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THE ROLE OF TECHNOLOGY AND DIGITAL LITERACY IN IMPROVING STUDENT LEARNING MOTIVATION: A LITERATURE REVIEW 2021-2025

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Abstract

This study aims to analyze trends, directions, and research findings highlighting the relationship between technology utilization, digital literacy, and learning motivation in the context of modern education. The method used was a systematic literature review, referring to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Of the 1,195 articles identified through various databases and research registers, 53 articles met the inclusion criteria and were analyzed in depth using a descriptive and thematic approach. The study results indicate that digital literacy plays a crucial mediating factor in optimizing the use of technology to enhance student learning motivation. The use of digital media, online learning platforms, and artificial intelligence (AI)-based technology has been shown to strengthen student engagement, increase curiosity, and foster learning independence. Furthermore, the application of technology also encourages the formation of a flexible and learner-centered learning ecosystem. This study recommends strengthening digital literacy, improving teachers' pedagogical and digital competencies, providing supporting infrastructure, and implementing differentiated learning strategies oriented toward motivation, creativity, and active student participation in the digital era.

Keywords: Learning Motivation, Digital Literacy, Technology

INTRODUCTION

The development of information and communication technology (ICT) in the last two decades has fundamentally changed the way humans learn, interact, and access information. In the context of education, technological advances act as a catalyst for the transformation of learning from conventional models to more adaptive, collaborative, and participatory digital learning (Adriyanto & Suryani, 2022). Research (Achmad & Utami, 2023) confirms that the shift from conventional education to digital technology-based learning requires digital literacy skills so that the learning process can be effective and oriented towards future needs. Research results (Salim & Lubis, 2025) show that digital technology integration has a significant effect on learning motivation of 30.9%, while digital literacy has a higher influence, namely 63.8%. This indicates that digital literacy has a very strong mediating role in the success of digital learning.

Similarly, (Komala Dewi et al., 2024) emphasizes that digital literacy is a crucial aspect in the world of education because all learning activities are now integrated with digital technology. In the context of online learning, (Arsyad et al., 2023) found that digital literacy and learning motivation together make a strong contribution to learning outcomes with an influence reaching more than 85%. Similar results were also reported by (Rindrayani et al., 2025) that digital literacy, gadget use, and the availability of technological media in schools have a positive effect on learning motivation of 83.2%. Theoretically, these findings reinforce the views of Deci and Ryan (2020) in the Self-Determination theory, which explains that learning motivation will grow when students feel they have autonomy, competence, and social connectedness through a supportive digital learning environment. Thus, digital literacy is not only a technical skill, but also a psychological foundation that strengthens the relationship between technology utilization and increased student learning motivation in the digital era. Learning motivation is a crucial aspect determining the success of technology integration in learning. According to Deci and Ryan (2020), high learning motivation emerges when individuals feel in control of their learning process, feel competent, and have positive social relationships with their environment (self-determination theory). In the context of digital learning, motivation can grow through the use of interactive media, gamification, and project-based learning approaches that directly engage students (Pratama et al., 2019). Appropriately used technology can strengthen students' intrinsic

motivation by providing space for creativity, exploration, and meaningful learning (Wicaksono & Arifendi, 2023). However, various studies show that using technology without adequate digital literacy support can negatively impact learning motivation. Students unfamiliar with technology tend to experience difficulty understanding material, decreased focus, and even academic stress (Prasetya et al., 2021). Therefore, digital literacy serves as an important mediating factor in the relationship between technology use and student learning motivation. Fatmawati (2020) emphasized that strong digital skills enable students to utilize technology effectively to achieve learning goals and develop 21st-century competencies.

In line with this, Mulyono and Setiawan (2023) concluded in their systematic review that the integration of technology and digital literacy plays a significant role in increasing student engagement and motivation at various levels of education. Recent research highlights that the success of digital learning is determined not only by the availability of technology, but also by the readiness of teachers and students to manage and interpret the use of that technology productively and reflectively. Based on these phenomena and empirical findings, this study aims to systematically analyze research trends and directions examining the relationship between technology, digital literacy, and student learning motivation during the 2021–2025 period. Using a Systematic Literature Review (SLR) approach guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020, this study is expected to provide a comprehensive understanding of how the integration of digital literacy and learning technology contributes to increased learning motivation and serves as a foundation for developing more effective learning strategies in the digital age.

The research problem formulation focuses on three main issues. First, the role of educational technology in increasing student learning motivation, as demonstrated by various studies during the 2021–2025 period. Second, the extent to which student digital literacy influences increased learning motivation in technology-based learning contexts. Third, the integration of technology application and digital literacy reinforcement can create a more interactive, adaptive learning environment that sustainably fosters student learning motivation. Thus, this article presents a systematic review of selected research journals to provide a comprehensive overview of the development of literacy, technology, and learning motivation studies in education during the period 2021–2025. The results of this review are expected to serve as an important reference for researchers, practitioners, and educational policymakers in formulating more effective, relevant, and appropriate learning strategies to meet the needs of learners in the digital era.

METHOD

This research employed the Systematic Literature Review (SLR) method, adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. This approach was chosen because it provides a systematic, transparent, and structured framework for searching, selecting, and analyzing scientific literature relevant to the research theme, namely the role of technology and digital literacy in enhancing student learning motivation in the 2021–2025 period. The SLR method allows researchers to gain a comprehensive understanding of trends, directions, and research gaps emerging from various published empirical and conceptual studies. The literature review process followed four main stages in accordance with the PRISMA process: identification, screening, eligibility, and inclusion. During the identification stage, researchers searched for articles through various reputable academic databases such as Scopus, ScienceDirect, SpringerLink, Taylor & Francis Online, and Google Scholar using a combination of the keywords "digital literacy," "educational technology," "learning motivation," and "systematic review." The initial search yielded 1,195 articles. Next, a screening stage was conducted by reviewing titles, abstracts, and keywords to eliminate irrelevant articles, articles not in English or Indonesian, and those outside the 2021–2025 publication period. This resulted in 235 articles meeting the initial criteria.

During the eligibility stage, researchers conducted a full-text review of each article to ensure it met the inclusion criteria, namely research focused on the integration of technology and/or digital literacy in educational contexts and highlighting its impact on student learning motivation. After this rigorous selection process, 53 articles were deemed suitable for further analysis. All selected articles were then analyzed using a thematic and descriptive approach to identify patterns of conceptual relationships between the main variables: learning technology, digital literacy, and learning motivation. The analysis was conducted systematically by grouping research results based on their objectives, methods, key findings, and theoretical and practical implications for the context of digital education. The results of this thematic synthesis are expected to provide an in-depth scientific mapping of the contribution of digital literacy and technology utilization to improving student learning motivation, while also serving as a basis for developing effective and sustainable learning strategies in the era of digital transformation.

RESULTS AND DISCUSSION

Result

Based on the *Systematic Literature Review* (SLR) process with reference to the PRISMA 2020 guidelines, this study identified as many as 1,195 articles obtained from various scientific databases and research registers. After the process of identifying and removing duplicate articles, there are 1,007 articles that then enter *the screening stage* based on titles and abstracts. At the screening stage, articles that are not relevant to the focus of the study, are outside the range of the 2021–2025 publication year, and do not discuss educational technology, digital literacy, or learning motivation are eliminated. This process resulted in 235 articles that were deemed worthy of full review. Furthermore, an eligibility assessment was carried out through a complete text review to ensure the suitability of the context, methodology, and contribution of the research to the study theme. The results of the final selection showed that 53 articles met the inclusion criteria and were further analyzed. The flow of the article selection is presented in Figure 1 in the PRISMA Diagram.

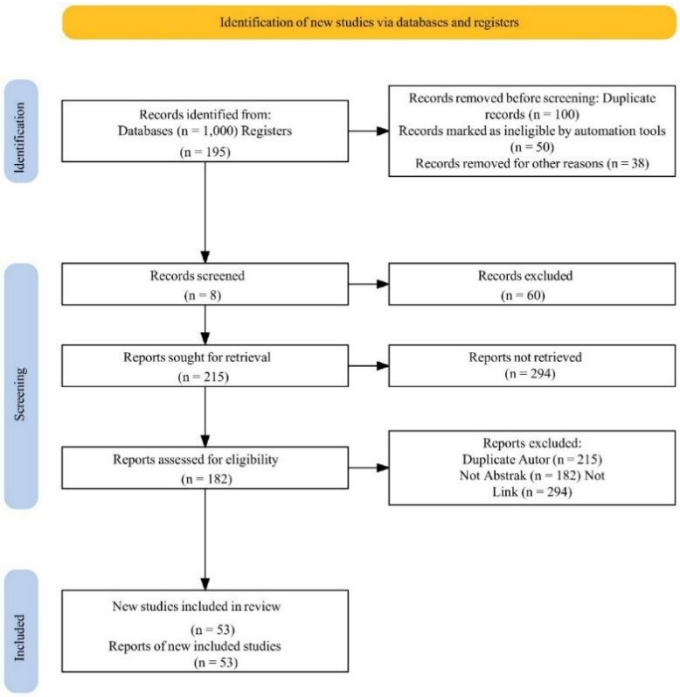

Figure 1. PRISMA Diagram of Research Selection Flow

The results of the synthesis of 53 selected articles show that these studies consistently report a positive relationship between the integration of learning technology, digital literacy, and learners' motivation. The forms of technology used include *Learning Management System* (LMS), e-learning, interactive digital media, gamification, learning videos, *mobile learning*, and project-based learning and differentiation.

Table 1. Journal Review Results

Yes	Reference	Findings
1	Adriyanto, D., & Suryani, N. (2022).	Digital literacy has a significant effect on learning motivation; Students with high literacy are more active and confident.
2	Rahmawati, F., & Hasanah, S. (2024).	Teachers' digital competence is positively correlated with student motivation and participation.
3	Kurniawan, H., & Wicaksono, R. (2022).	The use of interactive digital media increases students' intrinsic motivation.
4	Pratama, R., & Dewi, T. (2021).	Differentiated learning models increase students' interest in learning and confidence.

5	Astuti, S., & Prasetyo, A. (2021).	Teachers with high digital literacy are more effective at motivating students during online learning.
6	Mulyono, H., & Setiawan, A. (2023)	The digital learning environment affects student engagement and motivation to learn.
7	Aini, R. N., & Nurhadi, D. (2023).	Technology integration encourages the motivation and creativity of elementary school students.
8	Fatmawati, L. (2020).	The book emphasizes digital literacy as the basis for independent learning motivation.
9	Suryadi, A., & Handayani, T. (2021).	Digital literacy increases active participation and student learning outcomes.
10	Alim, M., Sarwi, & Subali, B. (2020)	The integration of local cultural contexts and digital technologies increases learning motivation.
11	Santoso, Y. (2023).	The book emphasizes the importance of adaptive digital learning design to learning styles.
12	UNESCO. (2023	Technology increases access and motivation to learn, but it needs digital literacy support.
13	Deci, E. L., & Ryan, R. M. (2020).	Basic theories of intrinsic motivation that are relevant in digital learning.
14	Gilster, P. (2021).	The definition of modern digital literacy that is a reference in 21st century education.
15	Sari, D., & Fitriana, M. (2024).	High digital literacy enhances collaboration and intrinsic motivation.
16	Anugrah, R., & Fauziah, N. (2023).	Educational games increase student enthusiasm and participation significantly.
17	Hamzah, I., & Nur, A. (2022)	Kahoot increases the focus and enthusiasm for learning of elementary school students.
18	Rini, L., & Utami, D. (2023).	Digital literacy strengthens critical thinking skills and learning motivation.
19	Wulandari, F., & Hidayat, S. (2024).	LMS improves the effectiveness of self-paced learning and intrinsic motivation of students.
20	Hidayah, N., & Gunarhadi, G. (2024).	Differentiated learning strengthens students' scientific exploration and collaboration.
21	Azzahra, S., & Rachmawati, D. (2022).	Interactive e-learning improves learning outcomes and student satisfaction.
22	Wijayanti, T., & Rohman, H. (2023).	The use of digital tools strengthens students' motivation and activeness.
23	Hanifah, U., & Rohimah, S. (2021).	Digital literacy affects students' learning responsibilities and motivation.

24	Sulastri, M., & Andayani, N. (2020).	Online learning increases flexibility but demands high digital literacy.
25	Nugraha, F., & Hapsari, R. (2023).	Teachers with high digital skills create motivating learning.
26	Yulianti, D., & Arifin, Z. (2024).	Adaptive models increase students' interest in learning and autonomy.
27	Hasan, M., & Syamsudin, M. (2022).	Digital platforms enhance student interaction and learning responsibility.
28	Marlina, R., & Setiono, D. (2021).	Blended learning improves intrinsic motivation and learning outcomes.
29	Suhendar, E., & Fauzi, F. (2023).	Students with good digital literacy have higher motivation and achievement.
30	Kartika, N., & Lestari, H. (2022).	Gamification increases student enthusiasm and participation in learning.
31	Oktaviani, R., & Nugroho, A. (2023)	The use of visual-audio interactive media increases retention and motivation.
32	Ramadhani, T., & Putra, W. (2024).	Digital literacy is significantly related to student learning outcomes and motivation.
33	Saputri, R., & Khasanah, I. (2023).	Digital literacy strengthens students' communication and active participation.
34	Rahman, S., & Dewi, L. (2021).	Interactive videos increase student engagement and curiosity.
35	Firdaus, A., & Hasan, S. (2023).	High digital literacy teachers produce students with high learning motivation.
36	Yuniarti, A., & Widiastuti, R. (2022).	Digital literacy is the main prerequisite for motivation and success in learning.
37	Zulfikar, D., & Putri, E. (2023).	ICT-based learning increases collaboration and enthusiasm for learning.
38	Arifin, M., & Nuraini, I. (2024).	Digital-based PjBL increases students' literacy and motivation.
39	Wahyuni, E., & Fadhilah, T. (2021).	Mobile learning applications increase independence and interest in learning.
40	Gunawan, D., & Laila, N. (2023).	Digital literacy and intrinsic motivation have a positive effect on each other.
41	Hidayat, P., & Subekti, D. (2020)	ICT integration increases learning engagement and effectiveness.
42	Lestari, P., & Ramli, R. (2024).	Digital literacy strengthens responsibility, discipline, and motivation to learn.

43	Supriadi, E., & Huda, F. (2023).	Technology supports independent learning and long-term motivation.
44	Utami, D., & Siregar, S. (2022).	High digital literacy increases students' creativity in online learning.
45	Wibowo, R., & Hasan, A. (2023).	The use of digital tools increases students' positive perception of learning.
46	Rahardjo, A., & Putra, D. (2024).	Digital literacy plays an important role in supporting differentiated learning.
47	Karim, H., & Syahrani, R. (2022).	High digital literacy has a positive effect on readiness and interest in learning.
48	Chandra, I., & Febriani, L. (2021).	Student engagement increases with the use of interactive digital media.
49	Anggraini, R., & Yusuf, A. (2020).	Literate digital teachers increase students' enthusiasm for learning.
50	Basri, A., & Rahman, I. (2024).	Digital technology increases the understanding and enthusiasm for learning science.
51	Nurfadhilah, I., & Wahyudi, F. (2023).	AR media increases students' interest in learning and concept retention.
52	Hapsari, E., & Aditama, B. (2025).	High digital literacy encourages the motivation and independence of elementary school students.
53	Mary (2025). *JP2SD*	Systematic review 2021–2025; Digital literacy is an important mediating factor between technology and learning motivation.

A summary of the main findings of the entire article is presented in Table 1, which describes the research focus, education level, learning model, and impact of technology and digital literacy on students' learning motivation. In general, the results of the study show that the use of technology has a positive impact on increasing student involvement, interest, and learning independence, especially when supported by adequate digital literacy skills.
In addition, the results of bibliometric analysis using the VOSviewer application show that the most frequently appearing keywords in publications for the 2021–2025 period are *digital literacy*, *learning motivation*, *technology integration*, *student engagement*, and *teacher*. The visualization of the research keyword network is shown in Figure 2, while the interconnectedness of the role of teachers in technology integration is presented in Figure 3. Furthermore, a map of research density that illustrates the focus and intensity of the study is shown in Figure 4.

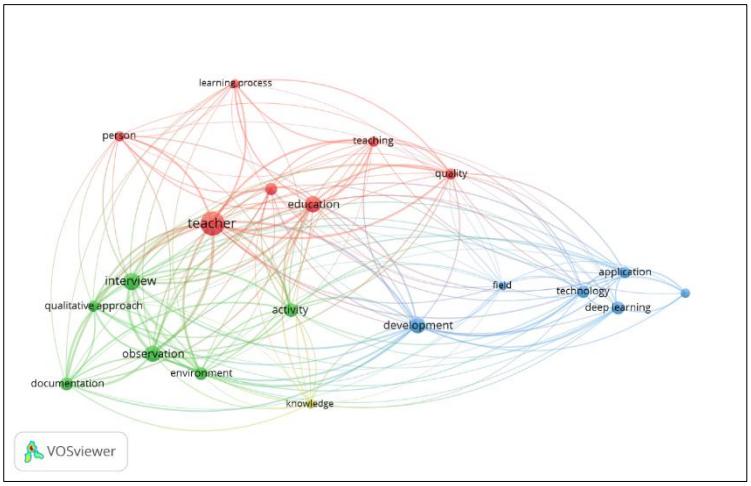

Figure 2. Visualization of Keywords Research Technology, Digital Literacy with VOSviewer

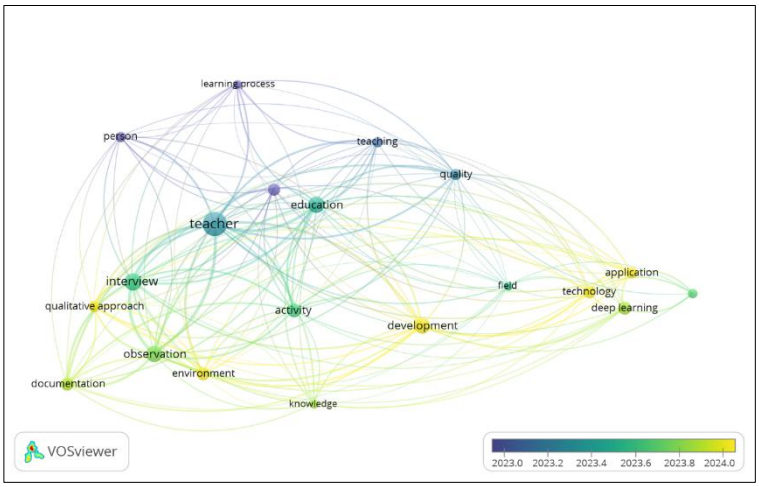

Figure 3. Visualization with VOSviewer

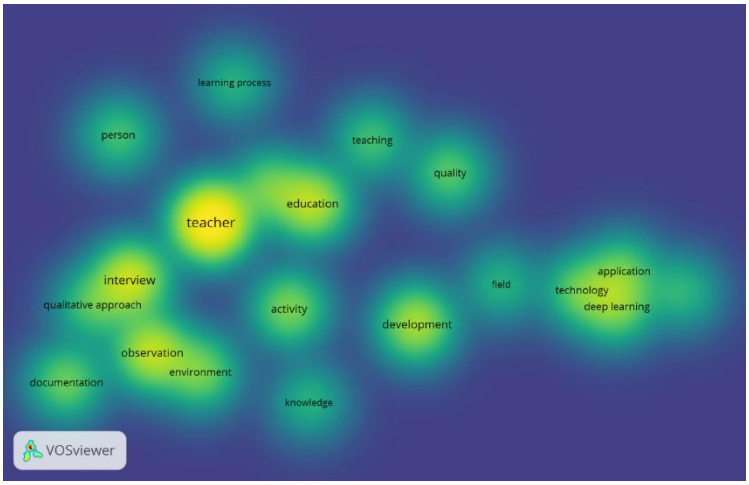

Figure 4. Visualization of Density Maps with VOSviewer

Discussion

The results of this systematic study show that the integration of learning technology contributes significantly to increasing students' learning motivation. The use of digital technology allows learning to take place more interactively, flexibly, and student-centered. Digital media and online learning platforms provide opportunities for students to be actively engaged, get hands-on feedback, and manage the learning process according to their needs and interests. These findings are in line with *the Self-Determination Theory* put forward by Deci and Ryan (2020), which states that learning motivation will increase if basic psychological needs in the form of autonomy, competence, and social connectedness are met. In the context of digital learning, technology provides space for students to have control over the learning process (autonomy), demonstrate abilities through digital-based task completion (competencies), and interact and collaborate with teachers and peers (social connection).

Furthermore, the results of this study confirm that digital literacy plays a major mediating factor in the relationship between the use of technology and increased learning motivation. Students who have good digital literacy are able to use technology critically, select information effectively, and utilize digital learning resources to support the achievement of their learning goals. Conversely, the use of technology without adequate digital literacy support tends to cause learning difficulties, distractions, and decreased motivation. The role of teachers is also an important factor in the success of technology-based learning. Bibliometric findings show that teachers have a strong link with technology integration and learning motivation. Teachers with good digital literacy competencies are able to design adaptive, contextual, and differentiated learning according to the characteristics of students. This is in line

with *Bandura's (1997) theory of self-efficacy which states that an individual's belief in his or her abilities affects motivation and learning success.*

Although most of the research showed positive results, this study also identified several challenges in the implementation of digital learning, including gaps in technology access between regions, limited infrastructure, and variations in teachers' digital competencies. From a methodological perspective, most of the research still uses a descriptive and short-term approach, so it has not been able to describe the long-term impact of technology integration on students' learning motivation. Therefore, further research with experimental and longitudinal designs needs to be developed to gain a more comprehensive understanding. Overall, this discussion emphasizes that the success of digital learning is not only determined by the existence of technology, but is greatly influenced by the level of digital literacy of students and teacher competence. Technological integration supported by strong digital literacy is able to create a positive cycle between student engagement, motivation, and learning success in the digital era.

CONCLUSION

Based on the results of a systematic review of 53 research articles analyzed using the Systematic Literature Review (SLR) approach with PRISMA 2020 guidelines, it can be concluded that technology and digital literacy have complementary roles in increasing student learning motivation in the digital era. The integration of learning technology supported by good digital literacy skills has been proven to create an interactive, collaborative, and student-focused learning environment. Educational technology functions not only as a teaching aid but also as a medium that encourages active student engagement, strengthens intrinsic motivation, and provides learning experiences relevant to 21st-century needs. Meanwhile, digital literacy plays a crucial mediating factor that determines the extent to which technology can be optimally utilized. Students educated with digital literacy skills tend to be more independent, reflective, and creative in the learning process. However, the research results also show that there are still challenges that need to be addressed, including reduced digital access between regions, limited technological infrastructure, and variations in teacher competency in integrating technology into learning. Therefore, a comprehensive strategy is needed to strengthen digital literacy through teacher training, improving school infrastructure, and developing educational policies that support equitable digital access. Theoretically, the results of this study confirm Deci and Ryan's (2020) view of self-determination theory, which states that intrinsic motivation grows when students have autonomy, competence, and social connectedness in learning. Technology and digital literacy provide a space to fulfill these three aspects through adaptive, collaborative, and contextual learning. Thus, well-planned digital learning can be an effective means of fostering learning motivation, increasing independence, and developing the profile of critical, creative, and character-based Pancasila students in the era of digital educational transformation.

REFERENCES

Achmad, W. K. S., & Utami, U. (2023). Sense-making of Digital Literacy for Future Education Era: A Literature Review. *Prima Edukasia Journal*, *11*(1), 47–53. https://doi.org/10.21831/jpe.v11i1.52911

Adriyanto, D., & Suryani, N. (2022). The influence of digital literacy on students' learning motivation during online learning. Journal of Education and Learning Technology, 12(3), 145–155. https://doi.org/10.23887/jptp.v12i3.45678

Aini, R. N., & Nurhadi, D. (2023). The integration of learning technology in increasing the learning motivation of students in the 21st century. Indonesian Journal of Educational Technology, 9(1), 22–34. https://doi.org/10.21009/jtpi.091.03

Alim, M., Sarwi, & Subali, B. (2020). Ethnoscience-based learning in improving the science literacy of elementary school students. Journal of Science Education Innovation, 11(2), 45–54. https://doi.org/10.15294/jips.v11i2.28876

Astuti, S., & Prasetyo, A. (2021). Digital literacy of elementary school teachers in facing the challenges of online learning. Journal of Basic Education Innovation, 6(2), 101–111. https://doi.org/10.24235/jipd.v6i2.1234

Arsyad, A., Syariati, F., & Sukarno, S. (2023). Digital Literacy and Learning Motivation: Impacts on Online Learning Outcomes in Fiqh Study. *Tadris: Journal of Teacher Training and Tarbiyah Science*, *8*(1), 167–180. https://doi.org/10.24042/tadris.v8i1.14523

Bandura, A. (1997). Self-efficacy: The exercise of control. New York: W.H. Freeman and Company.

Bybee, R. W. (2013). The case for STEM education: Challenges and opportunities. Arlington, VA: NSTA Press.

Deci, E. L., & Ryan, R. M. (2020). Self-determination theory: Basic psychological needs in motivation, development, and wellness (2nd ed.). New York: Guilford Press.

Ifdaniyah, R., & Sukmawati, D. (2024). Implementation of the RADEC model to improve the metacognitive abilities of elementary school students. Journal of Basic Education and Learning, 14(1), 11–20. https://doi.org/10.31004/jpdp.v14i1.3211

Fatmawati, L. (2020). Digital Literacy in the World of Education. Jakarta: Prenadamedia Group.

Fatmawati, E., & Safitri, E. (2020). *Information and Technology Literacy Skills of Prospective Teacher Students Facing Learning in the Era of the Industrial Revolution 4.0*. 214–224. https://doi.org/10.31571/edukasi.v18i2.1863

Kurniawan, H., & Wicaksono, R. (2022). The relationship between the use of digital media and the learning motivation of elementary school students. Journal of Basic Education of the Archipelago, 7(2), 75–86. https://doi.org/10.26737/jpdn.v7i2.5678

Komala Dewi, R., Lasmana, O., & Diliarosta, S. (2024). How to cite: Nadhila, A et al (2024). The Influence of Overconfidence and Risk Perception on Investment Decisions: The Moderating Effect of Financial Literacy on Individual Millennial Implications and Impact of Digital Literacy on Higher Education: Systematic Literature Review. *Generation Investors. Journal of Eduvest*, *4*(6), 5300–5312. http://eduvest.greenvest.co.id

Mulyono, H., & Setiawan, A. (2023). Digital learning environment and student motivation: A systematic review. Indonesian Journal of Educational Research and Review, 8(1), 15–28. https://doi.org/10.23887/ijerr.v8i1.98765

Prasetya, A. E., Limiansih, K., & Krissandi, A. D. S. (2021). Analysis of the Needs of the Development of the Independent Learning Curriculum of PGSD for Papuan Students. *Snfkip*, 218–227.

Pratama, R., & Dewi, T. (2021). The application of differentiation-based learning in increasing student learning motivation in the digital era. Journal of Basic Education and Learning, 11(2), 112–123. https://doi.org/10.31004/jpdp.v11i2.2544

Rahmawati, F., & Hasanah, S. (2024). Analysis of the role of teachers in developing digital literacy of elementary school students. Journal of Basic Education Studies, 9(1), 1–13. https://doi.org/10.31004/jkpd.v9i1.1789

Rindrayani, S. R., Lely Widyawati, L., & Dirgantoro, A. (2025). The Effect of Digital Literacy, Gadget Use, And Availability of Technological Media in School on Junior High School Students' Learning Motivation. *IJE: Interdisciplinary Journal of Education*, *3*(1), 1–11. https://doi.org/10.61277/ije.v3i1.189

Salim, & Lubis, Muhammad A. Fadhillah. (2025). *Motivation Towards the Era of Golden Indonesia 2045*. *Sec. 5*.

Suryadi, A., & Handayani, T. (2021). The impact of digital literacy on student engagement and learning outcomes. Journal of Education and E-Learning Research, 8(2), 143–151. https://doi.org/10.20448/journal.509.2021.82.143.151

SukExample BIssa JTabarearno, N. M., Wirawan, P. W., Adhy, S., Andi, S., Mukhlasin, H., Muhaemin, M., Nurhayati, S., For, D., Salah, M., Conditions, S., Degree, M., Engineering, S., Study, P., Electro, T., גרינבלט, ', Martinench, A., Network, N., Php, W., Algorithm, M., ... Adhitya Putra, D. K. T. (2019). No 主観的健康感を中心とした在宅高齢者における 健康関連指標に関する共分散構造分析Title. *Rabit : Journal of Technology and Information Systems Univrab*, *1*(1), 2019.

Wicaksono, A. A., & Arifendi, R. F. (2023). *APPLICATION OF DIGITAL LITERACY IN COLLEGE SUBJECTS*. *6*(2), 113–120.