



Systematic Literature Review: Implementation of Online Learning Based on Education Levels in Indonesia

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Abstract

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The COVID-19 pandemic has significantly accelerated the adoption of online learning, prompting extensive research on its implementation across various educational levels in Indonesia. This study employs the Systematic Literature Review (SLR) method, analyzing 13 articles from the GARUDA database, published between 2019 and 2023. The findings reveal diverse platforms utilized for online learning, including Google Classroom (3 mentions), Quizizz (2 mentions), Edmodo (3 mentions), WhatsApp (2 mentions), and custom-developed platforms. At the primary and secondary education levels, platforms like Quizizz and Edmodo were associated with improvements in student motivation (42.5% increase in motivation) and learning outcomes (up to 84% in comprehension improvement for specific materials). However, challenges such as limited internet access and reduced interaction hindered learning experiences. In higher education, Google Classroom was the most frequently cited platform, enhancing accessibility and learning independence. Despite these benefits, issues such as unstable internet connectivity, skill-based material comprehension, and limited engagement persisted. This study concludes that online learning has notably improved accessibility, motivation, and learning outcomes, with significant potential to enhance educational quality. However, addressing barriers such as technical limitations and fostering better interaction are essential for further optimization. These insights provide valuable guidance for refining online learning practices and policies in Indonesia.

Keywords:

Online learning; Distance Learning; Systematic Literature Review; Teknologi Pembelajaran

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INTRODUCTION

As we know, the COVID-19 pandemic began to spread in 2019 and impacted various activities in society, including in the field of education. Almost all affected countries, including Indonesia, decided to temporarily close face-to-face learning activities across all educational levels as a response to the pandemic (Syah, 2020). In line with the spread of the pandemic in Indonesia, the government issued Circular Letter Number 4 of 2020, which discusses the Implementation of Education Policies During the COVID-19 Pandemic Emergency (Dewi, 2020). Referring to this



government decision, face-to-face learning was replaced by online learning. This was done to ensure that the learning process continued (Annur & Hermansyah, 2022). Indirectly, the impact of this pandemic has driven various aspects of education to adopt online learning. Previous research on online teaching and learning processes generally indicates that such a transition is typically conducted voluntarily and/or has been planned. However, little is known about the emergency transition due to the COVID-19 pandemic (García-Peñalvo, Corell, Rivero-Ortega, Rodríguez-Conde, & Rodríguez-García, 2021; Iglesias-Pradas, Hernández-García, Chaparro-Peláez, & Prieto, 2021).

Supporting online learning processes also requires tools for academic assessment support. Information and communication technology (ICT), along with internet-based learning resources and applications, has proven to enhance the learning process by increasing students' interest, creativity, and motivation (Lin & Wu, 2016). Online learning encompasses more than just online content and tasks sent through social media applications. Like classroom learning, online learning must be planned, implemented, and evaluated (Daheri, Juliana, Deriwanto, & Amda, 2020). Based on various studies, many distance learning programs are successful, and when students receive adequate support, they thrive. However, many students still do not receive adequate educational support due to uneven social outcomes and limitations caused by the pandemic (Flack, Walker, Bickerstaff, & Margetts, 2020).

Several studies related to online learning have been conducted across all educational levels, from elementary, junior high, and senior high schools to higher education. There are three levels of educational units: Basic Education, Secondary Education, and Higher Education. Basic Education covers elementary to junior high schools, while Secondary Education includes senior high schools and vocational schools. Higher Education consists of diploma, undergraduate, master's, professional, and doctoral education offered by universities (Suciati, Mailili, & Hajerina, 2022). Based on the above, this study will focus on two research subjects in the education unit levels: Basic-Secondary Education and Higher Education. This study uses a Systematic Literature Review (SLR) approach, sourcing data from the GARUDA database to analyze trends and issues related to the implementation of online learning in Indonesia based on articles published from 2019 to 2023. This review will examine three main factors: platforms, impacts/evaluation of online learning, and challenges encountered.

METHODS

The research method used is the Systematic Literature Review (SLR), a systematic and objective approach for collecting, evaluating, and analyzing relevant evidence from various previously published references (Suciati dkk., 2022). The details of the three stages in SLR are as follows:

Planning Stage

In this systematic literature review approach, the initial stage required is planning. In this stage, the researcher selects the research topic, focusing on the implementation of online

learning in Indonesia. Next, article selection criteria are established based on references from the GARUDA (Garba Rujukan Digital) database, covering the years 2019 to 2023. This study includes keywords related to the implementation of online learning in Indonesia for Basic-Secondary Education and Higher Education levels.

Conducting Stage

The conducting stage is the implementation phase in the Systematic Literature Review (SLR) process. This stage begins with searching for articles that meet the criteria and match the previously defined keywords. After performing the search, a total of 97 articles matching the keyword criteria were obtained as the research population. Then, inclusion and exclusion criteria were applied to the population, resulting in 13 articles that met the requirements.

The inclusion criteria applied in this research include SINTA-indexed journals, academic proceedings, journal publications within the last five years, experimental and developmental research types, and educational levels covering elementary, junior high, senior high/vocational schools, and higher education. The exclusion criteria include titles deemed irrelevant, unavailable full-text articles, abstracts that lack relevance, and research findings that are not clearly concluded.

The article selection process then involves data synthesis to analyze and evaluate research findings from various articles. Data synthesis in this research will be presented descriptively.

Reporting Stage

The final stage in SLR research is Reporting. In this stage, the researcher compiles a report on the analysis and evaluation results from the literature review conducted, following a specific format.

RESULTS & DISCUSSION

After analyzing the articles, 13 articles met the research criteria. The findings from this review are outlined based on the SLR method, with an analysis focused on the platforms used, evaluations of online learning implementation, and the challenges faced. This approach provides an in-depth picture of the current state of online learning in Indonesia, based on educational levels, and offers information that can be used to improve effective teaching practices and policies in the future. The implementation of online learning across educational levels in Indonesia is comprehensively discussed below as a result of the Systematic Literature Review (SLR).

Primary and Secondary Education Levels

Six articles were deemed relevant to this study and met the criteria for discussing the implementation of online learning at the primary and secondary school levels. The detailed analysis of these articles is explained as follows.

Platforms

In the table for Primary and Secondary Education, several platforms were mentioned in the articles. The frequency of these platforms is as follows:

1. Edmodo: 2 articles

2. LMS: 1 article
3. Quizizz: 1 article
4. WhatsApp: 1 article
5. Google Form: 2 articles
6. Google Meet: 1 article
7. Zoom: 1 article
8. Researcher Development: 2
 - a. SINAU.ID: 1 article
 - b. Web- and Android-based Applications: Cited in 1 article

There is a variation in platform usage for implementing online learning, as well as in teaching methods and emphasized aspects, such as student experience, learning outcomes improvement, and researcher development. This variation in platform usage aligns with research by (Karyodiputro, Hidayat, & Ningsih, 2022). Additionally, other articles found the use of platforms developed independently by researchers or those readily available on mobile devices, which aligns with the research by (Irma & Hidayat, 2021) and (Nur, Junjunan, Muflihin, & Muttaqin, 2022).

Impact

The following is a discussion of the positive and negative impacts identified in the research.

Table 1. Impact on Primary and Secondary Education Levels

No	Title	Impact
1	Implementasi Pembelajaran <i>Online</i> Berbasis Web dan Android dalam Peningkatan Karakter Peserta Didik di MI At-Taqwa Bondowoso. (Karyodiputro dkk., 2022)	Online learning based on web and Android enhances student character (confidence, responsibility, honesty, and discipline) and allows students to ask questions and contribute to the learning process.
2	Implementasi Pembelajaran <i>E-Learning</i> Terhadap Motivasi Belajar Siswa Smp Al-Islah Surabaya Selama Covid-19. (Nur dkk., 2022)	E-learning has a positive impact on student motivation, increasing it by 42.5%, while about 57.5% is influenced by other variables. E-learning is a positive factor, but not the only one affecting student motivation.
3	Pengaruh Media Penilaian Formatif <i>Online</i> Quizizz Terhadap Hasil Belajar Siswa Materi Sistem Periodik Unsur. (Bahriah, Dewi, & Irwandi, 2021)	The use of Quizizz as an online formative assessment affects students' learning outcomes on the periodic table of elements. The treatment results show an improvement in students' learning outcomes, with increased achievement percentages in cognitive levels C1-C5.
4	Implementasi Aplikasi Sinau.Id Pada Pembelajaran Bahasa Indonesia Secara Daring Pada Sekolah Dasar di Kecamatan Bumiayu. (Irma & Hidayat, 2021)	This article discusses online learning using the SINAU.ID application for learning. It concludes that the application is easy to use and learn, with features that meet learning needs, although the effects are not fully explained.

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| 5 | Implementasi Aplikasi Edmodo Sebagai Efektivitas Pembelajaran Daring Di Masa Pandemi Covid-19 Di Mi Azzainiyah Ii Grinting Paiton Probolinggo.
(Septantiningtyas, Rosmila, & Husein, 2021) | Students respond positively to the use of Edmodo. This positive response can be seen as an indicator of a good learning experience. |
| 6 | Implementasi Kebijakan Pembelajaran Jarak Jauh Pada Masa Pandemi Covid-19 (Studi Kasus Di Smpn Kabupaten Garut).
(Harlis, Rizqi, & Ramdhani, 2022) | In this article, the use of online learning faces many challenges and is not optimal. The main impact is the hindered understanding of students and the limited interaction in online learning. |
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Each main point discusses the results and effects of specific learning methods or platforms, providing an overview of the successes, challenges, and student responses when using online learning.

Positive Impacts:

1. Online Learning (Web and Android): Enhances student character (confidence, responsibility, honesty, and discipline) and allows students to ask questions and contribute to the learning process.
2. E-learning During the COVID-19 Pandemic: Positively affects students' willingness to learn, increasing their motivation to learn by 42.5%.
3. Quizizz: This online assessment tool influences students' learning outcomes on the topic of the periodic table of elements, improving students' learning outcomes, particularly at cognitive levels C1-C5.
4. SINAU.ID Application for Online Learning: Easy to use and learn and also the six features meet educational needs.
5. Use of Edmodo: Positive student responses to the use of Edmodo indicate a good learning experience.

Negative Impacts:

1. Utilization of Online Learning in General:
Generates several negative and suboptimal impacts.
The main impact is the hindered understanding of students and the limitations of interaction that occur in online learning.

Therefore, the positive impacts include enhancements in student character, motivation to learn, and learning outcomes, while the negative impacts relate to challenges and suboptimal online learning experiences, including hindered understanding and limited interaction. Based on the review of the articles, it is evident that online learning at the primary and secondary school levels tends to yield more positive effects.

Challenges

Based on previous research, several challenges have been highlighted in the context of device usage in online learning, the implementation of online learning, and distance learning

practices. Some of these challenges include technical limitations, accessibility aspects, and challenges in maintaining student motivation.

Challenges related to device usage, such as limited network availability, time constraints, and the potential for technical errors, can hinder learning activities according to (Karyodiputro dkk., 2022). Some students who are not accustomed to using learning device applications may face difficulties in adjusting.

Challenges in the implementation of online learning, such as issues regarding technology readiness and accessibility, can pose major obstacles. Although not clearly outlined, factors impacting student motivation encompass many variables.

Challenges in the implementation of online learning may include technical barriers, such as the availability of operational facilities, which can hinder the continuity of learning practices (Harlis dkk., 2022). Students who struggle to understand the material and lack interaction can affect the effectiveness of distance learning.

Overall, this article provides a better understanding of the various challenges that may be encountered in online and distance learning. This knowledge is important for creating effective innovations and improving the quality of education.

Higher Education Level

Seven articles relevant to this research were found, meeting the criteria and discussing the implementation of online learning at the higher education level. The following are the results of the article analysis explained in the subsequent analysis.

Platforms

In the table for Higher Education, several platforms were mentioned in the articles. Below are the platforms cited and their frequency of occurrence:

1. Edmodo: mentioned 1 time.
2. Google Classroom: mentioned 2 times.
3. Zoom: mentioned 1 time.
4. Moodle: mentioned 1 time.
5. Whatsapp: mentioned 1 time.

According to the data on higher education levels, it can be concluded that several platforms are used in the context of higher education. Google Classroom is the most frequently mentioned platform, appearing twice, followed by Edmodo, Zoom, Moodle, and WhatsApp, each of which was mentioned only once. The use of Google Classroom has been discussed in research by (Retnaningsih, 2020) and (Mandome & Puasa, 2020). Although the frequency of platform mention does not always reflect preference or effectiveness, it can be concluded that the various platforms used in the higher education environment exhibit a diverse level of utilization.

Impact

Below is a discussion of both the positive and negative impacts from the research findings

Table 2. Impact on Higher Education Level

No	Title	Impact
1	Implementasi Pembelajaran	In addition to providing ease of access and flexibility in

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- Daring Berbasis Edmodo Pada Mata Kuliah Evaluasi Program Kepelatihan Di Masa Pandemi Covid-19. (Ningsih, 2020) terms of time and place, online learning can also reduce printing costs and accelerate the correction process and feedback from teachers.
- 2 *E-Learning System Sebuah Solusi Pragmatis Program Vokasional Semasa Pandemi Covid-19.* (Retnaningsih, 2020) By giving student the opportunity to manage practical materials independently, online learning enhances student motivation, learning processes, and their achievements. Furthermore, online learning improves students' problem-solving abilities, creativity, and capacity to act in real-world situations.
- 3 Efektifitas Implementasi Pembelajaran Daring Google Classroom Pada Mahasiswa Ilmu Komunikasi Universitas Sariputra Indonesia Tomohon. (Mandome & Puasa, 2020) Students perceive many benefits from online learning, such as easy access to course materials, speed and effectiveness in completing assignments, and increased learning productivity. Additionally, Google Classroom greatly facilitates the teaching and learning process.
- 4 Pengaruh Pemanfaatan *E-Learning* Terhadap Motivasi Dan Prestasi Belajar Pada Mata Kuliah *E-Commerce* Di Universitas Telkom Bandung. (Sary & Prasetio, 2021) Although the results indicate that there was no significant improvement in learning, there may be other factors that can be identified. For example, students might acquire better technological skills or have more interactions.
- 5 Pembelajaran Berbasis *Online* Aplikasi *Quizizz* Untuk Meningkatkan Pemahaman Mahasiswa Pada Mata Kuliah Pengembangan Profesi Guru Di UIN Raden Fatah Palembang. (Ananda, Achadi, Oviyanti, & Al Ghazali, 2022) The use of Quizizz increases student participation, enhances their understanding, and makes learning more enjoyable. The results show an improvement in understanding of 0.84%.
- 6 Analisis Implementasi Teknologi Pembelajaran di Bebas Umpo. (Nimasari, Cobantoro, Andika, & Setyawan, 2023) In the e-learning class at STAcEP, the research results indicate that the level of student independence in learning is categorized as "good," with scores reaching the 70% interval. This evaluation is supported by interviews and in-depth observations. To improve the validity and generalization of the data, future research is expected to involve a larger sample, not limited to just one faculty. Additionally, the focus of the research could be expanded to explore aspects of usability and user experience.
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- 7 Implementasi E-Learning Pada Masa Pandemi Covid-19 Oleh Dosen Dan Taruna/Taruni Politeknik Maritim Ami Makassar (Polimarim). (Loise, 2021)
- The learning process has been going well, but there are still some issues that prevent the achievement of the expected optimal level.
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There are many benefits to online learning, such as students becoming more accessible and productive, as well as the use of technology like Google Classroom and Quizizz, as indicated in the articles. However, some obstacles and potential issues that need attention are also mentioned. Here is a summary of the potential positive and negative impacts:

Positive Impacts:

1. **Ease of Access and Flexibility:** This is beneficial because it provides students with easy access and flexibility regarding time and location
2. **Efficiency and Enhanced Understanding:** Reduces printing costs, speeds up the correction process, and provides quicker feedback from teachers.
3. **Student Motivation and Achievement:** Positively increases student motivation, learning processes, and academic performance. It also enhances creativity, problem-solving abilities, and the capacity to act in real-world situations.
4. **Benefits of Online Learning:** Easy access to subject materials, speed and effectiveness in completing assignments, and increased learning productivity.
5. **Student Participation and Understanding:** Increased student participation through Quizizz and better understanding from quizzes.
6. **Learning Independence:** Students exhibit a good level of learning independence in the e-learning class at STAcEP, according to research by (Ananda dkk., 2022).

In addition, there are also potential negative impacts observed in the implementation of online learning, including:

1. **Achievement Has Not Reached Optimal Levels:** Although the learning process has been going well, there are still some issues that have prevented the expected results from being achieved, consistent with the findings of the study by (Loise, 2021).
2. **Lack of Significant Progress:** Results indicate that learning has not shown significant improvement. There may be other factors that need to be identified.

Challenges

In the discussion of the article review, three main obstacles in implementing online learning were identified:

1. **Device Usage Challenges** according to research by (Ananda dkk., 2022; Ningsih, 2020; Sary & Prasetyo, 2021).
 - a. **Limited Internet Connection:** Inadequate internet connectivity hinders device usage.
 - b. **Lack of Understanding of the Application (Quizizz):** Students face difficulties in using the Quizizz application, including network issues, time constraints, and a lack of understanding of the application.

- c. **Technical Issues in Video Playback:** These technical problems obstruct the use of devices to play videos.
2. **Challenges in Student Engagement in Online Learning** based on research by (Sary, F. P., & Prasetyo, A, 2021) and (Nimasari, E. P., et al., 2023)(Nimasari dkk., 2023; Sary & Prasetyo, 2021).
 - a. **Difficulty Understanding Skill-Based Material:** Students encounter challenges in comprehending skill-based material online.
 - b. **Limited Engagement and Direct Interaction:** Students have limited engagement and lack direct interaction with teachers in an online learning environment.
 - c. **Navigation and Interaction Challenges (E-Learning):** Students struggle to find and understand skill-based material.
3. **General Challenges for Online Learning Implementation:**
 - a. **Inconsistent Stability and Availability of Material (E-Learning):** It is difficult to maintain the stability and availability of learning materials consistently.
 - b. **Inaccessible Material (E-Learning):** Challenges arise when learning materials cannot be accessed by students.
 - c. **Registration and Learning Process Issues (E-Learning):** Problems with registration in the Learning Management System (LMS) and challenges in the online learning process.

In the conducted research, various obstacles faced by online learning were identified, categorized into three main groups: issues with device usage, problems with the application of online learning by students, and issues with the overall implementation of online learning. Each category encompasses various challenges that need to be addressed to enhance the efficiency of internet-based learning.

CONCLUSION

Through the analysis results of comparative data between online learning at the elementary-secondary and higher education levels using the Systematic Literature Review (SLR) method, various variations in platform usage, impacts, and challenges faced have been identified.

Indirectly, the implementation of online learning has become increasingly prevalent due to the COVID-19 pandemic. Based on the reviewed articles, the application of online learning in Indonesia has seen significant research activity over the past five years. Online learning is applicable across all levels of formal education in Indonesia. Despite the differences in characteristics between the elementary-secondary and higher education levels, several common patterns can be identified. For example, at the elementary-secondary education level, the diversity of platform usage, such as Edmodo, LMS, Quizizz, and others, reflects a variety of approaches in the implementation of online learning. Meanwhile, at the higher education level, Google Classroom is the most frequently mentioned platform, indicating a diversity of use within that environment.

Online learning offers many significant benefits across various educational levels. Learning outcomes, character development in students, and motivation to learn continue to improve, particularly in elementary-secondary education and higher education. The main advantages of using various platforms such as Edmodo, Google Classroom, and Quizizz

include ease of access, flexibility, and efficiency in the learning process. These platforms create a learning environment that supports student growth and provide a positive technological response to learning.

However, despite the benefits of online learning, there are several issues that need to be addressed. Limited internet connectivity, technical problems when using devices, and challenges in maintaining direct interaction between students and teachers are some of the obstacles hindering online learning. Other general challenges, such as material stability, availability of access, and student motivation issues, also pose barriers to the implementation of online learning. When there are differences in educational levels, specific problems may need to be addressed according to the needs and characteristics of each level.

Several considerations can be recommended for further research on the implementation of online learning based on educational unit levels in Indonesia. First, exploration of Specific Impacts: Future research can delve deeper into the specific impacts of certain online learning platforms with a focus on student experiences, teaching effectiveness, and the development of specific skills. Determinants of Success: Discussing the success factors in the implementation of online learning from the perspectives of teachers and students can provide practical guidance on how to enhance the quality of distance education. Lastly, development of Learning Models: Building more creative and interactive online learning models can be a research focus. A deeper understanding of the characteristics of successful online learning can serve as a foundation for improving instructional design suitable for the levels of educational units in Indonesia.

To improve the overall quality of online learning, the focus of improvements should be on technical challenges, ease of access, and student motivation. Online learning can be a more efficient and inclusive alternative at all educational levels due to these factors.

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