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When Educational Videos Do Not Improve Learning: A Case Study on IPAS Achievement Among Fourth-Grade Students

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Abstract: This study aims to analyze the effect of educational video media on students' learning achievement in the IPAS subject at SDN 007 Balikpapan Barat. The research employed a quantitative pre-experimental design using a one-shot case study with 13 fourth-grade students as participants. Data were collected using a questionnaire consisting of 10 items and analyzed through validity testing, reliability testing, assumption testing, and hypothesis testing. The results of the t-test showed that the use of educational video media did not have a significant effect on students' learning achievement (t = 1.550 < ttable = 2.201, p = 0.149). The coefficient of determination (R^2 = 0.179) indicated that educational video media contributed only 17.9% to the variance in student achievement. These findings suggest that educational videos, when used independently, are not sufficient to improve learning outcomes in IPAS. Greater instructional support and more varied teaching strategies may be required to optimize their effectiveness.

Keywords: Educational Video Media; IPAS Learning; Student Learning Achievement; Elementary Education; Digital Learning Media.

Abstrak: *Penelitian ini bertujuan untuk menganalisis pengaruh media video edukatif terhadap prestasi belajar siswa pada mata pelajaran IPAS di SDN 007 Balikpapan Barat. Jenis penelitian yang digunakan adalah penelitian kuantitatif dengan desain pre-experimental tipe one-shot case study, melibatkan 13 siswa kelas IV sebagai subjek. Data dikumpulkan melalui angket berisi 10 butir pernyataan, kemudian dianalisis melalui uji validitas, reliabilitas, uji prasyarat, dan uji hipotesis. Hasil uji t menunjukkan bahwa penggunaan media video edukatif tidak berpengaruh signifikan terhadap prestasi belajar siswa (t = 1,550 < t_tabel = 2,201; p = 0,149). Nilai koefisien determinasi (R^2 = 0,179) menunjukkan bahwa media video edukatif hanya memberikan kontribusi sebesar 17,9% terhadap variasi prestasi belajar siswa. Temuan ini mengindikasikan bahwa penggunaan video edukatif secara tunggal belum mampu meningkatkan hasil belajar IPAS sehingga diperlukan strategi pembelajaran yang lebih komprehensif dan interaktif.*

Kata kunci: *Media Video Pendidikan; Pembelajaran IPAS; Prestasi Belajar Siswa; Pendidikan Dasar; Media Pembelajaran Digital.*

Introduction

The integration of digital media into elementary education has become an essential component of effective teaching practices in the twenty-first century. Rapid technological advancement has transformed how students process information, engage with learning materials, and develop foundational scientific and social competencies. In this context, educational video media has gained increasing attention as a powerful tool for presenting concepts in visual, concrete, and interactive formats that align with young learners' cognitive characteristics. Video-based instruction is believed to enhance conceptual clarity, stimulate curiosity, and help bridge the gap between abstract content and real-life applications, especially in integrated subjects such as Science and Social Studies (IPAS) at the primary school level.

The Multimedia Learning Theory proposed by Mayer, (2024) posits that students learn more effectively from a combination of words and pictures than from words alone. Visual–verbal integration enables deeper cognitive processing, reduces extraneous cognitive load, and supports retention and transfer of knowledge. Several empirical studies in recent years have supported this theoretical foundation. Arni et al., (2025); Saeed & Zaman, (2024),demonstrated that well-designed educational videos significantly enhance students' conceptual understanding in elementary science. Similarly, Kurniawan et al., (2025) found that video-based instruction increases motivation and engagement in social science learning environments. These findings suggest that educational videos have substantial potential to enrich the learning experience when developed and implemented properly.

Despite these advantages, the effectiveness of video media in improving academic achievement remains inconsistent across studies. Research by Tseng, (2021) and Ayres & Ackermans, (2025) highlighted that although videos can enhance engagement, they do not always lead to measurable improvements in learning outcomes. Other studies indicate that effectiveness depends heavily on instructional design, teacher facilitation, alignment with learning objectives, and the extent to which videos are integrated with follow-up activities that promote higher-order thinking (Brame, 2016). Furthermore, students' prior knowledge, attention span, and learning preferences significantly moderate the impact of video-based instruction on academic performance.

These mixed results illustrate a notable research gap: while educational videos are widely used in schools, their actual influence on academic achievement in specific contexts particularly in integrated elementary subjects such as IPAS remains unclear. Previous studies have predominantly been conducted in technologically developed regions, while research in developing contexts such as Indonesian public schools is still limited. Additionally, most international studies employ quasi-experimental or true experimental designs, whereas research using pre-experimental one-shot case study designs remains scarce. Although such designs are less rigorous, they offer valuable insights into authentic classroom practices where full experimental control is not feasible.

In Indonesia, the implementation of the Merdeka Curriculum emphasizes student-centered learning, contextual experiences, and the integration of digital media to promote conceptual understanding. Teachers are encouraged to use multimedia resources, including educational videos, to support interactive and differentiated learning. However, observational studies indicate that teachers often use videos merely as supplementary material without adequate instructional scaffolding,

integration with inquiry-based activities, or alignment with assessment goals (Ibrahim et al., 2023).

Within the context of SDN 007 Balikpapan Barat, teachers regularly employ educational videos in IPAS lessons. Nevertheless, based on preliminary interviews, teachers reported that students' learning outcomes remain varied, and improvements in academic achievement are not consistently observed. This situation points to a potential mismatch between the use of video media and the instructional strategies applied in the classroom. Moreover, the unique characteristics of IPAS as an integrative subject requiring logical reasoning, environmental awareness, and scientific thinking, necessitate more than just exposure to visual media. Effective learning demands guided exploration, discussion, reflection, and reinforcement activities that ensure deep comprehension.

Given the pedagogical trends, theoretical expectations, and practical challenges identified above, it becomes necessary to conduct an empirical study that evaluates the influence of educational video media on student learning outcomes within a real classroom setting. This study therefore aims to analyze the effect of using educational video media on the IPAS learning achievement of fourth-grade students at SDN 007 Balikpapan Barat. By employing a pre-experimental one-shot case study design, this research provides context-specific evidence that complements the broader international discourse and offers insight into how video-based instruction functions in everyday school environments.

The findings of this study are expected to contribute to the literature in several ways. Theoretically, the study adds to the growing body of research examining how multimedia learning principles operate in elementary-level integrated subjects. Practically, the results offer guidance for teachers and curriculum designers seeking to use educational videos effectively in the classroom. Understanding the conditions under which video media does or does not enhance academic achievement can help schools design improved instructional strategies that align with students' learning needs. At the policy level, the study can inform efforts to strengthen digital literacy and media integration within the Merdeka Curriculum, ensuring that technological adoption translates into tangible learning benefits rather than mere procedural compliance.

Method

The present study employed a quantitative approach using a pre-experimental design, specifically the one-shot case study model. This design was selected because it allows researchers to examine the effect of an instructional intervention in a natural classroom environment where random assignment is not feasible. In this approach, a single group is exposed to the treatment, and the learning outcome is then measured. Although pre-experimental designs have limited internal validity compared to authentic experimental designs, they are widely used in school-based research to obtain preliminary evidence of instructional effects under authentic teaching conditions.

The study was conducted at SDN 007 Balikpapan Barat during the even semester of the 2024/2025 academic year. The participants consisted of 13 fourth-grade students from Class 4A, all of whom were selected using a saturated sampling technique. Saturated sampling was used because the total number of students in the target class was relatively small, and including the entire population ensured comprehensive data representation. The instructional intervention utilized

educational video media aligned with IPAS learning objectives. These videos contained visual explanations, narration, and animated sequences designed to facilitate students' understanding of scientific and social concepts.

Data collection was conducted using a structured questionnaire consisting of 10 items designed to measure students' responses and learning outcomes after the intervention. The instrument was developed based on established indicators of instructional media effectiveness and student learning performance. Prior to its use in the field, the questionnaire underwent preliminary testing to evaluate its construct validity and internal consistency. Validity assessment employed Pearson's product–moment correlation to determine whether each item represented the intended construct. Reliability assessment applied the Cronbach's Alpha procedure to measure the instrument's internal consistency.

The procedure of data collection consisted of four stages: (1) conducting preliminary interviews and observations to understand students' and teachers' prior experiences with educational video media; (2) delivering the IPAS learning session using the selected educational video; (3) administering the questionnaire immediately after the intervention; and (4) coding and analyzing the responses using SPSS version 26. Data analysis procedures included validity and reliability tests, assumption tests (normality and linearity), and hypothesis testing using simple linear regression. The Kolmogorov–Smirnov normality test indicated that the data were normally distributed. In contrast, the linearity test confirmed that the relationship between the independent variable (educational video media) and the dependent variable (student achievement) was linear. Hypothesis testing was conducted using a t-test with a significance threshold of 0.05 to determine whether the intervention had a statistically significant effect on learning outcomes.

Result and Discussion

Result

1. Descriptive Statistics

This study involved 13 fourth-grade students. Two variables were measured: educational video media (X) and IPAS learning achievement (Y), both assessed using a 10-item Likert-type questionnaire. Overall, the descriptive tendency of the data indicates that students responded positively to the use of video media, although their learning achievement showed noticeable variation. Most students fell within the medium category of achievement.

2. Instrument Validity Test

The validity test was conducted using Pearson's Product–Moment correlation. With N = 13, the critical r-table value is 0.553 at a 5% significance level. All items demonstrated r-calculated > r-table with $p < 0.05$, indicating that every item in the instrument is valid and appropriately measures the intended constructs.

Table 1. Instrument Validity Test Results

Item	r-calculated	r-table	Sig.	Interpretation
1–10	> 0.553	0.553	< 0.0	Valid

3. Reliability Test

Reliability was examined using Cronbach's Alpha. The coefficient obtained was: Cronbach's Alpha = 0.706. Since this exceeds the acceptable minimum threshold of 0.60, the questionnaire is considered reliable and internally consistent.

Table 2. Reliability Test

Variable	Number of Items	Cronbach's Alpha	Criterion	Interpretation
Educational Video Media & Learning Achievement	10	0.706	≥ 0.60	Reliable

4. Normality Test

Kolmogorov–Smirnov analysis was performed to test data normality. Sig. = 0.200 > 0.05. This indicates that the data are normally distributed, fulfilling a key assumption for parametric analysis.

Table 3. Normality Test (Kolmogorov–Smirnov)

Test	Statistic	df	Sig.	Interpretation
Kolmogorov–Smirnov	0.166	13	0.200	Normal

5. Linearity Test

The ANOVA linearity test yielded the following results: F = 2.404, Sig. = 0.149 (> 0.05). Thus, there is no statistically significant linear relationship between educational video media (X) and students' learning achievement (Y).

Table 4. Linearity Test Results

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	46.212	1	46.212	2.404	0.149
Residual	211.480	11	19.225		
Total	257.692	12			

6. Simple Regression Analysis

The regression output shows: R = 0.423, R^2 = 0.179. This means that educational video media explains only 17.9% of the variance in students' learning achievement. The remaining 82.1% is influenced by other factors not included in the model.

Table 5. Model Summary

Model	R	R^2	Adjusted R^2	Std. Error
1	0.423	0.179	0.105	4.385

Based on these results, H_0 is accepted, indicating that educational video media does not have a statistically significant effect on students' IPAS learning achievement.

Table 6. Regression Coefficient Test

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	5.149	17.690	—	0.291	0.776
Educational Video Media (X)	0.318	0.205	0.423	1.550	0.149

7. Overall Interpretation

1. The measurement instruments are both valid and reliable.
2. The dataset meets the normality assumption.
3. There is no significant linear relationship between educational video use and student achievement.
4. The model explains only 17.9% of the variance in achievement, suggesting that:
   a. video media alone is not sufficient to improve learning outcomes,
   b. additional instructional strategies are required to enhance effectiveness.

Discussion

The findings of this study indicate that the use of educational video media did not lead to a significant improvement in students' IPAS learning achievement. Although students appeared engaged during the instructional session, the statistical results demonstrate that the intervention did not produce measurable academic gains. This outcome highlights the distinction between *engagement* and *achievement*, a distinction emphasized in prior research, which shows that students may enjoy multimedia-based learning without demonstrating corresponding improvements in test performance (Davis & Frederick, 2020; Lindner et al., 2021; Yonanda et al., 2024).

From a theoretical standpoint, the findings resonate with Mayer's Multimedia Learning Theory, which argues that meaningful learning occurs when multimedia materials are accompanied by appropriate cognitive guidance (Mayer, 2024). Educational videos can support learning by combining narration, animation, and visual cues; however, their effectiveness depends heavily on how teachers structure the learning process. Several studies have confirmed that videos alone do not guarantee improved outcomes unless integrated with learner-centered activities, scaffolding, and instructional dialogue (Deng et al., 2024; Ibrahim et al., 2023). In this study, the one-shot instructional model may not have provided sufficient depth or reinforcement for students to internalize the content presented in the video.

The limited duration and single exposure to the video may have further restricted its impact on learning. Research consistently shows that video-based instruction is most effective when used repeatedly across multiple sessions and paired with follow-up tasks that prompt reflection, discussion, and application (Nagro et al., 2017; Najib et al., 2023; Ningsih et al., 2024). With only one instructional exposure, students likely lacked adequate time to process and consolidate the concepts presented, resulting in minimal observable gains in achievement.

Learner characteristics may also help explain the findings. Elementary students vary considerably in prior knowledge, attention span, and cognitive readiness, all of which influence how effectively they learn from video content. Studies have demonstrated that younger learners require structured teacher mediation to help them connect video-based information with existing knowledge frameworks (Najib et al., 2023; Ningsih et al., 2024). Without guided interaction, students may focus more on the entertaining aspects of the video rather than its conceptual message, thereby limiting deep learning.

Contextual factors within the school environment may have also contributed to the nonsignificant results. Interviews with teachers indicated that educational videos were often used as supplementary materials rather than as part of an intentionally designed pedagogical sequence. This pattern is consistent with findings that technology integration in low-resource or developing educational contexts tends to emphasize exposure rather than structured pedagogical alignment (Abedi, 2024). As a result, media such as videos may fail to produce measurable learning improvements unless accompanied by clear instructional objectives, guided practice, and assessment-linked activities.

Importantly, the lack of a significant effect does not imply that educational videos are inherently ineffective. Instead, the findings suggest that videos must be embedded within a broader instructional framework to yield meaningful cognitive benefits. Scholars emphasize that successful multimedia learning involves active processing, teacher facilitation, and opportunities for students to engage with the material in interactive and collaborative ways (Karna et al., 2025; La Torre & Désiron, 2024). Without these components, videos may enhance interest but not necessarily achievement, as reflected in the current study.

Overall, this study contributes to existing literature by reinforcing the idea that multimedia tools, including educational videos, are only as effective as the pedagogical strategies that accompany them. The results underscore the need for teachers to integrate video media with structured activities such as inquiry tasks, guided questioning, hands-on practice, and reflective discussion to optimize their impact on student learning outcomes.

Conclusion

The present study examined the influence of educational video media on the IPAS learning achievement of fourth-grade students and found that the intervention did not result in a statistically significant improvement in academic performance. Although students exhibited enthusiasm and engagement toward the use of multimedia, the instructional video alone was insufficient to produce measurable cognitive gains within the one-shot case study design. These findings reinforce existing evidence that multimedia tools must be accompanied by deliberate pedagogical scaffolding, repeated exposure, and meaningful opportunities for active learning to support adequate conceptual understanding. The study contributes to the growing body of literature indicating that technology integration, when implemented in isolation, does not guarantee enhanced learning outcomes and must be strategically aligned with instructional goals and classroom practices.

The implications of this research underscore the importance of adopting a more comprehensive instructional framework when integrating educational video media into primary education. Teachers are encouraged to integrate videos as part of a broader learning sequence that includes guided discussions, inquiry-based activities, hands-on tasks, and formative assessment to reinforce students' understanding. At the institutional level, schools should provide professional development that equips educators with skills to design and facilitate multimedia-enriched lessons that promote deep learning rather than passive consumption. Future research may explore longitudinal designs, cross-school comparisons, or mixed-method approaches to gain a more nuanced understanding of how video media can be optimized to improve learning outcomes across diverse educational settings.

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