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# Enhancing E-Learning in Vocational Schools: Key Characteristics of Instructional Design

**Widia Murni Wijaya [1], Liah Siti Syarifah [2], Thuok David [3]**
[1] Fakultas Ilmu Pendidikan dan Psikologi, Universitas Negeri Yogyakarta
Jl. Colombo No.1, Caturtunggal, Sleman, Yogyakarta 55281, Indonesia
[2] Institut KH. Ahmad Sanusi Sukabumi
Jl. Bhayangkara No. 33, Sukabumi, Jawa Barat 43123, Indonesia
[3] National Polytechnic Institute of Cambodia
Phum Prey Popel, SangkatSomrong Krom, Khan Po Sen Chey, Phnom Penh 12409, Cambodia
* Corresponding Author. Email: widiamw@uny.ac.id

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ABSTRACT

This study discusses the adoption of e-learning as an educational innovation to overcome physical limitations between students and teachers, especially in vocational schools. E-learning offers an alternative to conventional learning with time and place flexibility, as well as a student-centered approach. This study employs a qualitative research method with a narrative approach to analyze instructional design in the adoption of e-learning in vocational schools. The study involves 12 teachers, 12 students, and 4 school leaders from public and private vocational schools in Yogyakarta. Data were collected through interviews and analyzed using NVivo software to identify the dominant characteristics of instructional design in e-learning. The three main characteristics found are: well-stored feedback features, opportunities for users to provide feedback, and user authority to access all learning content. The research results show that feedback features in e-learning are crucial for evaluation and interaction between teachers and students. Users can provide feedback in the form of comments, which helps improve students' understanding of the learning material. Additionally, user authority to access e-learning content allows students and teachers to access materials anytime and anywhere, enhancing their flexibility and interest in using e-learning. This study concludes that effective adoption of e-learning in vocational schools can be enhanced through appropriate instructional design, with clear feedback features and access authority. This can address various challenges in vocational education, such as time and place constraints, and help in diversifying students' skills and abilities.

## INTRODUCTION

E-learning has become an educational innovation as an effort to connect students and teachers in learning despite being physically separated and distant (Ramadhana & Hadi, 2022). The communication method in e-learning utilizes networks (LAN, WAN, and the internet) as a delivery method to facilitate interaction between teachers and students in learning. E-learning can be considered an innovation because it offers alternatives compared to conventional learning (Mayer, 2019). These alternatives include new ways of preparing and delivering learning materials as well as new ways of thinking. Innovation does not necessarily mean something entirely new. Learning can take place interactively anywhere and anytime with a student-centered approach if e-learning is utilized (Dianaris et al., 2022; Rafiee & Abbasian-Naghneh, 2021). The flexibility of e-learning can be developed to facilitate learning that is not limited to the concept of knowledge alone (Putrie, 2022). It can also be developed according to the specific needs of education, particularly in vocational schools that emphasize skills.

In implementing e-learning, several components are required, including preparing learning content that can be implemented to achieve learning outcomes, selecting learning methods according to needs, adding media that can support the learning process such as informative images, conducting learning synchronously and asynchronously, and developing individual and group abilities and skills (Almaiah & Alyoussef, 2019). E-learning is considered an appropriate solution for educational problems because it offers benefits that address educational issues. These benefits include the freedom for students to learn materials, the removal of spatial and temporal constraints in attending lessons, and cost savings (Hannache-Heurteloup & Moustaghfir, 2020). Therefore, schools, especially vocational schools, need to adopt e-learning in their teaching practices.

The implementation and success of e-learning adoption are based on the quality of instructional design through the integration of technology (Al-Fraihat et al., 2020). The adoption of e-learning plays a crucial role in combining different fields that benefit students, teachers, and educational institutions. There are many concerns about unsatisfactory student performance when using e-learning, but this can be addressed through structured processes such as applying good instructional design. The benefits derived from adopting e-learning include cost reduction, transparency, quality control, and measurable standardization (Salloum et al., 2019).

Recently, several policymakers and bureaucrats in Indonesian educational institutions have implemented this instructional design with the belief that it will help them overcome the challenges posed by the traditional education system, which has become increasingly difficult to manage due to the growing demand for education (Mursyidi, 2019). However, despite a significant amount of funding dedicated to e-learning programs, the number of students and schools adopting this method remains low (Pratama & Dermawan, 2020). The suboptimal adoption of e-learning is likely to hinder the government's efforts to diversify students' skills and abilities. The challenges faced in utilizing e-learning in the school environment, especially in vocational schools, include the fact that many teachers and students have not yet maximized the use of e-learning in their learning processes, and many schools are still unfamiliar with using e-learning (Abdulmajid et al., 2017).

Several instructional design models can be used in the development of e-learning programs, including the ADDIE model, Robert Gagne's ID model, the Dick and Carey model, and the e-book approach (Santally et al., 2012). In this research, the instructional design components used in the adoption of e-learning include: selecting the appropriate instructional design model for vocational schools to guide the entire e-learning process (Pappas, 2016), the interactivity of e-learning materials (Gutierrez, 2016), collaborative work in developing and updating e-learning materials (de Jong et al., 2019; Akiba et al., 2019; Vandenhouten et al., 2014), and providing and eliciting feedback in e-learning (Brown & Voltz, 2005). Therefore, this research is crucial as it seeks to identify the dominant characteristics of instructional design to be implemented by schools to enhance the adoption and effective use of e-learning, particularly in vocational schools.

## METHOD

The qualitative research method in this study uses a narrative approach (Creswell, 2013) aimed at establishing a sequence of events for the instructional design aspects used in the adoption of e-learning being studied. The narrative approach is intended to build an explanation of the dominant instructional design features in the adoption of e-learning in vocational schools. The informants in this study consist of 12 teachers, with six teachers each from public vocational schools and six teachers from private vocational schools, 12 students, with six students each from public vocational schools and six students from private vocational schools, and 4 key informants who are school leaders from different schools.

In this study, the credibility, trustworthiness, consistency, and appropriateness of qualitative data were ensured by clarifying the nature of the research, establishing a trust relationship with the respondents, keeping accurate and detailed field notes; transcribing verbatim accounts of information from respondents; involving respondents in reviewing transcriptions and peer debriefing; and rigorous training for interviewers (Glaser & Strauss, 2017). Informed consent was obtained by reading a consent statement to the respondents regarding the research being conducted, the benefits obtained, and how the findings would be used. After that, respondents were asked if they were willing to participate, and if they were not willing, they were free to opt out. If respondents decided to participate, they were given a consent form to sign.

Qualitative data collection techniques include informant interviews. The informant interview guide was used as a tool to obtain responses from informants. This guide was conceptualized as a comprehensive guide covering all the necessary information from the respondents. Qualitative data analysis began with data collection, where data was recorded and supported by audio recording, transcription was done verbatim, and some samples were referred back for cross-referencing. Data was also coded, categorized, and themed (Corbin & Strauss, 2014). The coding procedure used a comparative sampling method, a technique that allows for the collection of large amounts of data due to its iterative potential. NVivo software was used in the coding process to assist in data management and to facilitate the data reduction process.

## RESULTS AND DISCUSSION

Results

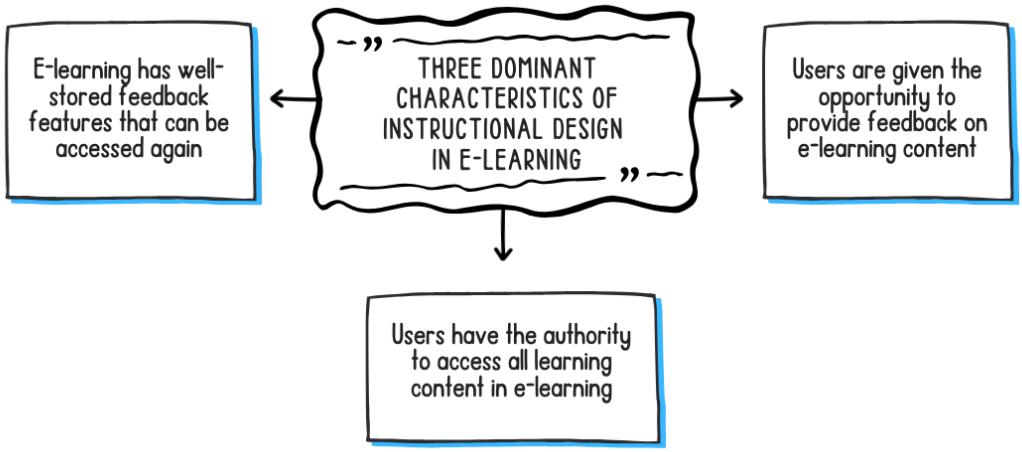


Figure 1. Key characteristics of instructional design

Based on the interview results, it was found that there are three key statements that received the primary focus regarding the respondents' level of agreement. This was done to determine the dominant features of instructional design as an effort to enhance the implementation of e-learning in vocational schools. These three items, as shown in Figure 1, include: 1) e-learning

has well-stored feedback features that can be accessed again; 2) users are given the opportunity to provide feedback on e-learning content; and 3) users have the authority to access all learning content in e-learning.

This study involved respondents from four different vocational schools in Yogyakarta province, including two public vocational schools (A and B) and two private vocational schools (C and D). The interview transcripts from these respondents were analyzed using NVivo software. One feature available in NVivo is the word frequency query. This function was used to visualize the most frequently occurring words in the data. Based on the analysis results using this feature, it was found that the group of words most frequently appearing in the interviews related to the three dominant instructional design characteristics in e-learning (Figure 2), including "e-learning," which appeared in 6.69% of the entire data, followed by "teacher," "comment," "score/grade," "material," and "student."

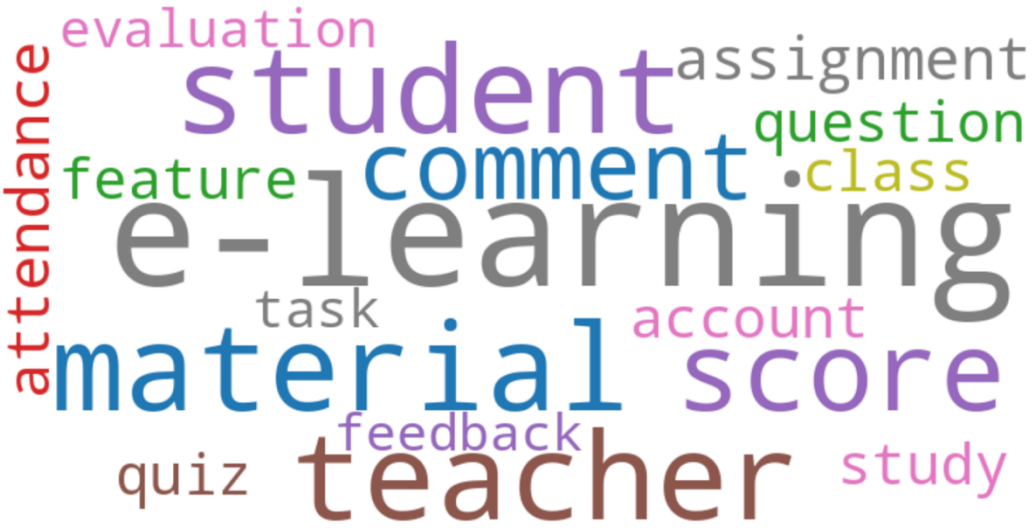


Figure 2. Word frequency query

For visualization purposes, this study also utilized project mapping to explore and present the data relationships derived from coding using NVivo. The following themes were identified from respondents' statements based on the three dominant characteristics of instructional design in e-learning:

1. E-learning features feedback

Feedback features are essential in e-learning. These features are typically integrated into each e-learning content to provide opportunities for teachers and students to give feedback. The impact of these feedback features can build and enhance users' understanding of the learning materials. According to Figure 3, indicators of feedback features as perceived by users include their usefulness for evaluating learning, the necessity of feedback features to support the learning process, and as a platform for user interactions in e-learning. This finding is reinforced by the statement from a teacher at vocational school D emphasizing the importance of feedback features in e-learning, stating:

"There is a service to provide comments as student learning evaluations in e-learning."

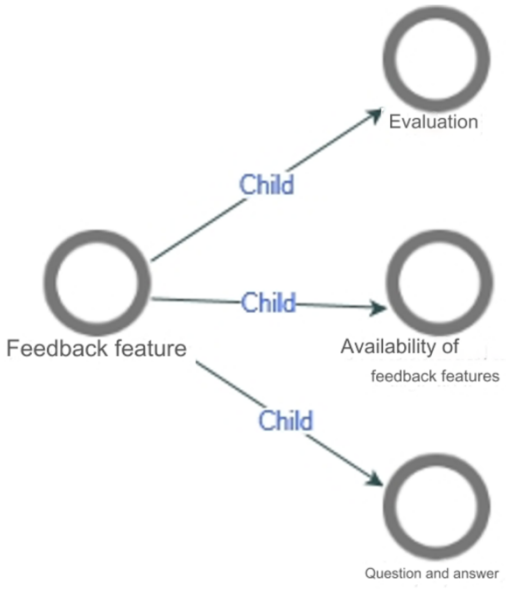


Figure 3. Project map of the feedback feature

2. Users can provide feedback in e-learning

To support learning through e-learning, the presence of feedback is crucial for its users. Feedback in e-learning serves as a means for teachers and students to interact with each other. In e-learning, feedback can be given in various ways and serves multiple functions. As shown in Figure 4, it illustrates the relationships within the feedback category. Indicators of the feedback category include its role as a means of sharing information, an evaluation tool, with chat features being the most frequently used feedback method by teachers, and comments being the form of feedback teachers provide to students.

Feedback in the form of comments is most commonly used by teachers as a means of evaluating student assignments, as stated by a student from vocational school C:

"So, after doing practice exercises, the teacher immediately gives the grades. For comments, if the grade is low, we are given comments on what needs improvement and instructed to make corrections."

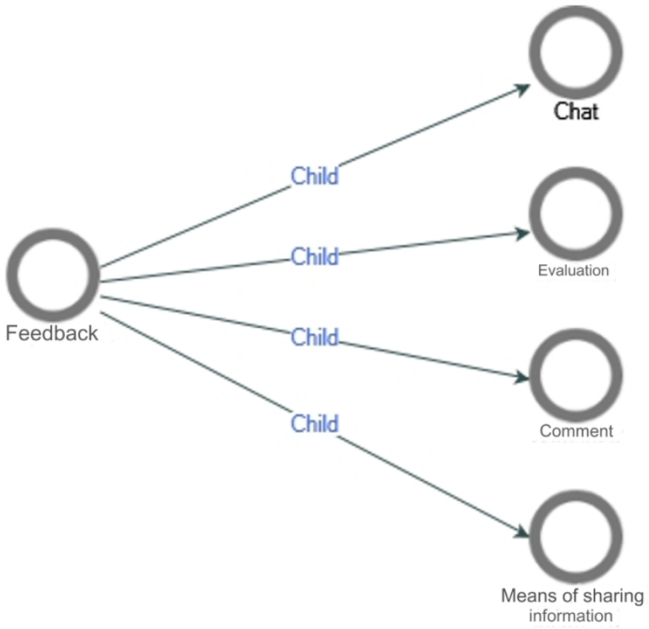


Figure 4. Project map of feedback

3. Users have authority to access content in e-learning

To ensure the security of e-learning, developers typically grant authorization to users, allowing only specific users to access e-learning content. This authorization is used to grant permissions so that users can access various information and perform specific functions. Meanwhile, Figure 5 displays the relationships within the user authority category. Indicators of this category include users who have authority to access e-learning, users can access e-learning anytime and anywhere, and users can easily search for content in e-learning.

In e-learning, user account authorization is used to ensure that only registered users such as students, teachers, and school staff access e-learning. This is done to prevent unauthorized users from accessing e-learning. As e-learning users, students and teachers are granted access to all content and can access this content anytime and anywhere. A student from vocational school A mentioned:

"I rely more on e-learning because I can find the materials I need."

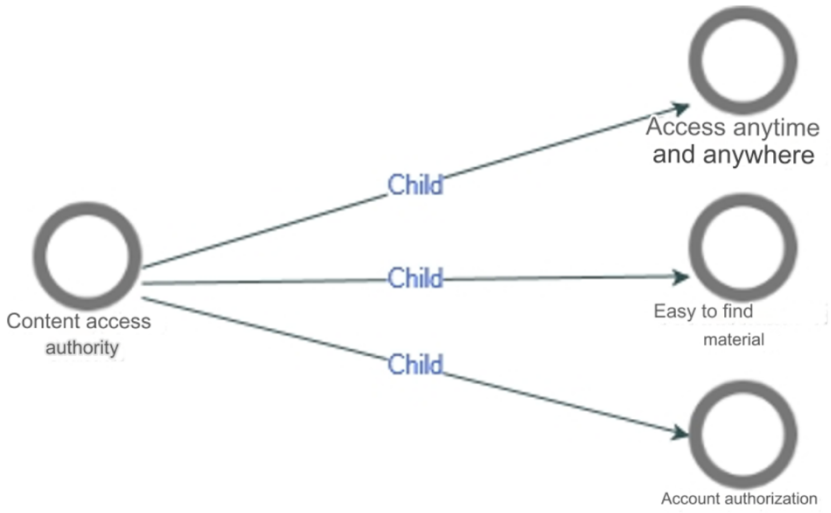


Figure 5. Project map of content access authorization

Discussion

The use of e-learning instructional design models is one of the widely adopted learning models today, providing benefits for both students and teachers. Students and teachers use e-learning to enhance the quality of education as it is perceived to offer advantages over traditional learning methods (Rahyasih et al., 2023; Wijaya et al., 2022). One of the key features of e-learning desired by both students and teachers is the feedback feature. They argue that the feedback feature is crucial in e-learning to help students receive feedback on their work. Moreover, students can use this feature to share their learning experiences with teachers for evaluation and improvement of e-learning content (Revythi & Tselios, 2019). The presence of feedback features in e-learning promotes student independence and creativity. Additionally, e-learning facilitates monitoring of student learning outcomes (Nadziroh, 2017).

One of the factors influencing the adoption of e-learning in schools is the use of appropriate instructional design. Effective instructional design enhances student and teacher understanding (Sweller et al., 2019; Wong et al., 2019), particularly in vocational schools (Rahyasih et al., 2023). Vocational schools have distinctive characteristics and instructional designs compared to general secondary schools. Education in vocational schools focuses on practical development and project-based training (Wijaya & Patonah, 2019). For vocational school students, adopting e-learning significantly aids them in the learning process, especially in theoretical subjects. Key features of e-learning, such as the feedback feature, help students see the feedback provided by teachers on their work. This helps students assess their achievements and shortcomings in learning through the feedback provided by teachers.

Based on research findings, it was found that teachers and students in vocational schools can provide feedback in e-learning to support learning. This is reinforced by Debattista (2018) regarding comprehensive rubrics for instructional design in e-learning. The rubric outlines that in learning assessments, students and teachers should be given the opportunity to provide feedback. Furthermore, it explains that students are allowed to access learning outcomes and feedback at any time, enabling them to track their learning progress.

From the research findings, it is stated that teachers often provide feedback in the form of comments regarding deficiencies in students' assignments so that students can improve their grades where necessary. This feedback is aimed at students with the goal of verifying correctness, which is included in corrective feedback (Istenič, 2021). Corrective feedback is not limited to correcting students' mistakes but can also support low self-confidence (Pratama & Dermawan, 2020). Instead of simply verifying whether answers are right or wrong, feedback can be given by explaining the correct answers and providing additional information (Finn et al., 2018). Corrective feedback coupled with this additional information makes it easier for students to understand the mistakes made in their assignments. It can be said to boost low self-confidence because such explanations increase students' confidence in their initial answers (which might have been correct). Of course, in providing explanations and additional information, it is not advisable to be too lengthy and complex as students may not read them, rendering the information irrelevant.

According to Muktiarni et al. (2020), e-learning must provide a well-designed feedback system so that teachers and students have diverse learning opportunities for the future of education. The feedback system provided in e-learning should facilitate both teachers and students in giving feedback so that students can improve competencies that have not been achieved. The utilization of feedback in e-learning can enhance the quality of learning because it provides space for teachers and students to align perceptions regarding the content available in e-learning (Istenič, 2021). In other words, this feedback can enhance the adoption of e-learning (Jensen et al., 2021; Bigirwa et al., 2020). Based on the data findings, 17 respondents have mentioned the use of feedback in e-learning, indicating that the feedback feature has been used by teachers in vocational schools in adopting e-learning. The most frequently given feedback by teachers is in the form of comments utilizing the chat feature in e-learning. Not only teachers but also students should be given the opportunity to provide feedback in e-learning. This feedback can serve as a means for students to demonstrate their understanding of the messages conveyed by teachers regarding the content in e-learning.

In addition to the feedback feature, every e-learning developer in vocational schools tasked with managing e-learning should provide authorization to every user, both teachers and students, to access e-learning. Essentially, this authorization aims to maintain the privacy and security of e-learning, making it essential for the adoption of e-learning. The adoption of e-learning in vocational schools involves students and teachers as actors in education and in the adoption of e-learning, referred to as users of school e-learning. However, in every school, e-learning users consist of e-learning developers, teachers, and students. E-learning developers manage the e-learning website, teachers manage the content and assignments in e-learning, and correct students' learning outcomes, while students serve as end-users of e-learning to access materials and assignments (Marwan et al., 2022). This demonstrates that each user has different levels of authority between students, teachers, and e-learning developers.

Based on research data from several vocational schools, 11 respondents consisting of two teachers, seven students, and two school leaders stated that the need for authorization in adopting e-learning is necessary. Each student, teacher, and e-learning developer as actors in e-learning certainly needs to have a registered username and password to log in to e-learning and access e-learning content (Sihotang, 2017). The e-learning content referred to here encompasses all features provided in each e-learning platform to meet the needs and implementation of online learning. User authorization in e-learning ensures that users are registered individuals within the school. This demonstrates that user authorization to access e-learning is an urgent necessity for the adoption of e-learning in schools. User authorization to access e-learning content is intended to provide flexibility for users to access various features and specific information available in e-learning. The features developed and needed by users to access e-learning are comprehensive and diverse.

Through e-learning, teachers can manage learning materials or content online and integrate digital learning contents into e-learning instructional design (Nina et al., 2022). The presence of e-learning is expected to enhance teachers' flexibility in delivering learning content to students and facilitate students in obtaining learning materials without being restricted by time and space (Salloum et al., 2019).

The research findings reveal that students and teachers, as users of e-learning, are granted authority to access all content anytime and anywhere. Students rely more on e-learning if the content and materials meet their needs (Vladova et al., 2021). Moreover, the flexibility of accessing e-learning anywhere and anytime can enhance students' interest in adopting e-learning (Cheng, 2019). The utility factor of e-learning in education also influences the level of interest and satisfaction among e-learning users (Gunesekera et al., 2019). Supported by the research findings of Gunesekera et al. (2019), it is proven that students' access to e-learning content affects their satisfaction. Indicators influencing satisfaction include information quality, control, supervision, and flexibility in accessing e-learning content. Flexibility in accessing content here is synonymous with granting user authorization to access e-learning. The project map of content access authorization from research in several vocational schools shows that content access authority in e-learning can provide e-learning users with accessibility features such as anytime and anywhere access, easy material search, and account authorization.

Regarding content access authority, students and teachers as users already have their own accounts to log in and access e-learning content. This proves that only registered users have the authority to access school e-learning. In addition, teachers who teach are also authorized to access school e-learning. Teachers have content access authority in e-learning to upload assignments, learning materials, assess student assignments, and monitor students' academic progress through providing feedback on student learning outcomes (Rahyasih et al., 2023). Meanwhile, students have the right to access e-learning content authority to view and download materials and assignments, take quizzes, and engage in discussions with teachers or peers (Setiawan et al., 2022). Thus, it can be concluded that e-learning user authority is granted to registered e-learning users. Furthermore, users can easily access e-learning content anytime and anywhere.

## CONCLUSION

The use of e-learning instructional models provides various significant benefits for students and teachers in vocational schools. E-learning not only enhances the quality of education by offering more flexible and diverse access but also facilitates interaction between students and teachers through crucial feedback features. This feature not only allows students to receive feedback on their performance but also expands the space for teachers to evaluate and improve learning content. Feedback, whether corrective or informative, has proven to play a vital role in enhancing students' understanding and building better self-confidence. This aligns with findings indicating that students are more motivated and satisfied with their learning when they feel they have the opportunity to contribute and receive open feedback in e-learning. Furthermore, the importance of user authorization in accessing e-learning content in schools underscores the need for a structured system to safeguard security and privacy. This authorization ensures that only registered users have access to the e-learning platform, emphasizing the critical importance of access control in managing and utilizing this technology in educational settings. As we face a future of education increasingly driven by technology, it is recommended that the development of e-learning continues to be enhanced, including the integration of features that support interactive and project-based learning. Teachers also need to be trained to effectively utilize e-learning to support various learning styles and facilitate inclusive learning environments. Additionally, policies and regulations supporting the effective and safe implementation of e-learning in every educational institution are essential. Thus, e-learning becomes not just an additional tool in education but an integral solution in promoting equitable access to quality education for all students in the future.

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