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Systematic Literature Review: The Use of Educational Technology for Student Learning Engagement

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ABSTRACT

This study aims to systematically review various studies that discuss how technology is used to encourage student learning engagement. A systematic literature study approach was used to analyze seven international journal articles published between 2020 and 2025. The results of the study show that technology is used in various forms such as LMS, interactive quiz platforms, digital feedback systems, to AI-based adaptive learning, which have been proven to be effective in increasing active participation, motivation, and collaborative engagement of students. In addition, technology has an impact both directly through real-time interactions and indirectly through increased motivation and positive perceptions of learning. However, the effectiveness of technology is greatly influenced by teacher readiness, learning design, and supporting infrastructure. These findings emphasize the importance of strategic and contextual technology integration in order to truly support improving the quality of student learning engagement at various levels of education

Keywords: Educational technology, Student learning engagement, Digital learning and Systematic literature study

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INTRODUCTION

In the ever-growing digital era, the use of technology has become an inseparable part of various aspects of life, including in the field of education. The development of digital technology encourages educators to integrate technology wisely, appropriately, and optimally into the learning process. Today, technology has become an integral part of creating a more dynamic and interactive learning environment. With the increasing use of the internet, the use of smart devices such as computers, tablets, and smartphones has become the primary means for students to engage in learning activities (Jang et al., in An et al., 2022). In addition, the preparation of increasingly adaptive e-learning content also enriches the digital learning experience (El-Sabagh, 2021). Educational technology not only serves as a tool, but also as a medium to create a learning experience that is fun, meaningful, and in accordance with the needs of students.

One of the main benefits is to encourage student involvement from behavioral, cognitive, and emotional aspects. This engagement is an important indicator of the quality of education, as it shows the extent to which students are actively involved in the learning process (cited in El-Sabagh, 2021). In the context of digital learning, synchronous interaction through online platforms is able to increase motivation, social skills, and reduce students' anxiety (cited in Alam et al., 2025). This shows that technology has great potential in creating a conducive learning environment. The use of information and communication technology (ICT) in education allows students to learn independently, develop critical thinking skills, and support teachers in strengthening face-to-face learning (Sivananda & Abdul Aziz, 2021).

Learning engagement itself is a multidimensional construct that reflects students' engagement intellectually, emotionally, and socially. Students involved will show effort, attention, and interest in understanding the learning material and interacting positively in class (El-Sabagh, 2021). Further, these

engagements are grouped into three main dimensions: behavioral, cognitive, and emotional. Behavioral engagement includes active participation in class activities and assignment completion, cognitive engagement reflects deep and exploratory thinking processes, while emotional engagement relates to positive feelings towards learning activities. These three aspects complement each other and contribute to a well-rounded learning experience (Zou, 2022).

This research specifically focuses on the study of various forms of educational technology that have been used to increase student involvement in the learning process. The object of study includes digital devices, platforms, and applications used at various levels of formal education. Recent literature shows that a number of technologies, such as game-based learning apps (e.g. Kahoot!), adaptive learning systems, and interactive platforms, have a significant influence on increasing student participation and learning motivation (Ramaila, 2024; Sivananda & Abdul Aziz, 2021; Teng & Wang, 2021). In addition, research (An, Yu, & Xi, 2022) shows that the use of interactive technology is able to increase students' active participation through increased confidence and learning control. Studies from (Nature, Stoica, & Özgöbek, 2025) also emphasize the importance of synchronous platforms in building social connections that support students' emotional engagement, especially in online learning. This is reinforced by (Sivananda & Abdul Aziz, 2021) which shows that technology not only improves learning efficiency, but also strengthens students' connections with content and teachers through interactive media.

Based on these publications, it can be concluded that there is a positive trend between the use of technology and student engagement. The use of information technology in education has been proven to support more intense active and collaborative learning (Teng, 2021). However, these studies have not fully explored the dimensions of involvement and the form of technology used, so research is still needed that presents a more complete picture. Therefore, this study aims to conduct a systematic literature study related to the use of educational technology in increasing student learning engagement. This study presents a synthesis of the various technological approaches used, the context of their application, and the form of engagement intended. Based on this background, this study aims to answer two main questions, as follows: 1. How is educational technology used to increase student learning engagement in various contexts and forms of engagement? 2. Does the use of educational technology have a direct or indirect impact on student engagement in the learning process?

METHOD

This study uses a systematic literature review approach as the main method to review, analyze, and synthesize the results of previous research that are relevant to the use of educational technology in increasing student learning engagement. The study process began with the collection of data in the form of journal articles obtained from various trusted databases such as DOAJ, Springer Open, Sage Journals, ResearchGate, Springer Nature, and Taylor & Francis. The article criteria used are articles published in the last 5 years, namely from 2020 to 2025. The keywords used in the search process are "educational technology", "student learning engagement", and "digital learning". From the search results, a number of articles were obtained which were then selected based on their relevance to the focus of the study. After the screening process, seven main articles were obtained to be analyzed in depth, especially in the research results and conclusions section. To support the analysis process, a comparison table was prepared that contained important information from each article, such as the author's name, year of publication, article title, type of technology used, form of student involvement discussed, and main results. This data grouping makes it easier for researchers to analyze and understand in more detail the contribution of each article that has been studied.

FINDINGS AND DISCUSSION

Based on the results of the literature review and screening (data selection) that has been carried out by the author, as many as seven articles were obtained as many as the results of the analysis that were in accordance with the research topic. The results of the article study can be seen in Table 1.

Table 1. Literature Search Analysis

Researchers	**Article Title**	**Research Objectives**	**Key Results**
An, Yu, & Xi (2022)	*Relationship between perceived teacher support and learning engagement among adolescents: Mediation role of technology acceptance and learning motivation*	Explain the role of support teachers, technology acceptance and learning motivation to student engagement.	Improved teacher support acceptance of technology and motivation that strengthens engagement. Students are more engaged when they feel the teacher is supportive and learning technology is easy to use and useful.
Nature, Stoica & Özgöbek (2025)	*Asking the classroom with technology: a Systematic Literature Review*	Evaluating effectiveness *Response Technology* (RT) in increasing student engagement in the classroom as well as providing implementation guidance for the future.	The majority of studies show RT increase active participation, interaction, and student learning outcomes. However, challenges such as gaps digital literacy, low digital literacy, and lack of infrastructure is still an obstacle.

Stuttgart (2024)	*Harnessing Wow! as an educational Tool to foster meaningful teaching and learning: A systematic review*	Studying various studies regarding the use of Kahoot! in learning to understand its impact on the learning process- teach student engagement, as well as the challenges of its implementation .	Most studies shows that Kahoot! effectively increase active participation, motivation, and collaboration. However, it is still necessary More Training continue for teachers so that their utilization is optimal. This study confirms that Kahoot! can be Innovative, flexible, and style-supportive learning tools learning is diverse.
Saleem & Aslam (2025)	*A Multi-Faceted Deep Learning Approach for Student Engagement Insights and Adaptive Content Recommendations*	Develop and evaluate deep learning-based student engagement classification models to assess and respond to engagement in real-time through adaptive recommendati ons.	The AI system successfully classifies n student engagement with 94% accuracy and presenting Recommendations appropriate content. Findings show the effectiveness of AI in detecting and improve personal student involvement. However, there are challenges such as privacy and scalability.
Sivananda & Abdul Aziz (2021)	*Utilizing Technology to Promote Active Learning: A Systematic Literature Review*	Systematically review various studies related to the use of technology for encourage active learning in ESL students.	Google classroom is considered the most effective in increasing student engagement and understanding. However, other technologies such as social media need to be used wisely.

Teng & Wang (2021)	*The effect of two Educational technology tools on student engagement in Chinese EFL courses*	Examine the influence of two educational technology tools on the three dimensions of student engagement in EFL learning.	The results showed that emotional engagement had the strongest influence on the use of educational technology. LMS is more effective than social networks in increasing student engagement.
Zou, Xie & Wang (2022)	*Effects of technology enhanced peer, teacher and self-feedback on students' collaborative writing, critical thinking tendency and engagement in learning*	Investigate the influence of technology-supported peer, teacher, and self-feedback on collaborative writing skills, critical thinking tendencies, and students' levels of engagement in learning	The results show that feedback from peers and technology-powered teachers is more effective in improving the quality of students' collaborative writing. The use of Google Docs and Flipgrid is considered practical and engaging, and encourages active student participation.

Based on the results of the analysis of seven journal articles that have been reviewed, it was found that the use of educational technology has a considerable role in increasing student learning engagement, both in the learning process in the classroom and in the online context. Student engagement that includes cognitive, emotional, and behavioral dimensions is a key factor in determining learning effectiveness. In today's digital era, educators' challenges are not only limited to delivering material, but also ensuring that students are actively and meaningfully involved in the learning process. Online learning, if used correctly and wisely, can be more engaging for students and teachers. This, in turn, can help address the problem of students who are distant and less active during class. On the other hand, modern technology-powered classrooms create an active learning platform and allow students to gain knowledge intensively and independently by exploring the large selection of platforms such as Google Classroom, Kahoot!, and others. This encourages the desire for a student-centered learning environment. Not only that, in a technology-supported classroom, a concept can be presented in various ways that suit the needs and speed of different students (Sivananda & Abdul Aziz, 2021). The types of technology used in these studies are very diverse, ranging from learning management systems (LMS), interactive quiz applications, AI-based technologies, to social media and collaborative platforms. This diversity of technology shows that there is no single approach that is most appropriate, because the use of technology generally adjusts to the learning objectives, character of students, and the teaching context faced. In addition, the effectiveness of the use of technology also depends heavily on the role of teachers, supportive learning designs, and infrastructure readiness. Thus, the next discussion will review various forms of technology use and how it impacts student involvement in learning.

Forms of Use of Educational Technology in Increasing Student Engagement

Various studies analyzed show that educational technology is utilized in various forms to increase student engagement in the learning environment. In the context of online and offline learning, technology plays a role as a facilitator that allows for more dynamic interaction between teachers and students. One of the interesting findings comes from a study (An et al., 2022) that highlighted the role of technology as an intermediary between teacher support and student engagement. In this context,

technology is not just a learning tool, but a means that strengthens the social and emotional connection between teachers and students. When students feel the support of their teachers facilitated through digital media, their motivation to learn increases, and this contributes to greater engagement in the learning process. Although the form of engagement is not explicitly described, the motivational aspects highlighted show a close link to the emotional and cognitive dimensions of student engagement.

Meanwhile, research conducted by (Alam et al., 2025) provides concrete evidence on the effectiveness of the use of response technology such as clickers and polling systems. This technology allows students to actively engage in answering questions in real-time, creating a responsive and participatory classroom atmosphere. The involvement built here is active and participatory, students not only become recipients of information, but also contribute to the learning process directly. Similarly, research (Ramaila, 2024) shows that the use of Kahoot! As a gamification-based platform, it is able to significantly encourage student engagement. By creating a fun, competitive, and interactive learning atmosphere, Kahoot! facilitate student active participation. The unusual use of digital devices for students also helps to lower technological barriers and make learning activities more inclusive and engaging. On the other hand, cognitive involvement is also strengthened because students must think quickly and focus on answering questions appropriately.

The AI-based approach developed by (Saleem & Aslam, 2025) through the Engagement Level Classification Framework (ELCF) system shows a higher level of innovation. The system is able to recognize students' facial expressions and behaviors to assess their engagement in real-time, and adjust the teaching materials based on the results of the classification. This strengthens engagement in all three dimensions simultaneously: students are more focused, feel cared for, and get material that suits their actual circumstances. Furthermore, in the realm of language learning, it shows that technology can be applied in a variety of ways to meet the needs of ESL and EFL students. LMS like Superstar-Xuexitong create structured learning spaces with feedback feature support, which supports behavioral and cognitive engagement. In contrast, social platforms such as WeChat, while popular, have proven to be less effective for deep learning purposes. In this context, the structure and function of technology determine the level of success in encouraging student involvement (Sivananda & Abdul Aziz, 2021; Teng & Wang, 2021). In addition, technology also strengthens the collaborative aspect of learning, as found by (Zou, Xie, & Wang, 2022). The use of digital feedback, both from teachers, peers, and reflectively in collaborative writing activities has been shown to increase overall engagement. Tools like Google Docs and Flipgrid not only facilitate interaction, but they also facilitate emotional engagement as students feel valued and given space to contribute. This largely leads to the involvement of student behavior in learning. In other words, technology plays a role in creating a more responsive learning cycle, which stimulates students' behavioral, emotional, and cognitive engagement simultaneously.

The Direct and Indirect Impact of Technology on Student Engagement

Based on the findings of the seven studies, it shows that the use of technology in education has a diverse impact on student engagement, both directly and indirectly. Technology can be an immediate visible trigger for engagement, such as increased active participation through polling or gamification. However, in some cases, the impact is indirect. For example, when teachers' support for the use of technology creates a positive learning environment and ultimately increases student motivation, as exemplified in a study (An et al., 2022). Other studies reinforce that the immediate impact of technology is evident when students are invited to engage in real-time interactions or get appropriate learning materials in person. However, the effectiveness of this technology remains highly dependent on teacher readiness, instructional design, and institutional support. Without adequate digital competencies, technology has the potential to be a hindrance to solutions (Sivananda & Abdul Aziz, 2021). Meanwhile, a study by (Teng & Wang, 2021) highlights the importance of adaptive learning strategies to maximize the potential of technology in the emotional and cognitive aspects of students. In the context of feedback, a study by (Zou et al., 2022) shows that technology can simultaneously produce a direct impact, through increased interaction and participation, and an indirect impact in the form of strengthening students' critical thinking skills.

While most of the findings show positive results, there are still challenges to anticipate. Some of the main issues include data privacy and security, inequality of access to digital devices, and lack of training for teaching staff. Without strong systemic support, technology risks widening the gap,

especially for students from disadvantaged communities. Technology, by definition, cannot stand alone, it needs a supportive ecosystem, ranging from infrastructure, teacher training, inclusive policies, to relevant pedagogical approaches. As noted in the article (Teng & Wang, 2021) the challenges and opportunities of technology utilization must be faced in a balanced manner. If managed wisely, technology can expand access to learning, improve the efficiency of the teaching and learning process, and create a more meaningful and adaptive learning experience.

The use of technology in education also has limitations that need to be considered. While platforms such as Kahoot, YouTube Edu, Facebook, Twitter, Zoom, and Google have proven to be effective in supporting learning, their use should still be limited, especially for younger students. Without adequate supervision, students can easily access inappropriate content or misleading information on the internet. Therefore, the role of parents, teachers, and educational institutions is very important to ensure that technology is used appropriately to support a safe and healthy learning process (Sivananda & Abdul Aziz, 2021). One of the main challenges facing educators today is the abundance of educational technology tools available, but not all of them are used appropriately. To achieve optimal learning outcomes, educators need to understand the advantages and limitations of each technological tool that they can use with students (Teng & Wang, 2021).

Overall, this literature review confirms that the success of educational technology integration is largely determined by the way it is designed, implemented, and used strategically. Student engagement is not an automatic result of the use of digital tools, but rather the result of teaching practices that are responsive to students' social, emotional, and pedagogical needs. These findings are not only important for teachers as learning implementers, but also for policymakers and educational technology developers who need to see the implementation of technology as part of a complete and sustainable education ecosystem.

CONCLUSION

Based on the results of a study of seven journal articles, it can be concluded that educational technology has an important role in increasing student learning involvement in cognitive, affective, and behavioral aspects. Various forms of technology such as interactive quiz applications, online learning platforms, social media, and AI-based learning systems have been proven to encourage active participation, spur learning motivation, and strengthen cooperation between students. However, the positive impact of technology does not appear automatically, but is highly dependent on how the technology is designed, implemented, and supported by teachers and the readiness of the supporting infrastructure. Proper technology integration can facilitate wider access to information, increase students' emotional engagement, and strengthen interactions between teachers and students. However, a number of challenges such as inequality of digital access, low technological literacy, and limited training for teachers are still obstacles that need to be considered. In addition, in terms of impact, technology can affect student engagement both directly (through real-time content adaptation) and indirectly (through increased motivation and the perception of ease of use).

The practical implication is that teachers need to be given training that is not only technical, but also strategic, namely how to choose and integrate technology with a learning approach that suits the characteristics of students. On the other hand, schools and the government need to ensure the availability of adequate digital infrastructure and equitable access, so that all students can experience the benefits of technology fairly. Student involvement will not be maximized without the readiness of various parties involved in the education ecosystem. That way, technology can really be a tool that strengthens student engagement and at the same time improves the overall quality of learning

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