesis test. The results of the independent sample T-test on the variable of learning creativity can be seen in the following table:

Table 1. Statistical Description of the Average Scores Obtained by Students on Learning Creativity.

	Class	N	Mean	Std. De- viation	Std. Error Mean
Learning Creativity	Experiment's class	30	52.17	13.445	2.455
	Control's class	30	34.77	5.335	.974

According to the findings in Table 1, There is an 18-point disparity between the mean scores between the experimental group and the control group because the learning creativity variable in the experimental class has an average of 52.17 and the control class 34.17, with a total average of 86.34. The following graph displays the variation in average scores that students received for learning creativity:

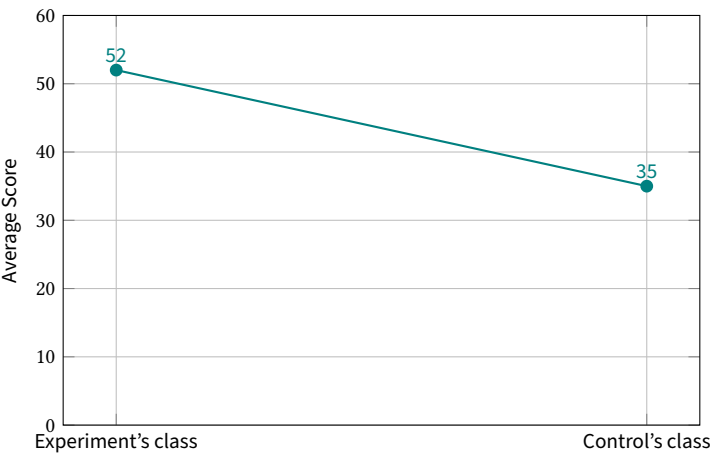


Figure 1. Average Student Scores in Relation to Learning Creativity Graph

Considering these results, the final hypothesis test to determine whether the use of audio-visual teaching materials has a significant impact on the learning creativity of fifth-grade students participating in the IPAS subject at SDN Mlajah 2 Bangkalan is the independent sample T-test. The table below shows the findings from the independent sample T-test:

There is a significant difference or impact from the application of audio-visual-based learning media on learning creativity in the IPAS subject in the 5th grade at SDN Mlajah 2 Bangkalan, as indicated by the t-test findings with a value of $0.000 < 0.05$ for independent samples on learning creativity, presented in Table 2. This is because H_0 is accepted, and H_a is rejected.

Table 2. The Outcome of the independent sample T-test on Learning Creativity

Levene's Criteria for Equality of Variances				T-test for Equality of average						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error	Difference 95% Confidence Interval of the Difference		
								Lower	Upper	
Learni Creativ- ity	Equal vari- ances as- sumer	43.04 ^a	.000	6.589	58	.000	17.400	2.641	12.114	22.686
	Equal vari- ances not as- sumer			6.589	37.911	.000	17.400	2.641	12.053	22.747

Sources: IBM SPSS v 2.0.1

The t-test for independent samples can be used as a hypothesis test to determine the test results on the effect of using audio-visual-based educational resources on learning comprehension in the IPAS topic in the fifth grade at SDN Mlajah 2 Bangkalan. The results of the independent sample T-test on the variable of learning creativity can be seen in the following table:

Table 3. Statistical Description of the Average Scores Obtained by Students on Understanding Learning

	Class	N	Mean	Std. Deviation	Std. Error Mean
Understanding Learning	Experimental class	30	73.00	23.216	4.239
	Control's class	30	43.20	14.981	2.735

According to the findings in Table 3, the understanding learning variable in the experimental class has an average of 73.00, while the control class has an average of 43.20 with resulting in a difference of 29.8 points in the average score between the experimental group and the control group. The following graph displays the variation in average scores that students received for understanding learning:

Figure 2. Average Student Scores in Relation to Understanding Learning Graph Considering these findings, an independent sample T-test was used as the final hypothesis test to determine whether the use of audio-visual learning media significantly affects the learning understanding of fifth-grade students in the IPAS subject at SDN Mlajah 2 Bangkalan. The outcome of the T-test can be seen in the table below:

It is apparent that there is a significant difference or affect from the utilization of audio-visual-based learning media on student understanding in the IPAS subject in the fifth grade at SDN Mlajah 2 Bangkalan, which is shown by the outcomes of the independent sample T-test on student understanding, which are explained in Table 4. Since H_0 is accepted and H_a is rejected, it can be determined that there is a significant difference or influence.

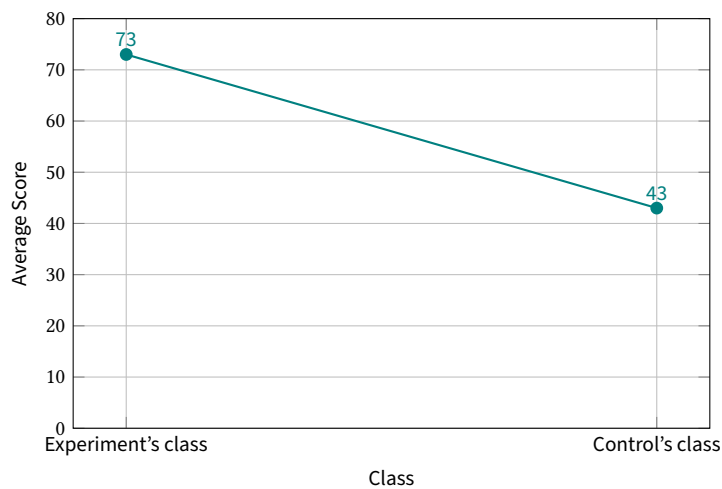


Figure 2. Average Student Scores in Relation to Understanding Learning Graph

Table 4. The Outcome of the independent sample T-test on Understanding Learning

Levene's Criteria for Equality of Variances						T-test for Equality of average				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Dif-fer-ence	Std. Er-ror	Difference 95% Confi-dence Interval of the Difference	
								Lower		Upper
Under Learn-ing	Equal vari-ances as-sumed	7.333	.009	5.907	58	.000	29.800	5.044	19.702	39.898
	Equal vari-ances not as-sumed			5.907	49.583	.000	29.800	5.044	19.666	39.934

Sources: IBM SPSS v 2.0.1

3.2 Discussion

Referring to the statistical data description results mentioned above, the experimental class’s learning creativity variable has an average of 52.17, while the control class has an average of 34.17, with a total average of 86.34. This indicates a difference or gap of 18 points in the average score between the experimental and control groups. The average value for the learning comprehension variable in the experimental class is 73.00, while the control class has an average of 43.20, with a total average of 116.2. This indicates a difference or gap of 29.8 points in the average score between the experimental and control groups. The hypothesis test conducted in this study using the independent samples T-Test showed a significance value of $0.000 < 0.05$, so it can be concluded that there is a significant difference or effect of using audio-visual-based learning media on learning creativity in IPAS lessons in class V SDN Mlajah 2 Bangkalan. The independent samples T-Test showed a significance value of $0.000 < 0.05$, so it can be concluded that there is a significant difference or effect of using

audio-visual-based learning media on student understanding in IPAS lessons in class V SDN Mlajah 2 Bangkalan.

This finding is consistent with the research findings conducted in 2021 by Wardiah and Kuswidyanarko, which showed that using audio-visual animation media in science classes can improve students' creative thinking capacity. Further evidence was provided by [37], who found that audiovisual materials derived from recycled sources can improve students' problem-solving capacity and conceptual understanding. According to student comments, [38] also found that video media in science education is quite beneficial. According to [39], audio-visual materials are very important for fostering students' conceptual knowledge and creativity throughout the learning process.

Constructivist theory, which emphasizes that learning occurs actively thru inquiry, experience, and engagement with the learning environment, can be used to explain the increase in students' creativity and understanding. Thru contextual imagery and storytelling, students can develop understanding thru audiovisual materials including documentaries, educational animations, and interactive simulations. In addition to strengthening their conceptual understanding thru meaningful learning experiences, students who participate in group projects, create posters, and give multimedia presentations also develop critical and creative thinking skills. Divergent thinking and problem-solving techniques, which are characteristic of creativity in learning, are reflected in this activity.

Primary school teaching methods are heavily influenced by the use of audio-visual materials. As a facilitator, the teacher selects and integrates media based on learning objectives and student characteristics. Teachers at SDN Mlajah 2 Bangkalan demonstrated their ability to handle media systematically, from the first impression to the final assessment. Beside being a tool, audiovisual materials are now an important component in student-centered learning strategies. With the help of this media, students can better understand abstract ideas such as human body functions, connect content to personal experiences, and adjust to their own learning preferences. This study suggests that other elementary schools consider implementing similar tactics while considering students' contextual needs, infrastructure availability, and teacher readiness.

4. Conclusions

The hypothesis test that was conducted in this study using the independent samples T-Test for learning creativity showed a significance value of $0.000 < 0.05$, and the independent samples T-Test for student understanding showed a significance value of $0.000 < 0.05$. Therefore, it can be concluded that there is a significant difference or effect from the use of audio-visual-based learning media on student creativity and understanding in IPAS lessons in class V at SDN Mlajah 2 Bangkalan.

Based on these findings, teachers are expected to methodically incorporate audio-visual materials into IPAS and other subjects. As part of group discussions, project-based learning techniques, or presentation assignments, instructional videos, interactive animations, and visual simulations can be used. To be able to select and modify media based on the quality of their students and the learning objectives they wish to achieve, educators must also receive training. To enhance the emphasis and sustainability of audiovisual material usage, schools can also consider creating digital learning resources based on the national curriculum and contextual information.

However, it is important to consider the limitations of this study. Further research is still needed to generalize the findings to higher education levels or other disciplines because this study only included elementary school students and focused on a single topic. Therefore, it is recommended to conduct more research to test the effectiveness of audiovisual learning materials in secondary and higher education settings, as well as on topics with different characteristics such as language, art, or mathematics. The potential of audio-visual media as a flexible and revolutionary teaching method

will be better understood thru cross-level and cross-disciplinary research.

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