

## **E-Learning-Based Learning Innovation: Student Engagement in The Digital Era**

**Khusnul Khotimah<sup>1\*</sup>, Ginan Hilmawan<sup>2</sup>, Roidhotun<sup>3</sup>**

<sup>1</sup>Mathematics Education, Universitas KH. A. Wahab Hasbullah

<sup>2</sup>Islamic Education, Universitas KH. A. Wahab Hasbullah

<sup>3</sup>Islamic Education, Universitas KH. A. Wahab Hasbullah

\*Email: [khusnulkhotimah@unwaha.ac.id](mailto:khusnulkhotimah@unwaha.ac.id)

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### **ABSTRACT**

*E-learning-based learning innovation has become one of the main solutions in improving student engagement in the digital era. This article aims to explore the various forms of student engagement in e-learning and their impact on learning outcomes. The literature review method examines relevant studies in the past five years, which show that student engagement can be divided into several categories, including cognitive, emotional, social, and practical engagement. The results show that high engagement in e-learning is positively associated with improved learning outcomes, motivation, and development of students' social skills. In addition, e-learning also promotes learning independence, which is important for future learning. The findings emphasize the importance of designing interactive and engaging e-learning experiences to increase student engagement, thus supporting educational success in the digital era.*

**Keywords:** *Learning Innovation; E-Learning; Student Engagement*

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### **INTRODUCTION**

The development of science and information technology is getting faster and faster. This rapid development phenomenon affects changes in daily habits. The use of e-learning is one example of the utilization of information technology in the field of education. The quality of education is very important, so it needs to be improved. To design and realize an information system for monitoring and evaluating the quality of teaching and learning conducted online. The era of Society 5.0, known as the era of “smart society” or “superintelligent society”, describes dramatic changes in the interaction between humans and technology. In this era, technologies such as artificial intelligence (AI), the Internet of Things (IoT), and big data are no longer just tools, but also an integral part of daily life, work, and education.

Higher education, as one of the main pillars in preparing future generations, cannot ignore the huge impact caused by Society 5.0. With the internet as a connecting medium, it can facilitate the dissemination and storage of information widely and can be easily accessed anytime and anywhere. This unlimited speed can then minimize costs because it is more efficient and cheaper. One of the biggest challenges faced is how to integrate technology and innovation in learning so that students can understand, adapt, and utilize this technology effectively in their learning. Some of the learning models applied in the Society 5.0 era include freeing up when they want to learn. There are various scenarios that can be done so that learners are more active, productive, and creative, as well as able to collaborate in their implementation.

Quality education can produce students who can develop skills that are beneficial to themselves and society. Electronic learning (e-Learning) is very important to implement because it is expected to improve conventional learning patterns into digital learning patterns or also known as the concept of learning conducted through electronic media networks. Technology in the field of artificial intelligence enables every element to support and enhance knowledge. In terms of perspective, artificial intelligence is a representation of knowledge that is used in determining the knowledge management process, then obtaining information and drawing conclusions from knowledge, which is then interpreted by the machine (Cahyaningrum dkk, 2023).

The development of information and communication technology has brought significant changes in the world of education, especially in learning methods. E-learning, as a form of learning innovation, has become the main choice in this digital era. E-learning-based learning not only offers flexibility in time and place, but also provides opportunities for students to be actively involved in the teaching and learning process. Student engagement is an important element that can affect the effectiveness of their learning and academic outcomes (Sari, 2020).

In today's digital era, innovation in learning is crucial to increase student engagement. E-learning-based learning has emerged as one of the effective solutions to address the challenges of modern education. By utilizing information and communication technology, e-learning offers greater flexibility and accessibility for students, allowing them to learn anytime and anywhere. This is particularly relevant given the changes in students' learning behavior that increasingly rely on digital devices.

Student engagement in the learning process is a key factor affecting learning outcomes. Research shows that students who are actively involved in learning tend to have higher motivation and better academic results (Sari, 2020). Therefore, it is important to develop learning strategies that can increase student engagement, especially in the context of e-learning.

In Indonesia, various studies have been conducted to explore the effectiveness of e-learning in improving student engagement. For example, research by Prasetyo and Sari (2021) showed that the use of interactive e-learning platforms can increase student participation in learning activities. In addition, research by Rahmawati (2022) emphasizes the importance of interesting and relevant content design to increase student motivation in online learning.

Against this background, this journal aims to explore e-learning-based learning innovations and their impact on student engagement in the digital era. Through the analysis of various case studies and current literature, it is expected to find effective strategies to improve student engagement in online learning.

## **METHOD**

The research uses a literature review method that focuses on the stages or research processes of identification, study or analysis, evaluation, and interpreting and making conclusions based on the results of research related/in accordance with the focus of the research contained in journals in a systematic and structured manner that follows predetermined stages so that it becomes a solution to the problem set. The criteria for the journal data used include journals published in the 2020-2025 time span. The data used are journals related to e-learning-based learning innovations: student engagement in the digital era.

## **RESULT AND DISCUSSION**

### **Results**

The results in this study are the results of data analysis and a summary of articles that have been obtained from journals, with a total of 20 articles selected. Based on the search, articles related to e-learning-based learning innovation: student engagement in the digital era were obtained. The learning innovations applied to e-learning-based are presented in Table 1.

**Table 1.** Forms of e-learning-based learning innovation

Researcher and Year	Learning Innovation
Fatimah et al., (2021)	Curriculum innovation strategies include facilitative strategies, educative strategies, persuasive strategies, and coercive strategies.
Isnaini et al. (2021)	Development of learning media using Canva design.
Sari (2020)	The implementation of gamification in learning can increase motivation and engagement.
Khuzaini et al. (2022)	Learning videos using Sparkol Video Scribe software.
Suhroson and Uluwiyah (2020)	Development of e-book-based learning.
Angelina (2022)	Implementation of multi-representation-based learning.
Megasari (2021)	Learning methods based on visual and enjoyable approaches, oriented toward creativity, and applying a blended learning system. This is done using a virtual whiteboard medium, Google Jamboard.
Cahya Ningrum and Cuhana Ziransyah M.R (2023)	Development of e-learning-based learning media innovation using Moodle in computer architecture and organization courses.

Imam Cahyanto (2023)	Utilization of e-learning platforms based on cloud computing to enhance the effectiveness of distance learning.
Rohman Hadi Mustofa and Henni Riyanti (2020)	The development of e-learning as a learning innovation in the digital era.
Anisa Permata Sari and Munir (2024)	The utilization of digital technology in learning innovation to improve the effectiveness of classroom activities.
Purnamaningsih (2021)	The implementation of e-learning as an educational innovation to enhance students' critical thinking skills.
Husnu Saadah (2021)	E-learning learning strategies in the digitalization era.

Based on table 1, information is obtained that e-learning-based learning innovations: student engagement in the digital era in the form of curriculum innovation strategies such as facilitative and educative strategies that aim to increase student interaction and engagement, the use of creative learning media such as canva or video, gamification, visual-based and fun learning methods, increasing critical thinking skills. Furthermore, articles related to the impact/influence of e-learning-based learning innovations: student engagement in the digital era are presented in Table 2.

**Table 2.** Impact of e-learning-Based Learning Innovations

Author	Impact
Almaiah and man (2020)	The use of e-learning platforms in higher education significantly increases student engagement.
Safari et al., (2020)	Formation of creative and active attitudes among training participants.
Anisa Permata Sari and Munir (2024)	Improving the effectiveness of classroom activities.
Purnama Ningsih (2021)	Enhancing students' critical thinking skills.
Fitriani and Rahman (2021)	The impact of e-learning during the COVID-19 pandemic may reduce educational inequality.
Hidayati, N (2021)	E-learning has a positive influence on increasing student engagement.
Murnaka, N (2021)	The use of a learning Management System (LMS) significantly improves student learning outcomes.

Based on Table 2, the information obtained is that e-learning-based learning innovation: student engagement in the digital era has an impact on increasing the effectiveness of classroom activities, increasing students' critical thinking skills, increasing student involvement, forming creative and active attitudes, reducing educational gaps, improving student learning outcomes.

## Discussion

Innovation in education or learning is an effort to create and disseminate new teaching tools and methods, both in the form of organization and technology. The main challenge is how to develop knowledge that can provide enlightenment and improvement for the education system. Learning innovation plays an important role in improving human ability to create positive change in the world. Education is the main means of producing competent human resources. To encourage the progress of innovation, it is necessary to have confidence in renewal, new perspectives, human resources that are open to change, and a supportive environment. Innovation in education is a necessity that cannot be avoided because education and innovation are interrelated and take place continuously. To maximize the potential for existing innovation, the right strategy and cooperation from various parties are needed, including changes caused by innovation. Innovation is closely related to modernization, which includes renewal and progress in various fields. Therefore, in creating new things in the world of education, collaboration and cooperation are needed between various elements, such as teachers, society, and government as stakeholders.

The main challenge of educational innovation is producing knowledge that truly contributes to improving the education system. Achieving success requires a strong belief in change, a supportive environment, and collaboration among teachers, communities, and the government. Teachers' ability to adapt to change, along with cooperation among various parties, plays a crucial role in ensuring that innovation continues to bring renewal to education and learning. The use of learning media greatly enhances the effectiveness of the learning process and the delivery of messages and instructional materials. The media serves as a tool that can increase student engagement during learning activities. Since each type of media has different characteristics, it is important to select and use it carefully and appropriately to ensure it supports the learning objectives effectively.

In the era of globalization and the development of information flows, the use of Information Technology (IT)-based learning media has become an unavoidable need and demand today. However, in practice, the use of this media is not simple. To implement the media, it is necessary to consider various techniques so that the media can be optimized effectively and according to the desired goals. In this modern era, the development of learning media that rely on technology and information is increasingly rapid, so this has become a skill that must be mastered by both educators and students. However, in practice, the utilization of technology and information-based media is not easy to learn and apply. In its application, the use of technological media requires certain techniques so that it can be maximally utilized and its use is effective and in accordance with its objectives.

Several types of media can be used in IT-based learning. These media can be categorized into the following three groups:

- Visual media is a type of media that can be seen using the sense of sight. Teachers often use this media to help deliver subject matter. Visual media can be divided into two types, namely media that cannot be projected (non-projected visuals) and media that can be projected (projected visuals).
- Audio media is media that conveys information in the form of sounds that can only be heard. This type of media is able to stimulate students' thoughts, feelings, attention, and understanding of the subject matter. Examples include sound cassette and radio programs. Audio media is often used in learning that emphasizes listening skills.
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Audio-visual media that combine audio and visual elements are often called seeing-hearing media. The use of audiovisual media makes the delivery of subject matter more comprehensive and effective. In addition, in some situations, this media can take over the role of the teacher, so that the delivery of material can be done through the media, while the teacher functions as a facilitator who assists students in the learning process. Examples of audiovisual media include video or television programs, instructional videos, and sound slides.

Digital technology has become an integral part of education, providing tools and applications that make learning more interactive, flexible, and engaging. The utilization of digital technology in learning not only facilitates access to information but also changes the way teachers and students interact and the way learning materials are delivered. With the help of digital technology, students can learn at their own pace, access learning resources from various places, and collaborate with their peers virtually. One type of digital technology that can be used in learning is e-learning, E-Learning (Electronic Learning), E-learning includes the utilization of the internet and digital platforms to deliver learning materials. This includes online courses, webinars, and virtual classes.

Digital technology-based learning innovation (e-learning) has brought significant changes in the world of education, providing new opportunities for teachers and students to explore more dynamic, flexible, and efficient learning methods. The application of digital technology (e-learning) in learning brings various benefits, ranging from increased access to wider information to more interactive and interesting methods of delivering material. Here are some benefits of e-learning-based learning innovation:

- Increased accessibility, e-learning allows students to access learning materials anytime and anywhere, very helpful in fulfilling their learning needs.
- Better interactivity, by using digital media, allows students can interact with learning materials more actively so as to improve understanding and retention of information.
- Personalization of learning, digital technology enables a more personalized approach to learning,

where students can learn according to their own pace and learning style.

- Increased Student Engagement, the utilization of technological tools and applications can make learning more interesting and enjoyable, thus increasing student motivation.
- Enhanced Collaboration, technological innovations allow students to collaborate with classmates and teachers, both in person and virtually, thus enriching their learning experience.

The implementation of e-learning-based technology in education faces various challenges and obstacles that need to be addressed to maximize its benefits. The application of digital technology-based learning encounters significant challenges and barriers, including:

- Access and Infrastructure: One of the main challenges is the lack of access to adequate technology and infrastructure, especially in rural areas and communities with limited resources. This includes unstable internet access and the lack of necessary hardware for learning.
- Training and teaching skills: Many educators feel that they lack the necessary skills to use technology and receive insufficient training to integrate technology into their teaching. This can lead to a lack of confidence and discomfort in using digital media.
- Cultural and language barriers: Indonesia's cultural and linguistic diversity can create gaps in access to digital education content. Many students may struggle to understand materials presented in a language they are not proficient in, requiring more localized content.
- Student engagement: While technology can enhance access, not all students have the same motivation or engagement in e-learning. Some may feel isolated in an online learning environment and struggle to stay focused and motivated.
- Institutional readiness and policy: Not all educational institutions are prepared to adapt to technology-based learning. Inconsistent policies and a lack of support from higher education institutions can also hinder the effective implementation of e-learning technology (Sari, 2024).

E-learning is a learning method that utilizes information and communication technology, especially the internet, to support the teaching and learning process. According to Sari (2021), e-learning is not limited to online learning but also includes the use of various digital platforms that enable interaction between students and educators. In Indonesia, e-learning has become increasingly relevant, especially during the COVID-19 pandemic, when many educational institutions have switched to online learning systems to maintain the continuity of education (Yulianti, 2023). E-learning provides flexible access to learning materials, facilitates communication between students and teachers, and supports the evaluation process electronically. In addition, e-learning also includes distance learning, which is a learning process that occurs when students and educators are in different locations but can still interact and access materials through digital communication media. Distance learning utilizes technologies such as the internet, teleconferencing, and other online learning resources. In this context, e-learning functions as a means of delivering materials, facilitating virtual discussions, and providing technology-based learning support. Thus, e-learning is not only an alternative learning method, but also an innovative solution to increase the effectiveness and reach of education in the digital era.

Distance learning, on the other hand, is a learning approach in which students and educators engage in interactions and access learning materials through remote communication media, such as the internet, teleconferencing, or online learning resources (Cahyanto 2023).

Student engagement in e-learning can be measured through three main dimensions: cognitive, affective, and behavioral. Cognitive engagement includes understanding and processing information, affective engagement relates to students' emotions and motivation, while behavioral engagement involves active participation in learning activities (Wibowo, 2022). Research shows that students who actively engage in online learning tend to achieve better learning outcomes compared to those who are less engaged (Rusdiana, 2024).

#### 1. Forms of Student Engagement in E-Learning:

- Cognitive engagement: Cognitive engagement refers to the level of thinking and understanding students have regarding the material they are learning. In the context of e-learning, cognitive engagement can be enhanced through the use of various interactive tools such as online quizzes, discussion forums, and educational videos. Students who actively participate in these activities tend to have a better understanding of the subject matter.
- Emotional engagement: Emotional engagement includes students' feelings about their learning experience. Well-designed e-learning can create an enjoyable and engaging learning experience, making students feel more connected to the material. For example, the use of gamification in e-

learning can boost students' motivation and emotional engagement.

- **Social engagement:** Social engagement involves student interaction with classmates and teachers. In e-learning, social engagement can be facilitated through discussion forums, online study groups, and Q&A sessions. These interactions not only help students understand the material but also build a supportive learning community.
- **Practical engagement:** Practical engagement includes the application of acquired knowledge in real-world situations. In e-learning, students can engage in collaborative projects, simulations, or case studies that allow them to apply what they have learned. This helps students develop practical skills relevant to real-life situations.

2. The impact of student engagement on e-learning-based learning:

- **Improved learning outcomes:** high student engagement in e-learning is directly linked to better learning outcomes. Students who actively participate in learning activities tend to have a deeper understanding and achieve higher academic performance. Research shows that students who actively engage in online discussions and interactive assignments score higher compared to those who remain passive.
- **Higher motivation:** student engagement in e-learning can increase their motivation to learn. When students feel involved and have control over their learning process, they are more likely to stay motivated. Gamification and interactive elements in e-learning can make learning more engaging and enjoyable.
- **Development of social skills:** Social engagement in e-learning helps students develop communication and collaboration skills. Interaction with classmates and instructors through discussion forums or group projects allows students to learn teamwork and effective communication.
- **Increased learning independence:** e-learning encourages students to become more independent in their learning. With access to various resources and learning materials, students can manage their own study time and methods. Engagement in this process helps students develop time management skills and self-discipline.

Factors influencing student engagement in e-learning: learning design. An engaging and interactive design can enhance student engagement. Ambarwati (2020) emphasizes the importance of using multimedia and interactive elements in learning materials to capture students' attention. Technological Support: Good access to technology and technical support is crucial to ensure students can effectively participate in online learning. The digital divide remains a major challenge, especially in remote areas (Yulianti, 2023). Social Interaction: Opportunities to interact with teachers and classmates can boost students' motivation. Research by Wibowo (2022) shows that positive social interaction in an e-learning environment can enhance students' sense of connection and social support.

Challenges in E-Learning: Despite the many benefits of e-learning, several challenges need to be addressed, such as: Digital Divide: Not all students have equal access to technology and the internet, which can hinder their engagement in online learning (Rusdiana, 2024). Student Motivation: Some students may feel less motivated in an online learning environment, especially if they lack sufficient support from teachers or parents (Sari, 2021). Content Quality: Poor-quality or irrelevant content can reduce student engagement. Therefore, it is essential to ensure that the learning materials provided are engaging and meet students' needs (Ambarwati, 2020).

## **CONCLUSIONS**

Based on a review of articles related to e-learning-based instructional innovation: student engagement in the digital era includes curriculum innovation strategies such as facilitative and educational strategies aimed at enhancing student interaction and engagement, the use of creative learning media such as Canva or videos, gamification, visually engaging and enjoyable learning methods, and the development of critical thinking skills. Furthermore, it was found that e-learning-based instructional innovation: student engagement in the digital era has an impact on improving classroom effectiveness, enhancing students' critical thinking skills, increasing student engagement, fostering creativity and active participation, reducing educational disparities, and improving student learning outcomes.

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