

An Analysis of Digital Learning Media Utilization in Social Studies Education from Peusangan District Junior High Schools

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Abstract

Supporting the 24th-century learning process requires the utilization of digital-based learning resources. However, several issues persist in its implementation within Social Studies (IPS) instruction in junior high schools (SMP), particularly regarding the availability of resources and facilities. This study aims to examine how digital-based learning resources are utilized in Social Studies classrooms across seven public junior high schools in Peusangan District and to identify the internal and external factors influencing this utilization. This study employs a case study method with a qualitative approach. Data were collected through observations, interviews, and documentation from Social Studies teachers. The findings indicate the integration of digital media in the learning process, including educational films, interactive PowerPoint presentations, and various learning tools. The deployment of these technologies renders learning more dynamic, simplifies information delivery, and enhances student engagement. Nonetheless, infrastructural constraints, a lack of training, and disparities in teachers' digital competencies have hindered optimal implementation. The results suggest that maximizing the use of digital-based learning materials in Social Studies instruction requires strengthening school policies, improving teachers' digital skills, and enhancing infrastructure support..

Keywords: Digital learning media; Social studies learning; Teacher digital competence; Interactive media; Case study.

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INTRODUCTION

Education is one of the many aspects of life that has undergone massive transformations as a result of advancements in information and communication technology. The shift in educational paradigm from teacher-centered to student-centered learning is driven by the digital revolution. In this perspective, technology functions not merely as a communication tool, but as a medium that helps render learning more efficient, interactive, and aligned with the needs of 21st-century learners. By utilizing digital-based learning media, teachers can provide instructional materials in various formats, including educational videos, digital presentations, educational applications, and other interactive media that can enhance student engagement in the learning process (Nurhasanah, Handoyo, Widiyatmoko, & Rusdart, 2025).

Teachers can present content more systematically and clearly by utilizing learning media. Students' focus, interest, and comprehension of the subject matter can be enhanced through the appropriate use of media. Learning media constitutes anything that can be used to convey messages and stimulate students' attention, interest, thoughts, and learning capacity (Suyahman, Pattiruhu, Zuhriyah, Rintaningrum, & Manyullei, 2024). Consequently, the utilization of digital learning resources is highly essential to develop engaging, creative, and meaningful learning experiences.

Numerous studies have demonstrated the beneficial effects of utilizing digital learning resources on students' learning processes and outcomes. The use of digital media can enhance student engagement and participation in the educational process (Gan, Menkhoff, & Smith, 2015). These findings indicate that digital media generates a more dynamic and interactive learning environment, in addition to serving as a medium for content delivery. Nonetheless, most research continues to concentrate on the impact of digital media usage on student learning outcomes, with very few studies examining the variables that influence the actual utilization of digital media in education.

Social Studies (IPS) is one of the disciplines that requires creative content delivery. Various social, cultural, economic, and sociological phenomena are studied within the field of social sciences. When social science instruction is limited to lectures, students often find it difficult to grasp the conceptual and theoretical aspects of the subject. Consequently, it is believed that the use of digital-based learning resources can assist educators in presenting content in a manner more relevant to students' daily lives through the use of images, videos, music, animations, and simulations.

The use of technology-based interactive learning materials in social studies classrooms helps enhance students' interest and understanding of the subject matter (Suharsiw, Usmiyatun, & Siddique, 2023). Furthermore, digital media can provide students with a more contextual learning experience, which facilitates comprehension of the topics taught. According to another study, the use of educational films can enhance students' understanding of social studies content by making presentations more engaging, comprehensible, and clear (Jibililu, 2024). Therefore, digital media possesses immense potential to deliver more efficient and significant social studies education.

The demands of 21st-century education, which highlight the importance of digital literacy, creativity, communication, teamwork, and critical thinking skills, align with the use of digital-based learning materials (Lee, Tazijan, Adam, Ikhsanudin, & Bakar, 2025). Within this context, teachers must successfully integrate technology into the educational process (Rosyidah, Supriyanto, & Mustiningsih, 2025). Learning technology is highly critical to enhance learning effectiveness and foster a more creative learning environment. Consequently, the effectiveness of integrating digital media into the teaching and learning process heavily relies on the digital competence of the educators (Ossiannilsson, 2019).

For digital technology to advance in education, teachers must not only have access to technological devices but also be prepared to integrate technology into the classroom (Mane, 2025). TPACK is one of the frameworks frequently used to describe the effectiveness of technology integration in education (Jibril & Adedokun-Shittu, 2024). This paradigm highlights that the efficacy of technology

use depends not only on technological competence but also on the educator's capacity to simultaneously integrate pedagogy, learning materials, and technological knowledge (Tondeur, Scherer, Siddiq, & Baran, 2020). Dengan demikian, keber. Therefore, the effectiveness of digital media utilization in social studies education depends not only on the accessibility of technical resources but also on the educators' proficiency in managing technology-based instruction.

Research indicates that digital learning can enhance student motivation and foster a more engaged learning environment. However, several constraints remain in the use of digital media in schools, including inadequate technological infrastructure, internet access, and disparities in teachers' digital skills. Furthermore, while some educators are still limited to using basic digital media, others have been permitted to utilize interactive learning tools such as Quizizz and interactive PowerPoint.

Although the contribution of digital learning media in boosting student motivation, engagement, and academic achievement has been widely validated by prior literature, research attention thus far remains heavily dominated by evaluating the direct impact on learners. The majority of these studies rely on quantitative methodologies to measure technological efficiency regarding students' cognitive and psychological performance. Conversely, a comprehensive investigation into how educators integrate these digital tools into daily instructional dynamics, particularly within the realm of social studies, is still remarkably scarce. In fact, successful technology integration does not solely depend on student learning outcomes; it is also accelerated by teacher competence, infrastructural support, and the school ecosystem as a whole.

In addition, literature highlighting the adoption of digital media in social studies instruction at the junior high school level—particularly in regions with limited access to technology—still leaves a wide gap. Previous studies tend to orient toward the end results of utilization without mapping the internal and external determinants that condition the success of such implementation. This phenomenon leads to a lack of a complete picture regarding the alignment of actual strengths, limitations, opportunities, and constraints in the field. To address this void, this study aims to elaborate on the utilization of digital media in social studies using a SWOT analysis framework, thereby not only presenting a holistic mapping of current conditions but also formulating tactical recommendations for the future optimization of technology-based social studies learning.

Referring to the discussion above, the urgency of this study lies in its ability to contribute new empirical evidence regarding the utilization of digital instructional media in social studies, particularly in areas with limited technological infrastructure. The outcomes of this research are projected not only to expand the body of literature on educational digitalization at the junior high school level but also to serve as a reference foundation for schools and policymakers in formulating programs to enhance educators' digital competence and optimize supporting facilities for technology-based learning.

Nonetheless, the use of digital media in social studies lessons has been well-received by students. The utilization of digital media increases enthusiasm students toward learning activities and makes the learning process more engaging and easier to comprehend. When learning with digital media, students are more likely to

participate actively in the learning process compared to when they learn through traditional methods.

This description serves as the foundation for the research objectives, which include analyzing the utilization of digital-based learning materials in Social Studies subjects across public junior high schools (SMP Negeri) in Peusangan, identifying internal and external factors influencing their implementation through a SWOT analysis, and examining their contribution to the development of active, interactive, and student-centered learning.

RESEARCH METHOD

This research applies a qualitative approach utilizing a multiple case study design to examine the integration of digital-based learning media in social studies instruction across public junior high schools (SMP Negeri) within the Peusangan District. This methodological framework was adopted because the investigation was conducted across seven educational institutions, each possessing distinct characteristics in terms of technological facility availability, internal school conditions, and educators' track records in operating digital instruments. The selection of these seven research loci was carried out through a purposive sampling technique, focusing on ongoing digitalization programs to provide a comprehensive overview of technology utilization typologies and the determinants conditioning implementation across diverse school settings. Through this multiple case study orientation, cross-case analysis can be optimally executed to map out commonalities and disparities in findings at each school, ultimately fostering a far more comprehensive understanding of the empirical phenomenon under study (Chesebro & Borisoff, 2007).

The research was conducted at SMP Negeri 1–7 in Peusangan District, Bireuen Regency, during the second half of the 2025–2026 academic year. The schools involved are: SMPN 1 Peusangan, SMPN 2 Peusangan, SMPN 3 Peusangan, SMPN 4 Peusangan, SMPN 5 Peusangan, SMPN 6 Peusangan, and SMPN 7 Peusangan. The subjects of this study are Social Studies teachers who have implemented the use of digital learning tools in their classrooms. A purposive sampling strategy was employed to select informants believed to possess firsthand knowledge of, or active participation in, the use of digital learning media within educational settings.

This study utilizes both primary and secondary sources for its data. Observations, semi-structured interviews, and written records serve as the primary sources of information. The focus of the observations is the use of digital learning tools by students in Social Studies classrooms. Teachers' utilization of digital media, students' reactions to it, and the difficulties encountered during implementation were all investigated through interviews. The data gathered from interviews and observations were supported and complemented by documentation. Secondary sources used to compile the dataset included books, scientific journals, school records, and other archives.

The researchers serve as the primary instrument in this study because they are directly involved in data collection and analysis. Interview protocols, observation sheets, and other forms of documentation were utilized to assist the researchers in this endeavor. The purpose of using multiple instruments was to gather more

detailed information on how students utilize digital learning resources for Social Studies.

According to the model by Miles and Huberman (Onwuegbuzie & Weinbaum, 2016), data are collected, condensed, displayed, and conclusions are drawn during interactive data analysis. We classified and categorized data from interviews, observations, and documents based on shared significance. After grouping the responses into these categories, we identified common themes regarding the integration of digital resources into the Social Studies curriculum.

Furthermore, a SWOT analysis was used to categorize the results of the thematic analysis to achieve a more comprehensive understanding. To better comprehend the internal elements (strengths and weaknesses) and external elements (opportunities and threats) affecting the use of digital learning media for Social Studies instruction, a SWOT analysis was applied. By breaking down the use of digital media into its component parts, this study does not merely catalogue them; it also delves into the driving and restraining forces behind their utilization in educational environments.

Source triangulation and technical triangulation ensure the validity of the data used in this study. The process of source triangulation involves comparing data collected from multiple sources, whereas technical triangulation involves comparing data gathered through interviews, observations, and documentation. Credibility, transferability, dependability, and confirmability were also taken into account in this study to enhance the reliability of the research findings (Donkoh & Mensah, 2023).

RESULTS AND DISCUSSION

This study involved 14 Social Studies teachers from seven public junior high schools (SMP Negeri) in Peusangan District as research informants. Data were gathered through observations, semi-structured interviews, and documentation to analyze the utilization of digital-based learning media in Social Studies instruction. The results indicate that the majority of teachers have utilized various digital-based learning media, such as educational videos, PowerPoint (PPT), Quizizz, and interactive PowerPoint in the learning process. The utilization of these media has had a positive impact on student learning motivation, participation, and instructional effectiveness. Nonetheless, its implementation still faces several constraints, including limited technological facilities, unstable internet access, and disparities in teachers' digital competencies.

Based on the data analysis, four major themes emerged from the research findings. One fundamental concept is the integration of online resources into the social studies curriculum. The effectiveness of digital media-based learning and student engagement constitute the focus of the second theme. The third subject addresses the various constraints faced by educators when incorporating digital learning materials into their lessons. As for the fourth subject, it details the findings of a SWOT analysis examining the pros and cons of utilizing digital learning materials for Social Studies education. To better understand how public junior high schools in Peusangan District have utilized digital media for teaching social studies, this article further discusses these four issues.

The Utilization of Digital-Based Learning Media in Social Studies Instruction

Empirical findings confirm that the majority of social studies educators in public junior high schools (SMP Negeri) within the Peusangan District have integrated digital-based learning instruments into their instructional activities. Conventional media such as educational videos and PowerPoint (PPT) presentations dominate the frequency of use, while some teachers have begun exploring more interactive platforms like Quizizz and interactive PowerPoint. Collectively, all of these educational institutions have adopted digital technology in social studies learning, despite showing disparities in the dimension of intensity and variety of application. Accessibility during the preparation phase, operational ease, and compatibility with the nature of social studies content—which encompasses clusters of social, economic, historical, and geographical concepts—serve as the primary determinants behind selecting these media. The utilization of these digital tools enables teachers to systematically restructure material through a combination of text, image representations, visual illustrations, charts, and contextual video clips.

Referring to the results of in-depth interviews and field observations, educational videos occupy the position as the medium with the highest penetration because they are deemed effective in facilitating the visualization of abstract concepts into more concrete forms for learners. Aligned with this, one of the informants (MS) explained that

“penggunaan video pembelajaran membuat siswa lebih mudah memahami materi karena mereka dapat melihat contoh secara langsung.”

These results indicate that visual representation through digital devices facilitates students in correlating abstract theoretical concepts in social studies with empirical realities in their daily environments. Within the scope of social studies education, the capacity of digital media to visually present various social dynamics becomes a crucial element in accelerating students' deep understanding of the subject matter.

Alongside the use of educational videos, PowerPoint continues to hold a central role as the primary instrument for the majority of educators in organizing and systematically transmitting instructional content. Nevertheless, the reality on the ground reveals practical variability in the adoption of this digital technology among teachers and school institutions alike. Some educators merely utilize digital media as an expository tool (material presentation), while others have gone a step further by synchronizing digital devices into discussions, assignments, and learning assessment instruments. In school ecosystems with superior technological facility availability, the diversification and interactivity of digital media usage appear far more prominent. Conversely, in educational institutions with limited supporting infrastructure, technology utilization patterns remain centered on conventional PowerPoint presentations and standard educational video playbacks.

Several teachers have also been identified as utilizing the Quizizz platform and interactive PowerPoint as means of evaluation as well as material enrichment. Aligned with this phenomenon, according to informant (F):

“siswa lebih semangat ketika menggunakan Quizizz karena belajar terasa seperti bermain sambil belajar.”

The results of this research indicate that the intensity and optimization of digital media utilization are not solely determined by the availability of school technological facilities; rather, they are also accelerated by educators' self-efficacy and digital competence in constructing and synchronizing innovative instructional media to meet the demands of social studies education.

The findings of this study align with various international researches demonstrating that the utilization of digital media enhances the quality of students' learning experiences through more visual, interactive, and contextual material presentations. Research explains that the use of digital technology in learning can increase student engagement when supported by adequate teacher digital competence (Chiu, 2021). Furthermore, it is known that technology integration in learning provides opportunities for teachers to develop more innovative and student-centered learning strategies (Laid & Adlaon, 2025). Similar findings also state that the use of digital media integrated with appropriate pedagogical approaches can significantly improve the quality of instruction and students' learning experiences (Abri, Aamri, & Elhaj, 2024).

From a TPACK perspective, "the utilization of digital media by Social Studies teachers demonstrates an effort to simultaneously integrate aspects of technology, pedagogy, and learning content. Teachers do not merely use technology as a presentation aid, but also utilize it to help students comprehend Social Studies material through visualization, simulation, and more interactive learning activities. Thus, the use of digital-based learning media in this study indicates that technology has become an essential component in supporting a more effective, engaging, and student-centered Social Studies learning process.

Based on the research results, it can be concluded that educational videos, PowerPoint, Quizizz, and interactive PowerPoint presentations are the digital media most widely used by Social Studies teachers in Public Junior High Schools within Peusangan District. The utilization of these media helps teachers present materials more attractively, improves student comprehension of the learning content, and supports the creation of a more interactive and meaningful learning experience.

Student Engagement and Learning Effectiveness Through Digital Media

Evidently, students demonstrate higher engagement in their social studies education when digital learning resources are implemented. Students appear to be more involved in class discussions, asking and answering questions when instructors utilize educational videos, interactive PowerPoint presentations, and Quizizz, compared to when lectures are delivered traditionally. Furthermore, with visually appealing and informative content, students tend to be more actively involved in the learning process.

According to teacher interviews, the use of digital media renders the classroom environment more engaging and less monotonous. Students show higher engagement when they learn through visual aids—such as displays, images, videos, and interactive activities—in addition to listening to the teacher's explanations. Consequently, students are motivated to be more involved in their learning.

Moreover, studies have shown that digital media can enhance learning effectiveness. Educators have demonstrated that students retain more information when presented with multimedia elements such as films, photos, animations, and

interactive quizzes. Students are able to recall more of what they have learned due to the use of attention-grabbing visual and auditory representations.

These findings are consistent with research indicating that the use of digital technology in learning contributes to increased student engagement through more active interactions among students, teachers, and the learning materials (Wibowo, Karim, Hasan, & Hamid, 2023). In addition, other studies mention that technology-based learning environments are capable of enhancing student motivation and participation because they provide a more interesting and meaningful learning experience (Tsai, Shen, Chen, Hsu, & Tsai, 2020). Furthermore, the use of interactive digital media positively influences student engagement as well as the quality of the classroom learning experience (Yulhendri, Mardhotillah, Alisha, & Susanti, 2022).

From a TPACK perspective, the increase in student engagement indicates that teachers have been able to leverage technology to support learning strategies that match the characteristics of Social Studies content. The integration of technology, pedagogy, and content allows the learning process to become more interactive and student-centered.

Based on the research results, it can be concluded that the use of digital-based learning media contributes positively to student engagement and the effectiveness of Social Studies instruction. Students become more active, motivated, and easily comprehend the material, allowing the learning process to run more effectively compared to conventional learning methods.

Challenges in the Implementation of Digital-Based Learning Media

Despite offering various benefits, the implementation of digital-based learning media in Public Junior High Schools within Peusangan District still faces several constraints. The research results indicate that limited technological facilities constitute the primary obstacle in executing digital-based learning. Several schools still have a limited number of projectors, requiring teachers to use them on a rotational basis.

One of the informants (SL) stated that:

“penggunaan proyektor masih harus bergantian karena jumlah fasilitas di sekolah masih terbatas.”

In addition to device limitations, unstable internet access also poses a challenge when teachers intend to utilize online-based learning applications. This condition prevents the digital learning process from being carried out optimally at all times.

The findings of this study align with prior research stating that teachers' digital competence is one of the primary factors determining the success of technology integration in education (Althubyani, 2024). Furthermore, infrastructural constraints and a lack of institutional support constitute frequent barriers faced by schools when implementing educational technology (Ntorukiri, Kirugua, & Kirimi, 2022). Additionally, another study explains that the development of teachers' digital competence must be conducted sustainably to ensure technology integration runs effectively (Nurhidayat, Mujiyanto, Yuliasri, & Hartono, 2024).

Within the TPACK (Technological Pedagogical Content Knowledge) framework, the challenges identified in this study demonstrate that successful technology integration depends not only on the availability of technological devices

but also on teachers' ability to combine technological, pedagogical, and content knowledge. Consequently, enhancing teachers' digital competence has become an urgent and vital necessity.

Based on the research results, it can be concluded that “the primary challenges in implementing digital-based learning media include limited technological facilities, unstable internet access, and disparities in teachers' digital competence.” These three factors represent critical aspects that must be addressed to support the optimization of digital-based learning in schools.

SWOT Analysis of Digital-Based Learning Media Utilization

Referring to the results of the evaluation based on the SWOT framework, the integration of digital learning instruments in social studies instruction across public junior high schools (SMP Negeri) within the Peusangan District is conditioned by a series of internal and external determinants. The internal dimension encompasses aspects of strengths and limitations (weaknesses), while the external realm represents aspects of opportunities as well as challenges (threats). The results of this comprehensive reconstruction and mapping of all variables are systematically summarized in Table 1.

Table 1. SWOT Analysis Results on the Utilization of Digital-Based Learning Media

Strengths (S)	Weaknesses (W)
Enhancing student learning motivation	Limited technological facilities
Increasing student participation	Unstable internet access
Aiding the visualization of social studies material	Varied teacher digital competence
Creating more interactive learning	Not all teachers are capable of developing interactive media
Opportunities (O)	Threats (T)
Advancements in educational technology	Infrastructure gaps between schools
Availability of digital learning platforms	Low digital competence among some teachers
Policy support for digital transformation	Rapid technological changes
Increasingly widespread access to digital learning resources	Disparities in learning quality

Referring to the data presented in Table 1, the fundamental advantage of integrating digital-based instructional media lies in its capacity to escalate student learning motivation, active engagement, and the intensity of two-way communication within the classroom. The application of digital tools such as educational video clips, PowerPoint, and Quizizz has proven capable of stimulating a more dynamic learning atmosphere, which in turn encourages students to participate more intensively. Furthermore, this digital technology serves as a mediating instrument for teachers to transform social studies material—which is laden with abstract theoretical concepts—into far more concrete visual representations.

Despite offering various advantages, the implementation of these digital instruments is in reality still hindered by a number of internal constraints. A deficit in technological infrastructure, fluctuations in internet network stability, and disparities in digital proficiency among educators prevent the optimal actualization of these technology-based media across the school ecosystem. Consequently, a significant imbalance emerges in both the frequency and diversification of digital device utilization within social studies instruction.

Examined from a prospective vantage point, the accelerated innovation within the realm of educational technology provides ample space for educational institutions to explore a wide array of digital instructional platforms, educational software, and online learning databases. The abundance of alternative learning resources facilitates teachers in formulating more contemporary, adaptive pedagogical methodologies that align with the competency characteristics required by students in the modern era.

Conversely, the uneven distribution of technological facilities across schools, combined with low digital literacy among some teaching staff, poses a serious external barrier to the migration toward a digital ecosystem. If these structural issues are not addressed through comprehensive and sustainable policy interventions, it is feared that the polarization of learning quality and standards between schools will widen further.

Table 2. Formulation of Development Strategies Based on SWOT Analysis

Strategy	Strategy Formulation
SO	Accelerating the expanded adoption of digital media in social studies learning by collaborating students' passion for learning with innovation trends in educational technology.
WO	Escalating educators' digital proficiency through intensive training programs and clinical supervision in the operation of technology-based instructional media.
ST	Optimally exploring existing digital devices to reduce the negative impacts of the uneven distribution of technological facilities between schools.
WT	Reconstructing basic technological infrastructure while simultaneously promoting comprehensive and continuous teacher competence enhancement programs.

The findings of this study are consistent with research asserting that “successful technology integration requires a balance between technological, pedagogical, and instructional content aspects (Okojie, Olinzock, & Okojie-Boulder, 2006). Moreover, other literature explains that the utilization of educational technology yields optimal results when supported by teacher competence and an adequate learning environment (Angeli, 2005). Furthermore, other studies emphasize that institutional support and teacher professional development are crucial factors in the successful implementation of educational technology (Theodorio, 2023).

The SWOT analysis indicates that the positive impacts of using digital learning resources outweigh the negative ones. However, to maximize digital media in the classroom, well-equipped classrooms, enhanced digital competence among teachers, and regulations that promote the continuous use of technology in the classroom are strictly required.

CONCLUSION

This study analyzed the utilization of digital-based learning media in Social Studies instruction across seven public junior high schools in Peusangan District, involving 14 Social Studies teachers as research informants. Based on the research results, four primary findings were obtained.

First, the utilization of digital-based learning media in Social Studies instruction has been implemented by most teachers, although the degree of utilization varies. The most widely used media are educational videos and PowerPoint (PPT), whereas more interactive media such as Quizizz and interactive PowerPoint are only utilized by a fraction of the teachers. The use of media

Digital media assists teachers in presenting Social Studies material in a more systematic, concrete, and engaging manner, thereby facilitating students' understanding of the instructional content.

The second benefit is that students are more engaged and learn more effectively when utilizing digital-based learning tools. The integration of digital media in the classroom yields several advantages, including heightened student enthusiasm for learning, greater participation in classroom discussions and inquiries, and a generally optimistic attitude toward education. These findings indicate that digital media can foster a more engaging, interactive, and student-centered learning environment.

Third, numerous constraints remain to be addressed when implementing digital-based learning media, such as the lack of adequate technology, unreliable internet connectivity, and disparities in educators' digital competencies. The availability of technological devices and the proficiency of educators to utilize them successfully are the two most critical factors determining the effectiveness of technology integration within this educational context.

Fourth, according to the SWOT analysis, the positive aspects of utilizing digital-based learning resources outweigh the negative ones. The future prospects for social studies education are promising, driven by advancements in educational technology that have the potential to enhance students' intrinsic motivation to learn, their level of classroom engagement, and their collaborative skills. Regrettably, there remains an urgent need to overcome obstacles related to inadequate technological infrastructure and the lack of digital competence among certain educators.

Overall, the research findings suggest that social studies education will significantly benefit from the adoption of digital-based learning materials. Technological affordability, continuous professional development for educators in digital literacy, and supportive school policies that encourage classroom technology utilization are all essential for a seamless implementation. Consequently, to ensure that digital-based learning tools are utilized optimally and sustainably, schools must develop their technological infrastructure and facilities while organizing continuous training programs.

Given that this study only involved Social Studies instructors from seven public junior high schools (SMPN) in Peusangan District, the findings may not be generalizable to other regions. Therefore, it is recommended that future studies involve students, school principals, and education officials to investigate the long-term effects of digital-based learning media on students' digital literacy and academic outcomes.

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