

The Influence of Social Media on High School Students' Mathematics Learning Achievement: Analysis of Phase-E Students

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Abstract

Social media is often used to communicate, share information, and fill free time. Its use can affect student learning achievement, with varying impacts depending on the context and research method. The purpose of this study is to conduct an in-depth analysis related to the influence of social media use on students' mathematics learning achievement in phase-E at SMA Negeri 1 Gamping. In its implementation, this study involved 30 students selected as a sample to represent the population. This study uses a quantitative approach with a correlational method to reveal the relationship between the intensity of social media use and students' mathematics learning outcomes in more detail and objectively, the results of the analysis show a significant relationship between social media use and student learning achievement, with a calculated t value $> t$ table ($21.771 > 2.048$) and a sig. value of $0.000 < 0.05$. This indicates that the use of social media has an impact on students' mathematics learning achievement.

Keywords

Analysis, Social Media, Academic Achievement, High School



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INTRODUCTION

The development of technology in the modern era has resulted in major changes in various aspects of human life.(Adisaputro, 2020; Aminullah & Ali, 2020; Putri, 2023). Information production, previously limited to certain institutions, has now become accessible to every individual. The presence of the internet and platforms like Facebook, Instagram, and TikTok allows for seamless communication across geographic boundaries.(Fathoni & Muqorrobin, 2024; Swastiwi, 2024; Taka et al., 2025)According to Alliouli & Mourdi (2023), social media is an internet-based platform that facilitates users to share, interact, and build social connections in virtual spaces, so that its ease of access has changed human communication patterns and made information technology an integral part of modern life.(DH Siswanto et al., 2025).

Various social media platforms have unique features that attract users to spend more time in the digital world. Facebook, with its networking features, or Instagram and TikTok, which focus on visual content, have become sources of entertainment and information. The internet provides unlimited access to various websites, fulfilling needs ranging from business and hobbies to education and online transactions. Modern electronic devices such as smartphones and tablets allow people to connect anytime and anywhere (Hatmoko et al., 2024). The internet has become a basic necessity inseparable from daily routines, creating a virtual space that is an integral part of modern life.

In the world of education, information and communication technology is the main focus to support a more effective learning process.(Fathoni & Syaifuddin, 2024; Rofiq, 2019; Umami & Wahyudi, 2025)Social media plays a crucial role in opening up opportunities for collaboration between students and teachers. Yogyanto et al. (2024) demonstrated that social media can expand student networks and motivate students to learn. However, negative impacts such as reduced study time, decreased focus, and negative moral consequences must also be considered. Therefore, educational institutions play a crucial role in guiding students to use social media wisely, so that its positive impacts can be optimally utilized to support the learning process.

Media literacy has become a crucial skill for young people in this era of globalization. Suryatama et al. (2024) emphasize that media literacy helps students develop the ability to critically analyze content. This skill is crucial because information on social media is not always reliable and often contains fake news. Wahyuni et al. (2024) state that through media literacy, students not only gain global insight but also can sort out relevant and useful information. Media literacy education also serves as an effort to prevent the misuse of social media so that students can focus more on academic achievement and character development.

High school students are one of the most active groups in social media use. Tarso et al. (2024) stated that students are more susceptible to internet addiction than other age groups. This is influenced by the transition to adulthood, which is often marked by emotional and psychological instability. On the one hand, social media provides benefits by offering easy access to online literature and other learning materials. However, excessive use can lead to dependency, which affects students' mindsets and behavior.

In the context of learning, the role of teachers has undergone significant changes. Teachers are no longer merely primary sources of knowledge but also facilitators, supporting students in accessing information independently. Social media has become

a crucial tool in facilitating the exchange of academic information. Through discussion groups or online learning platforms, students can expand their communication networks, engage in discussions, and share insights with their peers.

Students at SMA N 1 Gamping, for example, demonstrate an interesting phenomenon in their use of social media. In class, students often focus more on their smartphones than on the material being presented by the teacher. A similar phenomenon is also seen in other school areas, such as the cafeteria, where direct interaction between students is often replaced by social media activities (Suryani et al., 2024). However, not all students use social media irresponsibly. Some use it to share assignments, discuss learning topics, and create positive experiences that support their academic activities.

The impact of social media on student learning has been a widely studied topic in research. Results indicate that the effects of social media can be both positive and negative, depending on the purpose and method of use. Students who use social media for academic purposes, such as completing assignments or searching for information related to their studies, tend to experience significant benefits (Widyastuti et al., 2024). However, if social media use is not managed properly, it can disrupt concentration and reduce productivity, ultimately negatively impacting learning.

The biggest challenges in using social media are the risk of addiction and impaired concentration. However, on the other hand, social media also offers significant opportunities if used wisely. Digital literacy is key to optimizing the benefits of social media while minimizing its negative impacts. With proper guidance, students can be guided to use social media productively, making it a tool that supports their learning. With proper utilization, social media has great potential to become a tool that supports the learning process in the digital age. Collaboration between students, teachers, and educational institutions is essential to creating a balanced and innovative learning ecosystem.

METHOD

This study uses a quantitative approach with a correlational method to analyze the relationship between two or more variables in a specific context. The sample was selected using the Saturation Sampling technique, involving the entire population that met the research criteria, namely 30 phase-E students of SMA N 1 Gamping. Data were collected through a five-level Likert scale-based questionnaire and analyzed using simple linear regression to identify direct relationships between independent and dependent variables. This analysis process was carried out to provide a deeper

understanding of the pattern of relationships between the variables studied and to determine whether the relationship was statistically significant or not.

RESULTS AND DISCUSSION

The purpose of this study is to analyze the influence of social media use (X) and student academic achievement (Y) using simple linear regression processed with SPSS-25 software. After the analysis process is carried out, the results of the simple linear regression are presented as in the following output. Before using the linear regression technique, a normality test was first performed with a significance level of 5%. This normality test was conducted using SPSS-25.

Table 1. Normality Test Results

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistics	df	Sig.	Statistic ^s	df	Sig.
Learning achievement	.141	30	.121	.948	30	.270
Use of social media	.128	30	.200 ^a	.949	30	.144

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on the Shapiro-Wilk test, the data on learning achievement (statistic 0.948; Sig. 0.270) and social media usage (statistic 0.949; Sig. 0.144) are normally distributed because the significance value of each is greater than 0.05. The results of the Shapiro-Wilk test indicate that the data on the learning achievement and social media usage variables are normally distributed, so the normality assumption is met. The analysis was then continued with a homogeneity test using the SPSS-25 program.

Table 2. Results of Homogeneity Test

		Levene Statistics	df1	df2	Sig.
Learning achievement	Based on Mean	.815	5	23	.517
	Based on Median	.622	5	23	.648
	Based on Median and with adjusted df	.621	5	18,177	.649
	Based on trimmed mean	.806	5	23	.522

Based on the table above, it can be concluded that the results of the homogeneity test show a significance value (sig.) of 0.517 for the relationship between social media utilization and learning achievement. Because this value is greater than 0.05, the data is considered to have a homogeneous distribution. The coefficient of determination (R

Square) is used to assess the extent to which variable X can influence variable Y. The following presents the results of the coefficient of determination (R Square) test.

Table 3. Summary of Determination Test Results Model

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.953 ^a	.908	.906	1225.38638

a. Predictors: (Constant), Use_of_social_media

b. Dependent Variable: Learning_achievement

Based on the SPSS-25 model summary shown in the table above, the coefficient of determination (R Square) value is 0.908. This indicates that in this regression model, variable X contributes 90.8% to variable Y, while the remaining 9.2% is influenced by other factors.

Table 4. ANOVA Test Results

Mode		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	711698644.162	1	711698644.162	473,969	.000 ^b
	Residual	72075445.118	48	1501571.773		
	Total	783774089.280	49			

a. Dependent Variable: Learning achievement

b. Predictors: (Constant), Use of social media

In the ANOVA table above, an analysis was conducted to determine whether variable X has a significant influence on variable Y. The output results show an F-count value of 473.969 with a probability significance level of $0.000 < 0.05$. Thus, the regression model can be used to predict variable Y. To calculate the t-table value, a two-tailed test with a significance level of 0.025 is used, and df is calculated with N-

If the calculated t value $>$ t table, this indicates a significant influence between the two variables. Conversely, if the calculated t value $<$ t table, then there is no significant influence between the two variables. This process was carried out using the SPSS-25 application to obtain the results.

Table 5. Significance Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	360,799	270,167		1,335	.188
	Use of social media	1,133	.052	.953	21,771	.000

a. Dependent Variable: Learning_achievement

From the table above, the t-count value is 21.771 with a sig. value of 0.000, the number of samples $N = 30$, df calculated as $30 - 2 = 28$. Based on the significance level of 0.025, the t-table value is 2.048. The calculation results show that the t-count value $>$ t-table ($21.771 > 2.048$) and the sig. value of $0.000 < 0.05$. Therefore, it can be concluded that there is a significant influence between the use of social media and student learning outcomes.

Discussion

With technological advancements, social media has rapidly evolved from a mere source of entertainment to a tool that supports the learning process. Not only serving as a platform for social interaction, social media now provides a variety of information relevant to learning materials. Platforms such as YouTube, Instagram, and WhatsApp are frequently used by students to search for learning materials, engage in academic discussions, and share learning resources. According to Thurston et al. (2020), social media use has been shown to impact student learning, with a high correlation coefficient of 0.908. This finding aligns with Permana et al. (2024), who stated that appropriate use of social media can improve students' understanding of learning materials.

Social media makes it easier for students to access various sources of information that were previously difficult to access (Astiwi et al., 2024). Thanks to technological advances, students can now search for and obtain explanations on various learning topics simply by accessing social media platforms. This certainly has a positive impact, as students can learn flexibly and independently. Tarso et al. (2024) emphasize that this ease of access allows students to contact their teachers or peers to discuss material they don't understand. This process helps create a more open and interactive learning environment, which in turn can improve their academic understanding.

Today, many social media platforms provide educational content that students can use to deepen their understanding of a particular subject. Platforms like YouTube, for example, offer video tutorials that can help students understand the material

taught in class. Research by Setiawan et al. (2024) and Wahyuni et al. (2024) shows that using social media as a learning resource has improved students' cognitive skills.(Setiawan & Fatmawati, 2024; Wahyuni & Adnan, 2024). Furthermore, social media provides a variety of articles, e-books, and discussion forums that can enrich students' understanding of specific topics. Therefore, the use of social media can enhance students' learning experiences outside of formal classroom hours.

Research conducted by Moghaddam & Esmaeilpour (2023) shows a significant relationship between social media use and student learning. This suggests that social media is not just a means of entertainment but can also serve as an effective learning support tool.(Morady Moghaddam & Esmaeilpour, 2023)However, as found in Hanama et al.'s (2024) research, this relationship is relatively low, with a correlation value of 0.908. This indicates that, despite its influence, social media is not the primary factor determining student learning, but rather a supporting factor in the learning process.

Many students now use social media to communicate with teachers and peers to complete assignments or share information on course material. Siswanto et al. (2024) stated that developments in information and communication technology enable globalization in learning. Online learning and social media provide flexibility for students to interact without time or place constraints.(E. Siswanto et al., 2025). Besides saving time and money, online learning also facilitates access to learning materials. Findings by Iswara et al. (2023) show that social media helps students obtain information in real time, while research by Hidayati & Yansi (2020) reveals that social media can improve student learning outcomes, particularly in finding information that supports learning.

Wise use of social media has the potential to positively impact students. Research by Sitopu et al. (2024) revealed that social media use contributes to positive improvements in student learning. Conversely, using social media for entertainment can have negative impacts, as it reduces time spent on learning activities. Therefore, students need to manage their social media use to prevent it from disrupting academic focus. A clear purpose in using social media will determine whether it has a positive or negative impact on student learning.

Relevant studies, such as those found by Asad et al. (2022), show that the influence of social media use on a person's activities is greatly influenced by the individual's personal goals.(Rini et al., 2022)If the purpose of using social media is to learn and obtain information, then the impact will be positive for learning. However, if used solely for entertainment, social media tends to reduce study time and distract

students from the material being studied. Therefore, it is important for students to be self-aware in using social media in ways that support their academic development.

One of the main benefits of using social media for learning is its flexibility. Students can access learning materials anytime and anywhere, according to their needs and convenience. This allows students to learn independently outside of formal classroom hours. With social media, students are not restricted to a specific time and place to obtain the information necessary to understand the material. This advantage greatly supports the development of more independent, technology-based learning.

Overall, social media has great potential to support student learning, especially when used wisely. Although some studies show a low correlation between social media use and learning, the positive impact of social media as a learning tool is clear. Therefore, it is important for students to use social media with clear goals, such as seeking information and engaging in discussions, so that social media can be an effective tool in enhancing learning and self-development.

CONCLUSION

Based on the results and discussion, the $t\text{-value} > t\text{-table}$ ($21.771 > 2.048$) and the sig. value $0.000 < 0.05$. Thus, the hypothesis stating that there is an influence of social media on the learning outcomes of phase E students at SMA N 1 Gamping. Based on these findings, it is recommended that teachers use the results of this study to provide insight to students.

REFERENCES

- Adisaputro, SE (2020). Human resource development in the Millennial era shapes dignified human beings. *J-KIs: Journal of Islamic Communication*, 1(1).
- Aminullah, M., & Ali, M. (2020). The Concept of Self-Development in Facing the Development of Communication Technology in the 4.0 Era. *KOMUNIKE: Journal of Islamic Broadcasting Communication*, 12(1), 1–23.
- Fathoni, T., & Muqorrobin, S. (2024). Development of the Creative Economy of the Village Karang Taruna Community Based on YouTubers and Microstokers. *Amalee: Indonesian Journal of Community Research and Engagement*, 5(1), 61–74.
- Fathoni, T., & Syaifuddin, A. (2024). Literature Review: The Urgency of Discussion and Lecture Methods in Improving Learning Outcomes in Islamic Religious Education. *FATAWA: Journal of Islamic Religious Education*, 4(2), 167–178.

- Morady Moghaddam, M., & Esmailpour, F. (2023). Persuasive language in ELT-related ads on social media. *Journal of Psycholinguistic Research*, 52(4), 1263–1288.
- Putri, RA (2023). The influence of technology on learning changes in the digital era. *Journal of Computers and Digital Business*, 2(3), 105–111.
- Rini, AD, Burhan, SY, Agusalm, L., Panjaitan, M., Purwandaya, B., Abdullah, Z., & Pasaribu, B. (2022). Women's Empowerment in the Development of Blue Economy-Based Business Models. *Karinov Journal*, 5(1), 70–74.
- Rofiq, C. (2019). Transformational leadership in madrasah educational institutions. *Journal of Religious Research*, 20(2), 203–226.
- Setiawan, S., & Fatmawati, N. (2024). The Urgency of Protecting Children's Identity Through Social Media. *AKADEMIC: Humanist Student Journal*, 4(3), 700–712.
- Siswanto, DH, Kristiawan, Y., & Zarkasyi, CN (2025). The influence of social media on mathematics learning achievement: A quantitative analysis of phase-E students. *Papanda Journal of Mathematics and Science Research*, 4(1), 49–57.
- Siswanto, E., Magriyanti, AA, & Bachtiari, A. (2025). Application of Information System Technology to Support Information and Promotion at Kaliwungu Printing. *Engineering: Journal of Engineering and Informatics*, 5(1), 36–46.
- Swastiwi, AW (2024). Globalization and Media: Convergence of Culture and Communication. PT Indonesia Delapan Kreasi Nusa.
- Taka, EL, Andung, PA, Nope, HA, Konradus, B., & Dupe, F. (2025). Transformation of Intercultural Communication on the Indonesia–Timor Leste Border Through Facebook Social Media. *KOMUNIKATIF: Scientific Journal of Communication*, 14(1), 107–1017.
- Umami, S., & Wahyudi, K. (2025). Transformational Leadership Strategies in Facing the Challenges of the Independent Learning Curriculum in Schools. *JIIP-Scientific Journal of Educational Sciences*, 8(3), 3550–3559.
- Wahyuni, S., & Adnan, MF (2024). The Influence of Social Media on Women's Political Participation in the 2024 Presidential and Vice Presidential Elections in Solok Regency. *ISO Journal: Journal of Social Sciences, Politics and Humanities*, 4(2), 13.

