JSEP (Journal of Sciences Education and Practice)
Published by Universitas Pakuan
https://jsep-pasca.unpak.ac.id/index.php/jsep
Vol. 10, No. 2, 2026 | Pages 461-473
ISSN: E 2549-7170 / P 2548-950X | https://doi.org/10.33751/jsep.v10i2.40
This article licensed under Creative Common Attribution 4.0 International

TikTok and YouTube as Supplementary Media for Elementary School Students' Interest in Science Learning

Marleny Leasa*, Vera Mercy Sopacua, Ali Awan

Universitas Pattimura, Ambon, Indonesia

✉* marleny.leasa@lecturer.unpatti.ac.id

Article Info

Keywords:
Social Media; Learning Interest; Science Learning; Tiktok; Youtube

Received:
10/08/2026
Revised:
11/10/2026
Accepted:
08/11/2026

Abstract

Background: TikTok and YouTube are increasingly used to present audiovisual learning materials. This study examined changes in fourth-grade students' interest in science learning following instruction supported by TikTok or YouTube and explored differences between the two groups. **Methods:** A quantitative quasi-experimental study was conducted with 41 fourth-grade students at SD Inpres 21 Ambon: 21 students learned with TikTok-supported materials and 20 with YouTube-supported materials. Data were collected using a learning-interest questionnaire and pretest–posttest measures. **Results:** Learning-interest scores were higher at posttest than at pretest in both groups. Questionnaire responses were generally positive across the reported indicators. The manuscript reports a statistically significant test ($p < .001$); however, the comparison underlying this result and an effect-size estimate must be specified from the reanalysed data before a definitive between-platform conclusion can be drawn. **Conclusion:** The findings descriptively suggest that TikTok- and YouTube-supported science instruction may be associated with higher student interest. Because both groups received an intervention and the reported analysis does not clearly establish whether the test assessed within-group change or between-group differences, the relative effectiveness of the two platforms cannot be determined from the current report.

INTRODUCTION

In today's digital era, the learning process is no longer limited to classrooms and blackboards but has evolved along with the advancement of information and communication technology. These technological developments have encouraged the emergence of various new learning media that are more varied, flexible, and aligned with students' characteristics. One form of technology that is closely integrated into people's daily lives, including students, is social media (Al-Rahmi et al., 2014). In the field of education, social media platforms have become an important element in educational development because they are capable of transforming learning methods by overcoming

the limitations of traditional classrooms and providing learning resources that are easily accessible to everyone (Siska & Dewi, 2021). Unlike conventional educational systems, social media offers a learning process that is more flexible, natural, and communicative, thereby supporting informal, spontaneous, and open interactions that are increasingly implemented in modern education (Dai et al., 2025). A study conducted by Sobaih et al. (2020) found that Facebook and WhatsApp played important roles in maintaining formal academic communication during the COVID-19 pandemic, particularly in higher education institutions in developing countries. Their findings demonstrated that these platforms facilitated communication between lecturers and students, supported the distribution of instructional materials, and enabled academic discussions and collaborative learning activities despite restrictions on face-to-face interaction. These findings suggest that the educational value of social media extends beyond information sharing, as its accessibility and interactive features can support learning continuity and student engagement. However, the effectiveness of these platforms depends on how their communication and collaborative functions are integrated into instructional practices. With the emergence of social media platforms, individuals now have access to a wide range of online resources that can enhance their learning abilities (Hu et al., 2024).

Previous studies suggest that social media platforms, including Facebook, WhatsApp, blogs, wikis, and online discussion forums, can facilitate a shift in students' roles from passive recipients of information to active participants in learning. These platforms provide opportunities for students to exchange educational resources, discuss academic topics, and collaborate in learning activities (Giannetto et al., 2013; Putnik et al., 2015; Neier & Zayer, 2016; Zachos & Anagnostopoulos, 2018). The rapid development of digital technology, particularly social media, has significantly changed the way people, especially young individuals, consume and access content. One type of content that has become highly popular is short-form videos, commonly known as "reels," on platforms such as TikTok and YouTube. The popularity of this short-video format has sparked discussions regarding its influence on concentration abilities and individuals' engagement in mental activities that require long-term focus, including academic activities. Reels generally last only a few seconds to about one minute and are designed to deliver entertainment or information quickly and concisely (Duffy & Hund, 2019). Although they effectively capture users' attention, the increasing consumption of reels among students has raised concerns about their impact on attention span and academic performance (Carrier et al., 2015). The high intensity of short-video consumption, particularly among young adults, has also encouraged researchers to examine its effects on cognitive functions, including the ability to sustain attention and learning outcomes (Haliti-sylaj & Sadiku, 2024). In educational practice, TikTok and YouTube can be utilized by teachers to present instructional videos relevant to the subject matter, such as experiment demonstrations, concept explanations, simulations, and practice exercises packaged in visually engaging ways. Teachers can guide students to watch specific videos, discuss their content, and complete assignments or exercises related to the material presented (Yang et al., 2025).

The use of TikTok and YouTube as learning media differs from conventional instructional media such as textbooks or printed materials. Traditional learning media tend to be one-way in nature and require students to read and comprehend the material independently, whereas TikTok and YouTube present learning content in a more dynamic audiovisual format (Mlambo, 2026). Learning videos allow students to directly observe

illustrations, processes, and real-life examples, thereby facilitating the understanding of concepts, particularly abstract concepts in science education (Shao et al., 2024). The structure and presentation of video content can guide students' attention while supporting the knowledge-construction process by directing their focus to relevant aspects at the appropriate time (Berney & Bétrancourt, 2016; Rosenthal, 2020). Instructional videos can support higher-order cognitive engagement in science learning by helping students understand scientific principles, apply mathematical concepts, interpret evidence, and develop experimental designs, rather than focusing exclusively on following procedural instructions (Ketsman et al., 2018; Saavedra & Schwartz, 2026). Furthermore, active cognitive engagement with instructional videos, including reviewing and interacting with specific content, has been associated with students' STEM learning processes (Kuhlmann et al., 2024). Students become more encouraged to ask questions and seek solutions to problems instead of simply following technical instructions, enabling them to develop an understanding of scientific evidence and gain opportunities for group discussions (Bennett et al., 2009; Croker et al., 2010). In addition, videos dynamically deliver information through audio and visual elements, clearly illustrating processes and situations, thus helping students build structured and high-quality mental models related to changes or complex processes. This approach has proven effective in supporting learning (Berney & Bétrancourt, 2016; Merkt et al., 2018). Furthermore, this difference may occur because TikTok's short-form video format encourages content creators to prioritize essential information and present learning materials in concise, visually engaging segments, making key concepts easier to grasp within a limited time. In contrast, YouTube accommodates longer video formats, allowing teachers to provide more comprehensive explanations, demonstrate scientific processes step by step, and connect different concepts through structured presentations. These differences in video duration and content organization may influence how students engage with and process scientific information. This was demonstrated in a study conducted at Tecnologico de Monterrey Mexico City, which found that students achieved positive learning outcomes and that 98% of students enjoyed learning through TikTok and YouTube videos because these platforms motivated them to learn (Jiménez & Ponce, 2022). Moreover, a study in Poland revealed that the most preferred platforms among Generation Z were Facebook, Messenger, YouTube, and Instagram. Most respondents used social media primarily to view other people's content rather than actively creating or sharing their own content (Krol & Zdonek, 2020).

Science subjects require students to understand abstract concepts and scientific processes that are sometimes difficult to explain solely through lectures or printed media. Therefore, learning approaches and media that can present materials visually, interactively, and contextually are needed to enhance students' interest in learning. Video-based media uploaded through TikTok and YouTube can serve as strategic alternatives for delivering science learning materials because they are easily accessible, engaging, and aligned with the characteristics of today's digital generation (Breslyn & Green, 2022). The integration of social media platforms such as TikTok and YouTube into the learning process contributes positively to increasing students' interest in learning (Kohler & Dietrich, 2021; Conde-Caballero et al., 2023). Increased learning interest can positively affect students' academic achievement and lead to more optimal learning outcomes. Furthermore, this evidence-based approach can also be effectively applied to help students understand other complex or difficult scientific concepts (Toli & Kallery, 2021). This is supported by a

study conducted among elementary school students in Kupang, East Nusa Tenggara, which revealed that the introduction of TikTok encouraged students to become more actively engaged in content and collective discussions, while also improving their motivation and science learning outcomes (Kopa et al., 2024). In addition, a study by Mohammed & Ogar (2023) found that students performed better on post-learning tests after being exposed to YouTube videos. These findings are further reinforced by a study conducted in China by Zhang (2026), which showed that the use of social media in science education had several positive impacts, including: (1) increased classroom participation, (2) improved representation of scientific phenomena through 3D models, and (3) enhanced student–teacher interaction through digital platforms. Digital media in early childhood education can also create greater opportunities for children from low-income families to improve their science learning experiences and achieve their educational goals (Lee & Tu, 2017).

Learning interest is one of the important indicators of success in the science education process (Pan et al., 2018). In addition, the continuous development of learning interest is regarded as one of the primary goals of formal education in schools. Studies on learning interest generally focus on identifying its relationship with various characteristics of the learning environment, such as the types of instructional methods used, as well as its association with other motivational aspects, including self-efficacy (Kehle & Urhahne, 2026). At SD Inpres 21 Ambon, the initial assessment revealed that students' performance in science learning was relatively low, with 90.5% of students in Class IVA and 100% of students in Class IVB obtaining scores below 70. This initial condition highlighted the need to explore instructional approaches that could stimulate students' interest in science learning. In particular, the use of audiovisual learning media such as TikTok and YouTube was considered relevant because these platforms offer alternative ways of presenting scientific concepts through engaging video content. Accordingly, this study examined the use of TikTok and YouTube as supplementary learning media to investigate changes in elementary school students' interest in science learning. Learning interest and discipline both have a positive influence on learning motivation (Herpratiwi & Tohir, 2022). Social media has a close relationship with students' learning interest because it is capable of providing enjoyable, non-monotonous learning experiences that align with students' digital habits. When learning is connected to media that are already familiar in students' daily lives, students' attention and engagement in the learning process tend to increase. Furthermore, studies indicate that most students are already familiar with and actively use social media outside school activities, such as watching YouTube videos and accessing short-form video content. However, the use of social media has not yet been systematically integrated into classroom learning activities (Li et al., 2014). This condition indicates a gap between students' digital habits and the instructional approaches implemented in schools, resulting in the underutilization of social media's potential as a supporting learning medium. Therefore, social media can function as a complementary instructional medium that supports, rather than replaces, conventional teaching methods. Based on this background, this study aims to examine the influence of using social media as a supporting medium in science learning on elementary school students' learning interest.

METHODS

This study employed a quantitative approach using a quasi-experimental two-group pretest–posttest comparison design. Both groups received an instructional intervention: one group learned with TikTok-supported materials and the other with YouTube-supported materials. Because neither group received no treatment, neither should be described as a conventional control group. The design was used to examine changes in students' science-learning interest and, where measured separately, learning outcomes, as shown in Table 1.

Table 1. Quasi-Experimental Two-Group Pretest–Posttest Comparison Design

Class	Pretest	Treatment	Postest
IV.1	O_1	X (TikTok)	O_2
IV.2	O_3	X (Youtube)	O_4

Adapted from: (Mohr, 1982)

Description:

O_1 and O_3 : Pretests conducted to assess students' initial learning interest.

O_2 and O_4 : Posttests conducted to measure changes in students' learning interest following the treatment.

X : Treatment involving the use of TikTok and YouTube in science instruction.

The population of this study comprised all fourth-grade students at SD Inpres 21 Ambon, Indonesia. The sample consisted of 41 students, comprising 21 students from Class IVA who participated in science learning using TikTok-based instructional media and 20 students from Class IVB who used YouTube-based instructional media. The sampling technique was reported as random sampling, with the selected participants serving as the basis for comparing students' learning experiences using the two social media platforms. Appropriate sampling procedures are essential in educational research because they can influence sample representativeness, research validity, and the extent to which findings can be generalized to a broader population (Ahmed, 2024). Furthermore, selecting a sampling technique that aligns with the research objectives and population characteristics strengthens the methodological rigor of empirical investigations.

The research instruments consisted of pretests and posttests used to measure students' learning outcomes after participating in science learning on the topic of photosynthesis using TikTok- and YouTube-based learning media. These tests were designed to assess students' understanding of photosynthesis concepts before and after the instructional interventions. In addition, a questionnaire was administered to measure students' interest in science learning after receiving instruction through these two social media platforms. The questionnaire focused on five dimensions of learning interest: attention, enjoyment, participation, persistence, and learning intention. Before being used in the main study, the research instruments underwent a validation process involving three experts with different areas of specialization, namely a plant science expert, a science education expert, and an educational technology expert. This expert validation was conducted to ensure the scientific accuracy of the content, the appropriateness of the learning indicators, and the suitability of the instruments for the characteristics of elementary school students. Furthermore, the questionnaire was pilot-tested with 250

fifth- and sixth-grade students from several elementary schools in Ambon City. This preliminary testing was intended to evaluate the validity and reliability of the questionnaire before its implementation in the main research sample. The results showed a validity coefficient of 0.87 and a reliability coefficient of 0.86, indicating that the questionnaire demonstrated satisfactory psychometric properties and was sufficiently reliable for assessing students' interest in science learning.

Data collection in this study was conducted using several techniques. The questionnaire was distributed to fourth-grade students of SD Inpres 21 Ambon who served as the research sample. It was used to obtain data regarding students' interest in science learning after participating in lessons using TikTok- and YouTube-based learning media. Interest has been widely recognized as a factor that encourages engagement, efficiency, effort, and persistence in learning (Mitchell, 1993; Trautwein et al., 2015). The questionnaire framework used in this study is presented in Table 2.

Table 2. Questionnaire Blueprint

Learning Interest Indicator	Measured Aspect	Positive Item Number	Negative Item Number
Attention	Students' interest when the teacher explains material through social media	1	2
	Students' focus during social media–based learning	3	4
Enjoyment	Students' enjoyment while learning through social media	5	6
	Students' enthusiasm in receiving assignments through social media	7	8
Participation	Students' involvement in discussions/learning through social media	9	10
	Students' initiative in asking or answering questions during learning	11	12
Persistence	Students' seriousness in completing assignments from the teacher	13	14
Learning Intention	Students' readiness to study independently at home with the assistance of social media	15	16
Total Items		16 Items	

The questionnaire in this study employed a Likert scale to measure respondents' opinions, attitudes, and perceptions regarding the given statements. Scoring was based on the respondents' selected answers. "Strongly Agree" was scored 5, "Agree" was scored 4, "Less Agree" was scored 3, "Disagree" was scored 2, and "Strongly Disagree" was scored 1. The higher the score obtained, the more positive the respondent's level of agreement toward the statements presented in the questionnaire (Likert, 1979). The researchers administered pretests and posttests to the students. The pretest was conducted before students participated in learning activities using TikTok- and YouTube-based learning media. It aimed to determine students' initial abilities and prior understanding of the material to be studied. Meanwhile, the posttest was conducted after

the learning process had been completed to identify students' level of understanding after receiving instruction through TikTok and YouTube media. By comparing the pretest and posttest results, the researchers were able to identify changes or improvements in students' understanding and evaluate the use of social media–based learning media as a supporting medium for science learning. The obtained data were analyzed using descriptive analysis, assumption or prerequisite tests, and hypothesis testing. After conducting normality and homogeneity tests, mean difference analysis was performed to compare the achievement of both classes. The analysis used was the Independent Sample t-Test with a significance level of 0.05 using SPSS 23 software.

RESULT AND DISCUSSION

The condition of the landfill in Tread Jedah is not suitable for disposal. The location right on the side of the road is very unpleasant to see. The community has unknowingly damaged the surrounding natural ecosystem. The distribution of pre-test and post-test scores for both classes is presented in Table 3.

Table 3. Test Results of Learning Media Utilization

Tiktok (4-A)						**Youtube (4-B)**					
Pretest			**Posttest**			**Pretest**			**Posttest**		
Interval	**F**	**%**	**Interval**	**F**	**%**	**Interval**	**F**	**%**	**Interval**	**F**	**%**
91-100	0	0	91-100	0	0	91-100	0	0	91-100	1	5
81-90	0	0	81-90	8	38.1	81-90	0	0	81-90	10	50
71–80	2	9.5	71–80	7	33.3	71–80	0	0	71–80	7	35
<70	19	90.5	<70	6	28.6	<70	20	100	<70	2	10
Total	21	100%	Total	21	100%	Total	20	100%	Total	20	100%

Based on the data presented in Table 3, it can be seen that in the class using TikTok as a learning medium, the pretest results showed that most students were in the score category below 70, accounting for 90.5%, indicating that students' initial learning interest was relatively low. However, after the implementation of TikTok-based learning, the posttest results demonstrated a considerable improvement, with most students achieving scores within the 81–90 and 71–80 intervals. A similar pattern was observed in the class that used YouTube as a learning medium. In the pretest, all students (100%) were in the score category below 70, indicating a low level of learning interest prior to the treatment. Following the implementation of YouTube-based learning, the posttest results showed a significant improvement, with the majority of students achieving scores within the 81–90 and 71–80 intervals. A similar pattern was also observed in the class using YouTube as a learning medium. In the pretest results, all students (100%) were categorized within the score interval below 70, indicating low learning interest before the treatment was administered. After participating in learning activities using YouTube-based media, the posttest results improved, with the majority of students achieving scores within the 81–90 and 71–80 intervals. Students' learning interest in this study was measured using a questionnaire consisting of 16 statement items covering five indicators: attention, enjoyment, participation, persistence, and learning intention. The questionnaire was designed using a Likert scale with five response options: Strongly Agree (SA), Agree (A), Less Agree (LA), Disagree (D), and Strongly Disagree (SD). The percentage distribution results of the students' learning interest questionnaire are presented in Table 4.

Table 4. Percentage Distribution of Students' Learning Interest Questionnaire

No	Statement	SA	A	LA	D	SD	Mean
A. Attention							
1	I am interested in participating in learning when the teacher explains the material through social media.	21 (51.2%)	20 (48.8%)	0	0	0	4.51
2	I feel uninterested when the teacher explains the material using social media.	0	0	6 (14.6%)	28 (68.3%)	7 (17.1%)	4.46
3	I can stay focused during social media–based learning from beginning to end.	21 (51.2%)	20 (48.8%)	0	0	0	4.51
4	I often lose focus when participating in learning through social media.	0	0	13 (31.7%)	28 (68.3%)	0	1.63
Average Attention Indicator							3.53 (High)
B. Enjoyment							
5	I enjoy learning through social media.	21 (51.2%)	20 (48.8%)	0	0	0	4.51
6	I feel bored when learning is conducted through social media.	0	0	6 (14.6%)	28 (68.3%)	7 (17.1%)	1.46
7	I am enthusiastic about receiving and completing assignments given through social media.	21 (51.2%)	20 (48.8%)	0	0	0	4.51
8	I am less enthusiastic about receiving assignments through social media.	0	0	20 (48.8%)	21 (51.2%)	0	1.88
Average Enjoyment Indicator							3.59 (High)
C. Participation							
9	I actively participate in learning discussions through social media.	21 (51.2%)	20 (48.8%)	0	0	0	4.51
10	I rarely participate in learning discussions through social media.	0	0	6 (14.6%)	28 (68.3%)	7 (17.1%)	1,46
11	I take the initiative to ask or answer questions during learning through social media.	21 (51.2%)	20 (48.8%)	0	0	0	4.51
12	I am reluctant to ask or answer questions during learning through social media.	0	0	13 (31.7%)	28 (68.3%)	0	1.63

Average Participation Indicator							3.53 (High)
D. Persistence							
13	I seriously complete assignments given by the teacher through social media.	21 (51.2%)	20 (48.8%)	0	0	0	4.51
14	I often postpone or do not complete assignments given through social media.	0	0	6 (14.6%)	28 (68.3%)	7 (17.1%)	1,46
Average Persistence Indicator							2.98 (Moderate)
E. Learning Intention							
15	I am prepared to study independently at home with the assistance of social media.	21 (51.2%)	20 (48.8%)	0	0	0	4.51
16	I do not have the intention to study independently even though social media is available.	0	0	6 (14.6%)	28 (68.3%)	7 (17.1%)	1.45
Average Learning Intention Indicator							2.99 (Moderate)

Overall, the results indicate that the use of social media as a supporting medium for science learning is capable of increasing students' interest in learning. This is evidenced by the high level of positive responses shown by students across all measured indicators, suggesting that social media has a positive influence on students' learning interest. The results of the normality test using SPSS on the learning interest variable in the YouTube-based learning class showed a significance value greater than 0.05, indicating that the data were normally distributed. Meanwhile, the homogeneity test for the classes using TikTok-based and YouTube-based learning media also produced a significance value greater than 0.05, which indicates that the data were homogeneous. The hypothesis testing was conducted using the Independent Sample t-Test with a significance level of 5% (0.05). In this study, the researchers utilized SPSS 23.0 software to analyze the hypothesis testing results.

Table 5. Independent Sample t-Test Results

Variable	Class	Sig	Criteria	Description
Learning Interest	TikTok Media	0.000	0.05	Significant Effect

Based The findings of this study highlight the use of TikTok and YouTube as supplementary media in science learning, particularly in teaching photosynthesis to elementary school students. Both platforms were used to deliver science instruction on the topic of photosynthesis. Therefore, this study focused not only on the advantages of TikTok and YouTube as social media platforms but also on their use as supporting media in science learning. Photosynthesis is a scientific concept that may be difficult for elementary school students to understand because the process cannot be directly observed. Previous research has shown that elementary school students may experience difficulties in understanding the processes and concepts involved in photosynthesis (Kamarudin & Noor, 2026). The use of learning videos can help students understand this process through visual explanations of the roles of sunlight, water, and carbon dioxide in plant food production. The questionnaire results also provide information about students' responses

to science learning through five indicators of learning interest: attention, enjoyment, participation, persistence, and learning intention. The positive responses in the attention, enjoyment, and participation indicators indicate that students showed interest in following the lessons and participating in learning activities. This is consistent with research indicating that the use of TikTok can support students' interest in science concepts through engaging content and visual presentation (Ling & Nasri, 2024). However, the moderate average scores for persistence and learning intention suggest that students' positive responses during classroom learning did not necessarily reflect their consistency in completing assignments or their intention to study independently.

These findings are consistent with recent studies highlighting the role of audiovisual media in supporting science learning. Learning videos provide visual and contextual explanations that can make abstract scientific concepts easier for elementary school students to understand. When integrated with appropriate instructional approaches, these videos can also create more engaging learning experiences and support students' understanding of science concepts (Wibawa et al., 2024). Similarly, YouTube videos have been identified as an effective supplementary medium for supporting science learning and improving learning outcomes among elementary school students (Musfiza et al., 2025). In the present study, TikTok and YouTube were used to present the same science topic, namely photosynthesis, to two groups of fourth-grade students. Through video-based presentations, students were introduced to the process of photosynthesis in a more visual and accessible way, which may have helped them follow the learning activities and develop an interest in the topic. The results showed positive changes in students' learning interest in both groups, suggesting that both platforms have the potential to support students' engagement in science learning. However, the available statistical results do not clearly establish whether one platform was more effective than the other. Therefore, TikTok and YouTube can be considered supplementary learning media that may help teachers present science concepts, particularly photosynthesis, in an engaging manner and encourage students' interest in learning science.

CONCLUSION

Based on the results of the research and discussion that have been conducted, it can be concluded that the use of social media as a supporting medium for science learning is able to enhance elementary school students' interest in learning. The utilization of TikTok and YouTube provides a more engaging, interactive, and relevant learning experience that aligns with the characteristics of students in the digital era. The presentation of learning materials through audiovisual videos helps students understand abstract science concepts more easily while making the learning process more enjoyable and less monotonous. The use of social media in learning also encourages students to participate more actively in learning activities, including paying attention to teachers' explanations, engaging in discussions, and completing learning tasks. In addition, social media can create a more flexible and contextual learning environment because students are already familiar with these platforms in their daily lives. This condition increases students' motivation and interest in science learning. Therefore, social media can serve as an innovative alternative learning medium that supports the effectiveness of science education in elementary schools. However, its implementation still requires guidance and

supervision from teachers to ensure that social media is used appropriately, purposefully, and in accordance with the intended learning objectives. The findings of this study imply that social media can become an effective alternative instructional medium for increasing elementary school students' interest in learning, particularly in science education. The use of TikTok and YouTube enables teachers to present learning materials in a more engaging, interactive, and digitally relevant manner. Therefore, teachers need to develop creativity in designing social media–based learning content so that the learning process becomes more enjoyable and easier for students to understand. This study also has implications for schools to support the integration of digital technology and social media as part of educational innovation. Schools can provide facilities and training for teachers in developing video-based and social media–based learning media so that their implementation can be carried out optimally and systematically. Furthermore, the use of social media in learning can help create a more active, collaborative, and flexible learning atmosphere, both inside and outside the classroom. For future researchers, the findings of this study may serve as a reference for developing further research related to the use of social media in other subjects, different educational levels, and other learning variables such as learning motivation, learning outcomes, and students' critical thinking skills.

DECLARATION OF GENERATIVE AI

During the preparation of this work, the author used ChatGPT to assist with paraphrasing sentences, grammar checking, and improving the clarity of the manuscript. The author also used Grammarly to assist with grammar and language editing. After using thesetools, the author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

CONFLICTING INTEREST STATEMENT

The author declares that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

FUNDING INFORMATION STATEMENT

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

AUTHORSHIP CONTRIBUTION STATEMENT

Vera Mercy Sopacua: Conceptualization, Methodology, Data Curation, Formal Analysis, Investigation, Writing -Original Draft, Visualization. Marleny Leasa: Supervision, Validation, Writing -Review & Editing. Ali Awan: Supervision, Validation, Writing -Review & Editing.

REFERENCES

Ahmed, S. K. (2024). How to choose a sampling technique and determine sample size for research: A simplified guide for researchers. *Oral Oncology Reports*, *12*, 1–7. https://doi.org/10.1016/j.oor.2024.100662

Al-Rahmi, W. M., Othman, M. S., & Musa, M. A. (2014). The improvement of students' academic performance by using social media through collaborative learning in malaysian higher education. *Asian Social Science*, *10*(8), 210–221. https://doi.org/10.5539/ass.v10n8p210

Bennett, J., Hogarth, S., Lubben, F., Campbell, B., & Robinson, A. (2009). Talking science: The research evidence on the use of small group discussions in science teaching. *International Journal of Science Education*, *32*(1), 69–95. https://doi.org/10.1080/09500690802713507

Berney, S., & Bétrancourt, M. (2016). Does animation enhance learning? A meta-analysis. *Computers & Education*, *101*, 1501–1576. https://doi.org/10.1016/j.compedu.2016.06.005

Breslyn, W., & Green, A. E. (2022). Learning science with YouTube videos and the impacts of Covid-19. *Disciplinary and Interdisciplinary Science Education Research*, *4*, 1–20.

Carrier, L. M., Rosen, L. D., Cheever, N. A., & Lim, A. F. (2015). Causes, effects, and practicalities of everyday multitasking. *Developmental Review*, *35*, 64–78. https://doi.org/10.1016/j.dr.2014.12.005

Conde-Caballero, D., Castillo-Sarmiento, C. A., Ballesteros-Yánez, I., Rivero-Jiménez, B., & Mariano-Juárez, L. (2023). Microlearning through tiktok in higher education. An evaluation of uses and potentials. *Education and Information Technologies*, *29*, 2365–2385. https://doi.org/10.1007/s10639-023-11904-4

Croker, K., Andersson, H., Lush, D., Prince, R., & Gomez, S. (2010). Enhancing the student experience of laboratory practicals through digital video guides. *Bioscience Education*, *16*(1), 1–13. https://doi.org/10.3108/beej.16.2

Dai, L., Jin, W., Zhu, B., Liao, R., Xu, G., & Jiang, H. (2025). Exploring the role of social media in mathematics learning: effects on self-efficacy, interest, and self-regulation. *BMC Psychology*, *13*, 1–19. https://doi.org/10.1186/s40359-025-03192-z

Duffy, B. E., & Hund, E. (2019). Gendered visibility on social media: Navigating instagram's authenticity bind. *International Journal of Communication*, *13*, 4983–5002.

Giannetto, D., Chao, J., & Fontana, A. (2013). Gamification in a social learning environment. *Issues in Informing Science and Information Technology*, *10*, 195–207.

Haliti-sylaj, T., & Sadiku, A. (2024). Impact of short reels on attention span and academic performance of undergraduate students. *Eurasian Journal of Applied Linguistics*, *10*(3), 60–68. http://dx.doi.org/10.32601/ejal.10306

Herpratiwi, & Tohir, A. (2022). Learning interest and discipline on learning motivation. *International Journal of Education in Mathematics, Science, and Technology*, *10*(2), 424–435. https://doi.org/10.46328/ijemst.2290

Hu, J., Lai, Y., & Yi, X. (2024). Effectiveness of social media - assisted course on learning self - efficacy. *Scientific Reports*, *14*, 1–12. https://doi.org/10.1038/s41598-024-60724-0

Jiménez, M. A. S., & Ponce, P. (2022). TikTok and youtube videos in the flipped classroom model to improve the learning process and motivate students. *The IAFOR Conference on Educational Research & Innovation*, 197–202.

Kamarudin, M. Z., & Noor, M. S. A. M. (2026). To what extent do primary school children understand photosynthesis?: a study of children's drawings with follow-up interviews. *Education 3-13*, *54*(5), 1030–1045. https://doi.org/10.1080/03004279.2024.2385434

Kehle, L., & Urhahne, D. (2026). Interest and effort in learning and performance. *British Journal of Educational Psychology*, *96*(2), 593–611. https://doi.org/10.1111/bjep.70040

Ketsman, O., Daher, T., & Colon Santana, J. A. (2018). An investigation of effects of instructional videos in an undergraduate physics course. *E-Learning and Digital Media*, *15*(6), 267–289. https://doi.org/10.1177/2042753018805594

Kohler, S., & Dietrich, T. C. (2021). Potentials and limitations of educational videos on youtube for science communication. *Frontiers in Communication*, *6*, 1–10. https://doi.org/10.3389/fcomm.2021.581302

Kopa, M. A. R., Benu, A. Y., & Bulu, V. R. (2024). The Impact of tiktok social media on science learning outcomes: A study of 5th grade students at St. Yoseph Catholic Three Elementary School in Kupang City. *Journal of Innovative Technologies in Learning and Education*, *1*(1), 73–84.

Krol, K., & Zdonek, D. (2020). Social media use and its impact on intrinsic motivation in Generation Z: A case study from Poland. *Global Knowledge, Memory and Communication*, *70*(4–5), 442–458. https://doi.org/10.1108/GKMC-08-2020-0113

Kuhlmann, S. L., Plumley, R., Evans, Z., Bernacki, M. L., Greene, J. A., Hogan, K. A., Berro, M., Gates, K., & Panter, A. (2024). Students' active cognitive engagement with instructional videos predicts STEM learning. *Computers and Education*, *216*, 1-20. https://doi.org/10.1016/j.compedu.2024.105050

Lee, L., & Tu, X. (2017). Digital media for low-income preschoolers' effective science learning: a study of ipad instructions with a social development approach. *Computers in the Schools*, *33*(4), 239–252. https://doi.org/10.1080/07380569.2016.1249742

Li, J., Snow, C., & White, C. (2014). Urban adolescent students and technology: Access, use and interest in learning language and literacy. *Innovation in Language Learning and Teaching*, *9*(2), 143–162. https://doi.org/10.1080/17501229.2014.882929

Likert, R. (1979). From production- and employee-centeredness to systems 1-4. *Journal of Management*, *5*(2), 147–156. https://doi.org/10.1177/014920637900500205

Ling, I. H., & Nasri, N. M. (2024). Increasing interest in science concepts among primary school students through tiktok. *International Journal of Academic Research in Progressive Education and Development*, *13*(4), 3223–3255. https://doi.org/10.6007/ijarped/v13-i4/23747

Mitchell, M. (1993). Situational interest: Its multifaceted structure in the secondary school mathematics classroom. *Journal of Educational Psychology*, *85*(3), 424–436. https://doi.org/10.1037/0022-0663.85.3.424

Mlambo, P. B. (2026). A descriptive study on social media as a supplementary tool for teaching and learning: first-year students' perspectives. *Discover Education*, *5*, 1–18. https://doi.org/10.1007/s44217-026-01148-y

Mohammed, I. A., & Ogar, S. I. (2023). Exploring the potential of YouTube videos towards enhancing achievement and retention of undergraduate students in environmental education. *European Journal of Interactive Multimedia and Education*, *4*(1), 1–5. https://doi.org/10.30935/ejimed/13190

Mohr, L. B. (1982). On rescuing the nonequivalent-control-group design: the random-comparison-group approach. *Sociological Methods & Research*, *11*(1), 53-80. https://doi.org/10.1177/0049124182011001003

Musfiza, L., Elizar, & Rohmani. (2025). YouTube videos as learning media to improve science learning outcomes in elementary schools: A systematic literature review. *Indonesian Journal of Educational Research and Review*, *8*(2), 569–582. https://doi.org/10.23887/ijerr.v8i2.89937

Neier, S., & Zayer, L. T. (2016). Students' Perceptions and Experiences of Social Media in Higher Education. *Journal of Marketing Education*, *37*(3), 133–143. https://doi.org/10.1177/0273475315583748

Pan, Y., Yang, K., Hong, Z., & Lin, H. (2018). The effect of interest and engagement in learning science on adults' scientific competency and environmental action the role of interest in learning science. *EURASIA Journal of Mathematics, Science and Technology Education*, *14*(12), 1-12. https://doi.org/10.29333/ejmste/94225

Putnik, G., Costa, E., Varela, L., & Shah, V. (2015). Analysing the correlation between social network network-based engineering education. *International Journal of Technology and Design Education*, *26*, 413–437. https://doi.org/10.1007/s10798-015-9318-z

Rosenthal, S. (2020). Media literacy, scientific literacy, and science videos on the internet. *Frontiers in Communication*, *5*, 1–7. https://doi.org/10.3389/fcomm.2020.581585

Saavedra, A., & Schwartz, D. L. (2026). Improving the transfer of inquiry strategies by using short instructional videos. *Educational Technology Research and Development*, 1–30. https://doi.org/10.1007/s11423-026-10648-5

Shao, F., Tang, L., & Zhang, H. (2024). Video watching and hands-on experiments to learn science: what can each uniquely contribute? *Disciplinary and Interdisciplinary Science Education Research*, *6*, 1–15. https://doi.org/10.1186/s43031-024-00103-x

Siska, W. H., & Dewi, W. (2021). Effects of ubiquitous-physics app on students' inquiry behaviors and learning achievements. *The Asia-Pacific Education Researcher*, *31*(4), 439–450. https://doi.org/10.1007/s40299-021-00585-7

Sobaih, A. E. E., Hasanein, A. M., & Elnasr, A. E. A. (2020). Responses to COVID-19 in higher education: Social media usage for sustaining formal academic communication in developing countries. *Sustainability*, *12*, 1–18. https://doi.org/10.3390/su12166520

Toli, G., & Kallery, M. (2021). Enhancing student interest to promote learning in science: the case of the concept of energy. *Education Sciences*, *11*, 1–15. https://doi.org/10.3390/educsci11050220

Trautwein, U., Lüdtke, O., Nagy, N., Lenski, A., & Schnyder, I. (2015). Using individual interest and conscientiousness to predict academic effort: Additive, synergistic, or compensatory effects? *Journal of Personality and Social Psychology*, *109*(1), 142–162.

Wibawa, I. M. C., Rati, N. W., Werang, B. R., & Deng, J. B. (2024). Increasing science learning motivation in elementary schools: Innovation with interactive learning videos based on problem-based learning. *Jurnal Pendidikan IPA Indonesia*, *13*(3), 504–513.

Yang, Y., Zhang, C., Zhang, S., & Shen, J. (2025). TikTok in higher education: A systematic review of disciplinary applications, learning outcomes, and implementation factors. *Interactive Learning Environments*, 1–21. https://doi.org/10.1080/10494820.2025.2564736

Zachos, G., & Anagnostopoulos, I. (2018). Social media use in higher education: A review. *Education Sciences*, *8*(4), 1–13. https://doi.org/10.3390/educsci8040194

Zhang, X. (2026). Leveraging social media for science education in China: teachers' integration practices, perceived benefits, and implementation barriers Leveraging social media for science education in China: *Research in Science & Technological Education*, *00*(00), 1–37. https://doi.org/10.1080/02635143.2026.2620036