Jurnal MATH-UMB.EDU
Vol. 12 (2), 2025

THE EFFECTIVENESS OF SOCIAL MEDIA UTILIZATION AS A COLLABORATIVE TOOL IN HIGH SCHOOL MATHEMATICS LEARNING

Sarwoedi[1], Idi Warsah[2], Jumira Warlizasusi[3], Adisel[4]
[1]SMAN 10 Rejang Lebong, Indonesia
[2,3]IAIN Curup, Indonesia
[3]UIN Fatmawati Sukarno Bengkulu, Indonesia
[1]sarwoedi258@gmail.com

Abstrak

Penelitian ini mengkaji efektivitas media sosial sebagai alat kolaboratif dalam pembelajaran matematika di sekolah menengah. Media sosial memungkinkan siswa untuk berkolaborasi, berbagi materi, dan terlibat dalam diskusi secara fleksibel. Dengan menggunakan pendekatan deskriptif kualitatif, subyek dalam penelitian ini adalah artikel dari jurnal nasional dan internasional yang sudah terakreditasi sebanyak 15 artikel. Penelitian ini menganalisis berbagai platform media sosial, termasuk WhatsApp, Telegram, dan Instagram, serta dampaknya terhadap motivasi, partisipasi, dan hasil belajar siswa. Hasil penelitian menunjukkan bahwa media sosial meningkatkan kolaborasi, motivasi, dan pemahaman siswa terhadap konsep matematika. Namun, terdapat tantangan seperti distraksi, penyalahgunaan platform, dan rendahnya literasi digital di kalangan siswa. Untuk mengatasi permasalahan tersebut, penelitian ini menyarankan strategi seperti pembentukan kelompok belajar yang terfokus dan pelatihan literasi digital bagi siswa dan guru. Dengan pengelolaan yang tepat, media sosial dapat secara efektif meningkatkan kualitas pembelajaran matematika di sekolah menengah.
Kata kunci: Media sosial, kolaborasi, pembelajaran matematika

Abstract

This study examines the effectiveness of social media as a collaborative tool in high school mathematics learning. Social media enables students to collaborate, share materials, and engage in discussions flexibly. Using a qualitative descriptive approach, this study analyzes fiveteen accredited national and international journal articles as its research subjects, this research analyzes various social media platforms, including WhatsApp, Telegram, and Instagram, and their impact on student motivation, participation, and learning outcomes. The results indicate that social media enhances student collaboration, motivation, and understanding of mathematical concepts. However, challenges such as distractions, platform misuse, and low digital literacy among students persist. To address these issues, the study suggests strategies such as focused learning groups and digital literacy training for students and teachers. With proper management, social media can effectively improve the quality of mathematics learning in high schools.
Keywords: *Social media, collaboration, mathematics learning*

INTRODUCTION

Social media is a product of technological and informational advancements that have become highly popular in society today. It has now become an integral part of individuals' daily lives. Various communities utilize different social networking platforms, such as virtual games, Facebook, YouTube, and others. Social media serves as a means of communication conducted online, enabling individuals to interact without spatial and temporal limitations (Sarmi, R, 2012; Hatta et al., 2022). Social media platforms offer an effective technological solution for students by providing access to valuable information and facilitating the formation of learning groups within a flexible and interactive learning environment (Mahdi, 2019). Activities such as reviewing information, commenting, classifying content, blogging, sharing, tagging, and generating new knowledge can enhance the learning experience. Numerous studies have examined both the positive and negative

effects of social media on young individuals (Mushtaq & Benraghda, 2018; Smith, 2016; Lim et al., 2014; Miss et al., 2014; Powell et al., 2012).

The existence of social media eliminates geographical and temporal barriers in communication. These platforms allow individuals to communicate anytime and anywhere, regardless of distance or specific time constraints (Sosiawan, 2020; Nugraha et al., 2022). Undeniably, social media has a significant impact on an individual's life (Putri et al., 2016; Cahyono, 2016). Someone who was previously unknown can become widely recognized through social media, and vice versa (Rafiq, 2020). For the Indonesian society, particularly among teenagers, social media has become an addiction, with no day passing without accessing social media. In fact, they are often attached to their smartphones for nearly 24 hours a day (Pratiwi, 2017).

The rapid advancement of information and communication technology has significantly influenced education. Social media, widely used for personal and professional purposes, has emerged as a potential platform for educational applications. Mathematics teachers must be aware of this shift, incorporating constructivist approaches, promoting critical thinking, and selecting suitable media and methods to enhance students' creativity in mathematics learning (Murdiana, et. al 2020). The use of learning media, particularly social media, plays a crucial role in improving learning effectiveness (Asmara & Jumri, 2023). Platforms such as WhatsApp, Telegram, Instagram, and YouTube offer significant opportunities for information sharing, communication, and collaboration.

In high school mathematics education, making abstract concepts comprehensible, motivating students, and fostering collaboration are major challenges. Mathematics, often perceived as difficult and monotonous, requires innovative and creative teaching approaches. Implementing realistic learning strategies tailored to Generation Z can positively influence student motivation (Jumri et al., 2023). Integrating social media into such strategies enhances collaboration between teachers and students.

Studies suggest that social media increases student participation, broadens access to educational materials, and creates an interactive learning environment. Boyd and Ellison (2007) describe social media as an effective tool for real-time, two-way communication that supports learning collaboration. Similarly, Gikas & Grant (2013) emphasize that social media accelerates information exchange and fosters intensive interaction among users.

However, the integration of social media in learning is not without challenges. Issues such as distractions caused by irrelevant content, misuse of social media for non-educational purposes, and l4ow digital literacy among students are common barriers that must be addressed. Thus, the application of social media in learning must be carefully planned and managed to maximize its benefits while minimizing potential drawbacks.

Social media, as defined by Boyd & Ellison (2007), are internet-based platforms that allow users to create personal profiles, interact with others, and share content. In the educational context, these platforms can serve as effective tools for communication, collaboration, and resource management. Wahyudi and Fajar (2021) note that the use of social media in education enhances flexibility in learning time and space while accelerating the dissemination of information.

Mathematics often necessitates a collaborative approach, particularly for solving complex problems that require discussion and in-depth understanding. Social media platforms such as WhatsApp provide avenues for students to engage in group discussions, share assignments, and offer prompt feedback. Telegram, with its ability to handle large file transfers, can facilitate the sharing of educational videos and digital modules.

The effectiveness of social media in education has been well-documented. Research by Sari & Hidayat (2022) highlights that social media can enhance students' motivation to learn, especially when materials are presented in visually engaging formats. Content such as videos, infographics, and interactive quizzes shared

via social media aids in making abstract mathematical concepts more comprehensible. Furthermore, a report by Statista (2023) underscores that social media supports independent learning by enabling students to access materials anytime and anywhere.

Despite these advantages, the use of social media in learning is not without its challenges. Distractions caused by notifications or irrelevant content are a significant concern (Heick, 2015). Additionally, limited digital literacy skills among students often hinder the productive use of social media in education (Wahyudi & Fajar, 2021). Consequently, clear guidelines and policies for integrating social media into educational practices are essential. This study aims to explore the effectiveness of social media as a collaborative tool in high school mathematics learning.

METHOD

This qualitative descriptive study analyzes the effectiveness of social media as a collaborative tool in high school mathematics learning. A library research method is employed, involving the collection and synthesis of data from journal articles, books, research reports, and official educational platforms.

The research design is based on library research, which involves collecting, analyzing, and synthesizing data from various secondary sources (Jumri et al., 2024). These sources include journal articles, books, research reports, and data from official platforms related to social media and education. The library research method provides an opportunity to explore various theoretical and empirical perspectives relevant to the topic without limitations of time and location.

Data sources are categorized into primary and secondary sources. Primary sources include journal articles and books discussing social media use in mathematics education. Secondary sources comprise research reports, educational publications, and statistical data from institutions such as UNESCO, Statista, and the Indonesian Ministry of Education. The study uses documentation as a data collection technique, ensuring data validity and reliability (Paulma, 2003).

Content analysis is used to process data, starting with data reduction, categorization, and thematic analysis. The findings are presented in a structured descriptive narrative, followed by interpretation to address research questions regarding social media's effectiveness in collaborative mathematics learning. Validity is ensured through source triangulation, peer review, and cross-referencing.

RESULTS AND DISCUSSION

This study reveals that social media plays a crucial role in supporting mathematics learning at the high school level. By facilitating communication, collaboration, and access to a wide range of learning resources, social media offers significant opportunities to enhance students' learning outcomes, particularly in understanding abstract concepts and practicing problem-solving.

Social media provides a flexible learning environment where students can collaborate online without the constraints of time and space. Platforms like WhatsApp, Telegram, and Google Classroom serve as effective tools for real-time communication, group discussions, Q&A sessions, and sharing learning resources. According to Sari and Hidayat (2022), WhatsApp is frequently used by teachers to coordinate group assignments, share learning materials, and facilitate online discussions. Students can easily exchange ideas through group chat features, even outside formal class hours. Telegram, with its ability to share large files, is widely used to distribute educational videos, infographics, and digital modules relevant to mathematics learning. Heick (2015) highlights that Instagram also holds significant potential in education, especially for creating visually engaging content such as mathematical formula infographics and short videos on problem-solving tips. Instagram’s live feature allows teachers to explain complex concepts interactively and address students' questions in real time. The research findings reveal that students are less inclined to adapt

to conventional learning and communication methods; however, they highly appreciate the utilization of advanced social media technology in the learning process (Sandayake, T.C, 2021).

Chugh and Ruhi (2018) on the use of Facebook in academic work, they argued that Facebook serves as an effective educational tool for the teaching and learning process. Additionally, they highlighted that peer-to-peer interactions, as well as teacher-student engagement, are enhanced through the use of Facebook. Consequently, the convenience of learning and increased student engagement have contributed to improved academic performance. Mahdi (2019) asserted that social media platforms such as YouTube, Google Plus Groups, Twitter, and Facebook can function as valuable tools for addressing students' academic challenges.

Abella-Garcia et al. (2019) conducted a study on the use of Twitter in learning, demonstrating that it enhances students' comprehension, fosters critical thinking, promotes collaborative learning, and encourages active student participation in undergraduate education. Research on the academic application of Twitter indicates that a majority of senior students communicate via Twitter and WhatsApp groups (Kimmons et al., 2017; Abella-Garcia et al., 2019). Moreover, tweets facilitate the concise delivery of information by avoiding lengthy and complex sentences typically found in fully developed paragraphs, making communication more efficient (Gatenby, 2018).

Rahmawati and Naryoso (2019) found that the impact of social media usage on students' academic achievement is more significant than the intensity of parent-child communication regarding school activities. Their study revealed that social media influences academic performance by 82.1%, whereas the effect of parent-child communication intensity related to school activities accounts for only 17.9%.

The use of social media in mathematics learning has proven to boost students' motivation and participation. Visual, interactive, and easily accessible content on social media engages students more deeply in the learning process. Gikas & Grant (2013) found that students are more motivated when given the freedom to explore learning materials through social media. This finding aligns with Wahyudi & Fajar (2021), who reported that 78% of students felt more comfortable discussing challenging concepts via social media groups compared to conventional classrooms. The Statista Research Department (2023) reported a 30% increase in conceptual understanding speed among students who used social media for mathematics learning compared to those using traditional methods. This is attributed to social media's ability to offer diverse resources tailored to different learning styles, such as video tutorials for visual learners and online discussions for auditory learners.

Despite its many benefits, using social media in learning is not without challenges. This study identified several obstacles that need to be addressed to ensure its effectiveness as a learning tool. One significant issue is distractions, as Wahyudi & Fajar (2021) found that 60% of students are distracted by irrelevant notifications, such as messages from friends or promotional ads, during learning sessions. Platform misuse is another challenge, with some students using social media for activities unrelated to learning, such as gaming or internet surfing. Additionally, Sari & Hidayat (2022) reported that around 35% of students struggle to optimize social media features for learning due to a lack of technological understanding.

To address these challenges, several strategies can be implemented. Teachers can create dedicated learning groups with clear usage rules, such as limiting discussions to learning topics. Digital literacy training for students and teachers can enhance their ability to use social media effectively for educational purposes. Parental supervision can help monitor students’ activities on social media during learning. Teachers can also integrate social media strategically into lesson plans, such as designing project-based assignments that require students to collaborate through online groups.

Social media also positively impacts conceptual understanding, social skill development, and independent learning. Collaborative discussions deepen students' mathematical comprehension, enhance

teamwork skills, and provide access to supplementary learning materials, fostering independent study habits. According to Sulistyaningsih et al. (2022), children can learn to navigate social media effectively while fostering better relationships with others. Additionally, social media can facilitate their learning process by serving as a platform for discussing school assignments with peers. The regression test results indicate that the use of social media in daily life has a significant positive effect on students' mathematics achievement (Taaraungan, F, 2022). Social media serves as a modern alternative to traditional learning tools, allowing users to share articles with commenting features, stream significant events live, conduct surveys on course materials, pose questions to a wider audience, and facilitate collaborative group interactions and communication (Abdillah, 2017; Parusheva et al., 2018). Social media can serve as an effective mechanism for alleviating frustration and boredom, as it enables individuals to share experiences and connect with their peers (Heffner, 2016). Furthermore, Mushtaq's (2018) research findings suggest that the positive impact of social media on academic activities is more significant than its negative effects, as many study participants stated that social media serves as a valuable tool in their learning process.

CONCLUSION

Based on the findings, it can be concluded that using social media as a collaborative tool in high school mathematics learning has significant positive impacts on the learning process. Social media facilitates flexible collaboration among students for group discussions, material sharing, and problem-solving. Platforms such as WhatsApp, Telegram, and Google Classroom effectively support collaboration between students and teachers, as well as among students, in understanding mathematical concepts. The use of social media in mathematics learning contributes to higher student motivation and participation. Engaging and interactive content on platforms like Instagram provides creative ways to present learning materials.

Despite its benefits, challenges such as distractions, platform misuse, and low digital literacy remain significant. These challenges require better management by teachers and the provision of digital literacy training for students. To optimize the use of social media, strategies such as forming focused learning groups, providing digital literacy training, parental supervision, and integrating social media into lesson plans should be implemented. Furthermore, the use of social media in mathematics learning enhances conceptual understanding, fosters the development of social skills, and provides access to enriched learning resources, enabling students to learn more independently and comprehensively.

REFERENCE

Abdillah, L. A. (2017). Exploring Students Blended Learning Through Social Media. ComTech (Computer, Mathematics and Engineering Applications), 7(4), 245-254. https://doi.org/10.21512/comtech.v7i4.2495

Abella-Garcia, V., Delgado-Benito, V., Ausin-Villaverde, V., & Alcala, D.H. (2019). To tweet or not to tweet: Student perceptions of the use of Twitter on an undergraduate degree course. Innovations in Education and Teaching International, 56(4), 402- 411. https://doi.org/10.1080/14703297.2018.1444503

Asmara, A,. & Jumri, R. (2024). Media Pembelajaran Matematika. PT. Mafy Media Literasi Indonesi. Sumatera Barat.

Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1), 210-230.

Cahyono, A. S. (2016). Pengaruh media sosial terhadap perubahan sosial masyarakat di Indonesia. Publiciana, 9(1), 140-157.

Chugh, R., & Ruhi, U. (2018). Social media in higher education: A literature review of Facebook. Education Information Technology, 23, 605–616.

https://doi.org/10.1007/s10639-017-9621-2

Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *The Internet and Higher Education*, 19, 18-26.

Hatta, H. R., Hairah, U., Mardais, M., Diyana, W. N. R., Irvansyah, M., Sadanu, A. I., & Mujiono, M. N. A. (2022). Pelatihan penggunaan instagram sebagai media promosi bagi warga dusun rejosari kalimantan timur. J-MAS: Jurnal Pengabdian Masyarakat, 1(2), 213-216.

Jumri, R., Heswari, S., Hadi, K.A., Yuda. R.K., Meirani M., Kalsum, U. 2024. Metodologi Penelitian. PT. Penamuda Media. Yogyakarta.

Jumri, R., Risnanosanti., Ramadhani, W., Syofiana, M. 2023. Korelasi antara Realistic Mathematic Education dan Self Regulated Learning Siswa dalam Pembelajaran Matematika. https://scholar.google.co.id/citations?view_op=view_citation&hl=id&user=iGyPQTAAAAAJ&pagesize=80&citation_for_view=iGyPQTAAAAAJ:Se3iqnhoufwC. 21-28.

Heffner, T. (2016). The effects of social media use in undergraduate students [Masters Dissertations, Rowan University]. http://rdw.rowan.edu/etd/1440

Heick, T. (2015). 9 characteristics of 21st century learning. https://www.google.com/search?q=Heick%2C+T.+(2015).+9+characteristics+of+21st+century+learning.+Retrieved+Dec+15%2C+2019+from+https%3A%2F%2Fwww.teachthought.+com%2Flearning-models%2F9-characteristicsof-21st-century-learning%2F&sourceid=chrome&ie=UTF-8&safe=active&ssui=on

Kimmons, R., Veletsianos, G., & Woodward, S. (2017). Institutional Uses of Twitter in U.S. Higher Education. Innovative Higher Education, 42, 97–111. https://doi.org/10.1007/s10755-016-9375-6

Lim, M. S. C., Vella, A., Sacks-Davis, & Hellard M. E. (2014). Young people's comfort receiving sexual health information via social media and other sources. International Journal of STD and AIDS, 25(14), 1003-1008. https://doi.org/10.1177/0956462414527264

Mahdi, M. A. (2019). Undergraduate Students' Perceptions toward Social Media Usage and Academic Performance: A Study from Saudi Arabia. International Journal of Emerging Technologies in Learning, 14(3). https://doi.org/10.3991/ijet.v14i03.9340

Miss, E. H. N., Obiora, O. C., Odoh, & Miss, J. N. (2014). The Use of Social Networking Sites among the Undergraduate Students of University of Nigeria, Nsukka. Library Philosophy and Practice, 1195. http://digitalcommons.unl.edu/libphilprac/1195

Murdiana., Jumri, R., Bobby (2020). Pengembangan Kreativitas Guru dalam Pembelajaran Matematika. Jurnal Pendidikan Matematika Raflesia. https://ejournal.unib.ac.id/jpmr/article/download/11450/5755/27189

Mushtaq, A, J., & Benraghda, A. (2018). The Effects of Social Media on the Undergraduate Students' Academic Performances. Library Philosophy and Practice, 1779. https://digitalcommons.unl.edu/libphilprac/1779

Nugraha, H., Kurniawansyah, K., & Ediansa, O. (2022). Pemahaman Mengenai Pentingnya Media Sosial Dalam Pelayanan Kesehatan Pada Klinik Basmallah Jambi. SINAR SANG SURYA: Jurnal Pusat Pengabdian Kepada Masyarakat, 6(1), 190-198.

Parusheva, S., Aleksandrova, Y., & Hadzhikolev, A. (2018). Use of Social Media in Higher Education Institutions – an Empirical Study Based on Bulgarian Learning Experience. TEM Journal, 7(1), 171-181. https://doi.org/10.18421/TEM71-21

Powell, D. A., Jacob, C. J., & Chapman, B. J. (2012). Using Blogs and New Media in Academic Practice: Potential Roles in Research, Teaching, Learning, and Extension. Innovative Higher Education,

37, 271–282. https://doi.org/10.1007/s10755-011-9207-7

Pratiwi, N. I. (2017). Penggunaan Media Video Call dalam Teknologi Komunikasi. Jurnal Ilmiah Dinamika Sosial, 1(2), 20-224. https://journal.undiknas.ac.id/index.php/fisip/article/view/219

Putri, W. S. R., Nurwati, N., & Budiarti, M. (2016). Pengaruh media sosial terhadap perilaku remaja. Prosiding Penelitian dan Pengabdian kepada Masyarakat, 3(1).47-51. http://dx.doi.org/10.24198/jppm.v3i1.13625

Rahmawati, W. H., & Naryoso, A. (2019). Imbas Intensitas Penggunaan internet dan Intensitas Komunikasi Orang Tua Anak Terkait Aktivitas Sekolah Terhadap Prestasi Belajar Peserta Didik Pedesaan. Hubungan Online, 7(4), 1–11. https://ejournal3.undip.ac.id/index.php/hubungan-online/article/view/24194

Rafiq, A. (2020). Dampak Media Sosial Terhadap Perubahan Sosial Suatu Masyarakat. Global Komunika, 1(1), 18-29.

Sandanayake, T.C. (2021). Enhancing Students' Performances by Integrating Social Media in Undergraduate Learning. International Journal of Learning, Teaching and Educational Research Vol. 20, No. 4, pp. 43-60, April 2021 https://doi.org/10.26803/ijlter.20.4.3

Sari, N. P., & Hidayat, W. (2022). Pemanfaatan media sosial sebagai media pembelajaran matematika di masa pandemi. *Jurnal Pendidikan Matematika*, 6(2), 123-135.

Sarmi Rafi. (2012). Media sosial. Http://Www.Unpas.Ac.Id/Apa-Itu-Media-Sosial.

Sosiawan, E. A. (2020). Penggunaan situs jejaring sosial sebagai media interaksi dan komunikasi di kalangan mahasiswa. Jurnal Ilmu Komunikasi, 9(1), 60-75.

Statista Research Department. (2023). Social media usage in education: Current trends and statistics. *Statista*. https://www.statista.com/topics/11170/online-education-in-indonesia/#topicOverview

Sulistyaningsih, M., Mangelep, N. O., & Kaunang, D. F. (2022). Efektivitas Penggunaan E-Learning Pada Pembelajaran Matematika Dengan Pendekatan *Problem Posing.* Gammath: Jurnal Ilmiah Program Studi Pendidikan Matematika, 7(2), 105-114.

Taaraungan, F. (2022). Pengaruh Penggunaan Media Sosial Pada Kehidupan Sehari-hari Terhadap Prestasi Belajar Matematika Peserta Didik. Jurnal Pendidikan Sosial dan Humaniora.https://publisherqu.com/index.php/pediaqu/article/view/32/15

Wahyudi, S., & Fajar, T. (2021). Media sosial dan efektivitas pembelajaran daring: Sebuah tinjauan. *Jurnal Teknologi Pendidikan Indonesia*, 12(3), 78-89.