



An Analysis of Students' Online Learning Readiness in Indonesian Higher Education Post-COVID-19 Era: A Bibliometric Analysis and Systematic Review

Holikul Mubin^{1*}

¹*State Islamic University of Maulana Malik Ibrahim Malang, Indonesia

holikulmuhibbin@gmail.com

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Abstract: This study aims to analyze students' readiness to engage in online learning in Indonesian higher education institutions during the post-COVID-19 era through a systematic review approach. Data were collected from 10 recent scientific articles published between 2023 and 2024 that met strict inclusion criteria. The analysis reveals that overall student readiness remains low, influenced by key factors such as limited access to technology, ineffective time management, low learning motivation, and unfavorable socioeconomic conditions. Additionally, psychological aspects of students, including emotional resilience and commitment to online learning, remain significant challenges. These findings highlight the need for integrated interventions to enhance digital literacy, technical support, as well as motivation and psychological readiness to make online learning more effective and sustainable in Indonesian higher education. The implications of this study are relevant for the development of adaptive higher education policies in the digital era.

Keywords: Online Learning Readiness, Higher Education, Post-COVID-19, Digital Literacy, Indonesia.

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INTRODUCTION

The COVID-19 pandemic has triggered a paradigm shift in global education systems, compelling a rapid transition from conventional face-to-face instruction to online and hybrid learning modalities (Rajib & Puspita 2022; Suharyanto et al., 2023). This transformation ensured educational continuity but simultaneously revealed disparities in digital infrastructure, literacy, and institutional readiness (Jahidi et al., 2023). Across the world, online education emerged not merely as an emergency solution but as a foundational model shaping the future of higher education. In developing countries, however, this rapid adaptation highlighted inequalities and varying levels of preparedness among learners and institutions. Consequently, the pandemic not only accelerated digital transformation but also positioned technology as an integral and enduring component of modern education (Eli-Chukwu et al., 2023; Chukwuere, J. 2024).

In Indonesia, the enforcement of online learning policies represented both an opportunity and a challenge for higher education institutions. On the one hand, online learning ensured the continuity of academic activities during social restrictions; on the other hand, it exposed major disparities in access, digital competence, and learning motivation among students (Husen et al 2023; Kim et al., 2022; Li, 2022). Students were compelled to quickly adapt to virtual classrooms using digital platforms such as Zoom, Google Meet, and e-learning systems, often without sufficient preparation or resources (Sukmana et al., 2024; Nurjannah & Himmawan 2024). This situation underscored that technology alone was insufficient to ensure effective learning; students' readiness both technical and psychological emerged as a decisive factor in determining online learning success. As the post-pandemic era unfolds, hybrid and online modes are no longer temporary solutions but have become institutionalized in higher education systems (Afandi et al., 2023).

Students' online learning readiness is a multidimensional concept involving digital literacy, self-regulated learning, access to technology, motivation, and emotional adaptability (Marbun et al., 2024; Takdir et al., 2021). In the Indonesian higher education context, these aspects vary widely due to regional inequalities, socioeconomic diversity, and differing institutional capacities. Understanding these factors is crucial, as students' readiness directly influences their learning outcomes, engagement, and academic achievement in digital environments. Furthermore, examining readiness levels helps policymakers and educators identify gaps in digital equity and infrastructure, which remain persistent challenges across Indonesian regions.

Although previous research has addressed online learning readiness, most studies in Indonesia are limited in scope, often focusing on individual institutions or small samples (Gadeng et al., 2024). As a result, there remains a lack of comprehensive national-level insight into students' readiness across diverse geographical and institutional contexts. This gap is significant because the sustainability of online education depends not only on technological infrastructure but also on the psychological and behavioral readiness of students. Addressing this research gap is therefore crucial to understanding how Indonesian higher education can sustain and improve digital learning in the post-pandemic era.

This study seeks to fill this gap by conducting a bibliometric analysis and systematic review of students' online learning readiness in Indonesian higher education after the COVID-19 pandemic. Through bibliometric mapping, the study identifies publication trends,

dominant themes, and research networks, while the systematic review synthesizes findings across different regions to highlight key factors influencing readiness. This dual approach provides a holistic understanding of students' readiness and offers empirical evidence on how various life, learning, and technological factors interact in shaping digital learning experiences.

The significance of this study lies in its contribution to higher education policy and theoretical development. From a policy perspective, the findings can support universities and policymakers in formulating strategies to enhance students' digital competence, address regional inequalities, and promote inclusive online learning ecosystems. From a theoretical standpoint, this study enriches the conceptual framework of online learning readiness by integrating cognitive, affective, and technological dimensions relevant to post-pandemic education. Ultimately, this research supports Indonesia's broader digital transformation agenda by providing a strong empirical basis for sustainable, equitable, and effective online learning implementation in higher education.

RESEARCH METHOD

This study adopts a systematic literature review method, which involves collecting and synthesizing research findings on specific topics through clear and structured procedures (Rachmawati, 2024). The gathered data is then analyzed to gain insights into students' readiness for online learning in higher education after the COVID-19 era. This method entails selecting an appropriate study design for data collection, analyzing and interpreting the data to write a report, and determining whether to submit the article for publication. The research follows this systematic approach.

1. Search Strategy

The process of finding and selecting scientific articles on students' readiness for online learning in higher education during the post-COVID-19 era in Indonesia involved multiple databases, including Google Scholar (339 articles), Semantic Scholar (6 articles), Crossref metadata (100 articles), and Publish or Perish indexed by Crossref (13 articles). The literature search used the keywords Are students ready? "Students' Online Learning" Readiness in "Higher Education Post-COVID-19 Era": A Case Study in Indonesia.

2. Inclusion and Exclusion Criteria

Eligibility criteria were established to ensure that the analysis results effectively addressed the research questions. The chosen articles were filtered according to specific inclusion and exclusion criteria defined by the authors. For this study, the inclusion criteria required scientific articles to be written in English and published between 2023 and 2024, conducted in Indonesia, using research methods other than systematic reviews, and focusing on the readiness of students in higher education post-COVID-19. Consequently, articles that did not meet these criteria were excluded, such as those written in languages other than English, focusing on the readiness of students in higher education before or during the COVID-19 pandemic, using a systematic review method, or conducted in locations outside of Indonesia.

Table 1. Criteria of Inclusion and Exclusion

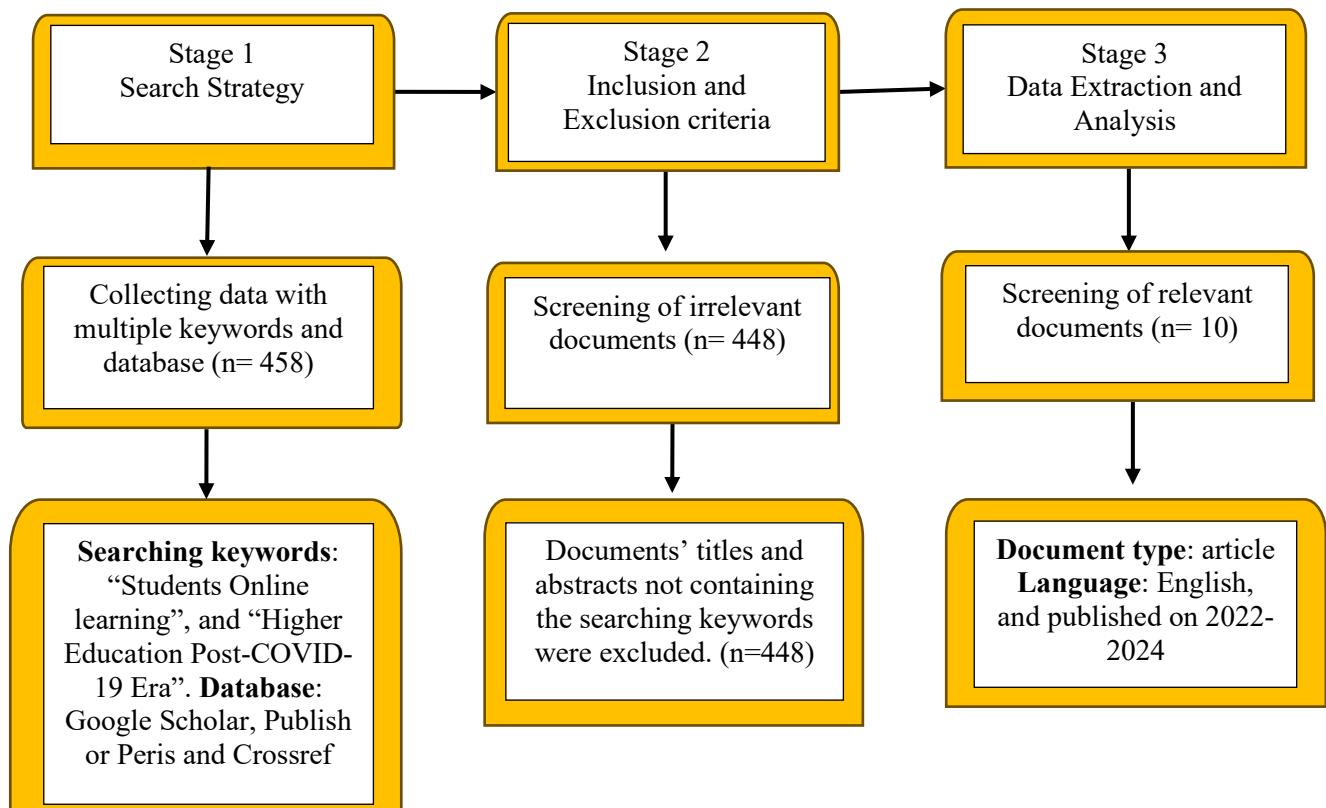
Inclusion criteria	Exclusion criteria
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<ol style="list-style-type: none"> 1. Article written in English 2. Publish in 2023-2024 3. Conducted in Indonesia 4. The research did not use a systematic review method. 	<ol style="list-style-type: none"> 1. Article in languages other than English 2. Publish before 2023 3. Conducted other in Indonesia 4. The research uses a systematic review method.
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3. Data Extraction and Analysis

The data extraction and analysis process was conducted systematically to ensure transparency and rigor in article selection. Initially, 458 articles were identified through database searches using specific keywords across Google Scholar, Publish or Perish, and Crossref. These articles underwent several screening stages, including duplicate removal, title and abstract evaluation, and assessment based on predefined inclusion and exclusion criteria. During this process, 448 articles were excluded for not meeting the eligibility requirements or lacking relevance to the research objectives. Consequently, 10 articles were retained for the final analysis, representing studies that fully met the inclusion criteria in terms of publication type, language, and publication year. The overall screening procedure followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to maintain methodological consistency, as illustrated in the PRISMA flow diagram. Each selected article was then carefully analyzed to extract, organize, and synthesize key findings aligned with the focus of this research.

Figure 1. Systematically review method



Source: Data Processed, (2025).

RESULT AND DISCUSSION

Result

Table 2. Previous Studies

No	Author	Title	Methodology	Result
1	Nur Kholifah ¹ , Muhammad Nurtanto ² , Farid Mutohhari ³ , Urip Wahyuningsih ⁴ , and Sri Listiani ⁵	Students for Practical Learning Readiness in Vocational Education: A post-pandemic Survey	<p>The research method used is a survey design. The researchers adopted a survey approach using a questionnaire to measure Practical Learning Readiness (PLR) in vocational students. In this study, 386 vocational students completed the PLR questionnaire. Of these participants, 181 (46.89%) were male and 173 (44.82%) were female. The students came from four universities in Central Java and Yogyakarta provinces.</p>	<p>Based on the research results, the overall Practical Learning Readiness (PLR) level was measured across three dimensions: supporting knowledge, physical condition, and psychological condition.</p> <ol style="list-style-type: none">1. The physical condition dimension had the highest level, categorized as high (mean = 2.86), indicating that students' physical readiness, including body stamina, was relatively strong.2. The lowest psychological condition dimension was categorized as low (mean = 2.18). Indicators such as emotional resilience, motivation, and learning intention were weak, highlighting significant student psychological readiness issues.3. The supporting knowledge dimension also scored low (mean = 2.47), with notable weaknesses in problem-solving knowledge and understanding of working principles.
2	Cucuk Wawan Budiyanto ¹ , Rizka Latifah ² , Herman Saputro, Adi 3, Prananto ⁴	The Barriers and Readiness to Deal with Digital Transformation in Higher Education	<p>This research employs a qualitative method, with data collected through questionnaires and interviews. The sample comprises students, lecturers, and management staff from engineering education study programs at an</p>	<p>The results of the study indicate the following:</p> <ol style="list-style-type: none">1. Students demonstrated readiness by being open to the new learning system, recognizing the importance of data security, and understanding IT usage and digital platforms.2. Several barriers were identified, including a lack of IT equipment, insufficient digital literacy, passivity, concerns about data loss, and

No	Author	Title	Methodology	Result
			Indonesian institution.	a long adaptation period. Students also reported challenges related to learning flexibility
3	Fadhilah ¹ , Muhammad Husin ² .	Student Readiness on Online Learning in Higher Education: An Empirical Study	<p>This study utilizes a quantitative research approach by applying the Partial Least Squares-Structural Equation Model (PLS-SEM). The sample consisted of 157 students majoring in mining engineering at the Faculty of Engineering, Universitas Negeri Padang. Data was analyzed using Smart PLS, a software for PLS-SEM analysis.</p>	<p>The study found that student readiness for online learning was significantly influenced by three key factors: self-management in learning, lecturer quality, and access to technology. The overall readiness of students was assessed as moderate, with an R-squared value of 0.582, indicating that these three factors explained 58.2% of the variance in student readiness for online learning.</p>
4	Ririn Ovilia ¹ , Syafirti Ramdhani ² , Fitrawati ³	EFL Students' Readiness for Independent Learning Observed from their Self-Regulation in Post-COVID-19 Outbreak	<p>This research uses a quantitative research design. Data were collected using two Likert-scale questionnaires. The study was conducted with 127 students from the English Department at Universitas Negeri Padang, Indonesia.</p>	<p>According to the result of the research, the readiness of students was measured across five key components:</p> <ol style="list-style-type: none"> 1. Metacognitive skills: Students were found to be mostly ready in this area. They were able to plan, set goals, and evaluate their learning process, with most students demonstrating awareness of strategies that work best for them during independent study. 2. Time management: This component scored the lowest. Many students struggled to manage their time effectively for self-study, with a significant portion finding it hard to stick to study schedules. 3. Environmental structuring: This component had the

No	Author	Title	Methodology	Result
5	Purwarno ¹ , Susi Ekalestari ¹ , Andang Suhendi ¹ Alice Shanthi ² , Nur Fadhlina Zainal Abedin ³	Students' Readiness and Perception of the Effectiveness of Online Education Post-COVID-19 Pandemic	This research uses a quantitative cross-sectional study design. Data were collected using a self-administered questionnaire. The study was conducted at Universitas Islam Sumatra Utara, and the total sample was 308 students from different faculties.	<p>highest score. Most students were able to create a conducive learning environment by choosing appropriate places to study and minimizing distractions.</p> <p>4. Persistence: Students showed good persistence, with most of them making efforts to stay focused even when the material was boring or challenging.</p> <p>5. Help-seeking: While students were willing to seek help from classmates, there was some hesitancy in reaching out to instructors, indicating a gap in help-seeking behavior.</p>
6	Dwi Prasetyanto ¹ , Muhammad Rizki ² and Yos Sunitiyoso ³	Online Learning Participation Intention after the COVID-19 Pandemic in Indonesia.	The research was structured around the theoretical framework examining the impact of ICT and online learning. An online questionnaire was distributed to 906 undergraduate students from Bandung, Indonesia,	<p>The results of the study indicate the following:</p> <ol style="list-style-type: none"> 1. According to a one-way ANOVA test, there was no significant difference in readiness for online learning among students from different faculties ($p = 0.533$). 2. The study found that while students appreciated the convenience and flexibility of online learning, they faced challenges related to internet connectivity, lack of motivation, and technical issues.

No	Author	Title	Methodology	Result
			<p>in mid-2021. The study employed Discriminant Analysis (DA) and Multinomial Logistic Regression (MNL) for data analysis.</p>	<p>connectivity issues and distractions at home decrease students' preference for online learning.</p> <p>3. Socioeconomic Factors: Students with higher monthly allowances are more likely to prefer continuing online learning, while those with lower incomes face more difficulties.</p> <p>4. Communication and Focus: Students struggle with communication problems and the ability to focus during online classes, which reduces their willingness to engage in frequent e-learning.</p>
7	Prasetyanto, P ¹ ., Mulyono, E ² ., Yunita, R ³ ., and Nugroho, M. A ⁴ .	Online Learning Participation Intention after the COVID-19 Pandemic in Indonesia: Do Students Still Make Trips for Online Class?	<p>The research does not directly specify the methodology; however, it utilizes Discriminant Analysis (DA) and Multinomial Logistic Regression (MNL) in its analysis. The researchers conducted a survey using an online questionnaire distributed to 906 undergraduate students in Bandung, Indonesia, in mid-2021.</p>	<p>Based on the study, it was found that:</p> <ol style="list-style-type: none"> 1. A significant number of students (48.8%) preferred to conduct online learning from home even after the pandemic. 2. 68.1% of respondents preferred to spend 3–4 days per week on online learning, indicating a preference for a hybrid approach (a mix of online and offline classes). 3. These challenges included internet connectivity, home environment distractions, and communication issues with peers or instructors. Despite these obstacles, most students were willing to continue online learning to some extent, with many favoring a blended learning model (both online and offline learning).

No	Author	Title	Methodology	Result
8	Hasan Djidu ¹ , Sufri Mashuri ¹ , Nasruddin ¹ , Andri Estining Sejati ² , Rasmuin ² , La Eru Ugi ³ , Afudin La Arua ³	Online Learning in the Post-COVID-19 Pandemic Era: Is Our Higher Education Ready for It?	The study utilized a qualitative phenomenological approach. Data was obtained through online questionnaires and in-depth interviews involving 408 students and 20 lecturers from 12 universities (6 public and 6 private) across various regions, including Java, Sumatra, Kalimantan, Sulawesi, Nusa Tenggara, and Maluku.	<p>Based on the study, it was found that the implementation of online learning has challenges, such as:</p> <ol style="list-style-type: none"> 1. Limited resources, students from low-income families struggled with access to electronic devices, internet connectivity, and electricity. Besides that, many students in remote areas experienced difficulties in accessing reliable internet, often having to travel to higher altitudes or specific locations to get a signal. 2. Lack of skill and knowledge, many students and lecturers lacked the necessary skills to effectively use online learning platforms. 3. Time management, students reported difficulties managing their time due to a significant increase in assignments and overlapping schedules for online classes. 4. Learning environment, the home environment often lacked the structure or facilities conducive to effective online learning.
9	Yufrinalis, M ¹ , Tiring, S. S. N. D ² .	Online Learning Participation after the COVID-19 Pandemic in Sikka Regency, Eastern Indonesia.	The research employed a qualitative descriptive approach. Data were collected through interviews, observations, and documentation studies conducted at six high schools in Maumere, Sikka Regency, from August to December 2020. Respondents	<p>Based on the study, it was found that several challenges to the implementation of online learning such as:</p> <ol style="list-style-type: none"> 1. Student challenges, many students had low participation in online learning due to several factors such as a lack of devices, limited internet access, and a student mindset. 2. Challenges for teachers: Teachers face challenges in delivering lessons due to the

No	Author	Title	Methodology	Result
			included principals, students, teachers, parents, and the head of the Sikka District Education Office.	low engagement of students and issues like poor internet connectivity. 3. Economic challenges, many students came from low-income families who struggled to provide the necessary tools for online learning. 4. Digital literacy, both students and teachers lacked the skills needed to effectively use online learning platforms. 5. Motivation readiness, the mental readiness of students was low, as many were not fully committed to engaging with online learning platforms.
10	Erianjoni ¹ , Deski Beri ² , Okriyeni Sudiar ³ , Kasmita ⁴ , Anton Komaini ⁵ , Ganefri ⁶ Aprizon putra ⁷ , Helpi Nelwatri ⁸ , Alfajri Yusra ⁹ , Titen Darlis Santi ¹⁰	Online Learning Process During the New Normal Post-COVID-19 in Indonesia: A Case Study at the Universitas Negeri Padang	The study used a descriptive quantitative approach to evaluate the effectiveness of online learning in the post-COVID-19 new normal period. The research focused on undergraduate students from Universitas Negeri Padang (UNP), with samples selected from three faculties: Language and Arts, Social Sciences, and Mathematics and Natural Sciences.	Based on the study, it was found that: 1. The results indicated that online learning at UNP was highly effective. This was attributed to the fact that both students and lecturers had prior experience with online learning platforms like Moodle, WhatsApp Group (WAG), and Zoom, which had been in use since 2013. 2. Student attendance during online learning was high, with attendance rates ranging from 81% to 96% across different programs and years. 3. The availability of lesson plans and the use of IT platforms (Moodle, WAG, and Zoom) were also highly consistent, showing an average of 91-94% readiness in terms of lesson plan dissemination and attendance.

Source: Data Processed (2025)

1. Co-Occurrence Network

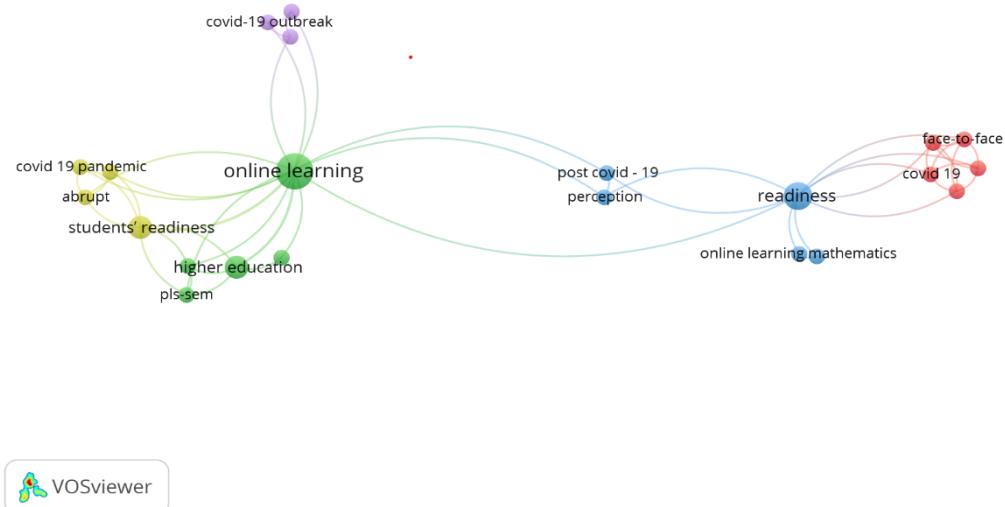


Figure 1. VOSviewer

Source: Data Processed (2025)

This study adopted a software tool, VOS Viewer, to construct and visualize data. Figure 1 shows five color clusters: green, yellow, red, blue, and Purple. The green color indicates online learning, higher education, and leisure activities. The yellow color represents student readiness and the COVID-19 pandemic. Blue reflects perspectives, post-COVID-19, student readiness, and online mathematics learning. The purple color signifies the COVID-19 outbreak, while the red color represents face-to-face learning and COVID-19.

2. Thematic Analysis.

Based on an analysis of 10 related articles, the author categorizes the key points from the findings of these articles as follows.

a) The low technical readiness of students.

Based on the analysis of the 10 articles, three of them highlight challenges related to students' technical readiness, such as limited access to digital devices, low digital literacy, and poor internet connectivity. These factors significantly impact students' preparedness for online learning. In certain areas, particularly in Eastern Indonesia, these issues have led students to prefer implementing offline learning after the COVID-19 pandemic.

b) Students' readiness for online learning.

Based on the analysis of the 10 related articles, two of them explain that students' readiness for learning is influenced by several important factors, including self-management, access to technology, time management, and metacognitive skills. On average, students with good time management, self-management, and persistence in independent learning show higher readiness compared to students who struggle with time management, lack focus in self-directed learning, and have poor self-management. This was proven through an experiment where the influence of these factors showed a coefficient of 0.233.

c) The low psychological readiness of students.

Based on the analysis of the 10 articles, two articles explain that students' psychological readiness to engage in online learning after COVID-19 is very low. Several aspects,

such as emotional resilience and low motivation to learn, indicate that students' psychological preparedness for online learning is lacking. Furthermore, students' mental readiness and commitment to participate in the online learning process are also generally low.

d) Learning motivation.

Based on the analysis of the 10 related articles, two articles highlight that learning motivation is a significant challenge in online education. The research indicates that students often struggle to maintain their learning enthusiasm due to technical issues and connectivity problems. However, not all areas show the same pattern. For instance, at Padang State University, students exhibit high learning motivation, likely due to prior experience with using digital platforms in education.

e) Socio-economic factors.

Based on the analysis of 10 related articles, two journals explain that socio-economic factors have a significant impact on readiness for online learning in the post-COVID-19 era. Students from lower economic backgrounds face more complex challenges, such as difficulties in accessing networks or smartphones, which are crucial for facilitating online learning in the post-COVID-19 era. This factor significantly affects students, especially those from Eastern Indonesia, who tend to have lower economic levels Discussion

The Discussion section is intended to interpret and analyze the significance of the research findings, not merely repeat the results that have been presented. Authors should avoid restating data or including overly broad theoretical citations that are not directly relevant. Instead, the discussion should focus on connecting the results to the research objectives, examining how the findings support, differ from, or add to existing theories and previous studies. Authors are encouraged to explain the implications of the findings in both theoretical and practical contexts, highlight the strengths and limitations of the study, and offer thoughtful interpretations supported by evidence.

The discussion should include comparisons with previous research and be supported by references to relevant literature, without being overly descriptive or generalized. It is essential that the analysis remains critical, focused, and structured, highlighting the novelty and contribution of the current research.

All parts of the article should be written using Times New Roman font, size 12 pt, 1.15 line spacing, and justified alignment, with a first-line paragraph indentation of 1 cm. Section headings such as introduction, research method, results and discussion, conclusion, and references must be written in UPPERCASE, bold, and Times New Roman 12 pt. The manuscript should use A4 paper size (21 × 29,7 cm), with margins set to: Top 2.5 cm, Bottom 2.5 cm, Left 2.5 cm, and Right 2.5 cm, in accordance with JEDMI's formatting guidelines. The manuscript length is targeted at 5,000 to 8,000 words, including tables, figures, and references.

Discussion

The findings from the ten reviewed studies reveal that students' readiness for online learning in Indonesia remains uneven and influenced by multidimensional factors encompassing technical, psychological, and socio-economic aspects. Several studies indicate that technical readiness plays a central role in determining students' adaptability to online

learning environments. Kholifah et al. (2023) found that while students demonstrated strong physical readiness, their technical and psychological readiness remained low, especially in maintaining motivation and emotional stability. Similarly, Djidu et al. (2022) emphasized that limited access to digital devices and unstable internet connectivity directly affected students' participation and engagement in online learning. This aligns with the concept of technological readiness theory, which suggests that individuals' confidence and control over technology influence their learning outcomes. In regions such as Eastern Indonesia, these infrastructural constraints are more pronounced, as also highlighted by Yufrinalis & Tiring (2021), who observed that students' low participation rates were largely due to poor internet access and insufficient digital literacy. In contrast, universities in Java, such as Padang State University and Bandung-based institutions, as shown in studies by Fadhilah & Husin (2022); Prasetyanto et al. (2023), recorded higher readiness levels due to better digital facilities and prior exposure to e-learning platforms.

Beyond technical capacity, psychological and metacognitive readiness emerged as equally decisive factors. Ovilia et al. (2023); Purwarno et al. (2022) found that self-management, persistence, and motivation were crucial determinants of readiness, echoing the self-regulated learning theory that emphasizes learners' autonomy in organizing cognitive and emotional resources. Students with strong self-management skills exhibited higher readiness, as evidenced by Fadhilah & Husin's (2022) quantitative findings, which recorded a significant positive coefficient ($\beta = 0.233$) between these variables. Conversely, weak psychological resilience, as described by Kholifah et al. (2023), often resulted in decreased motivation, poor time management, and lower engagement. These findings suggest a causal linkage where psychological readiness mediates the effect of technical and environmental factors on students' online learning outcomes. Furthermore, socio-economic disparities reinforce these differences. Prasetyanto et al. (2022) demonstrated that students from higher-income families were more prepared for online learning, given their access to better internet and devices. Meanwhile, students from low-income or rural backgrounds, particularly in Eastern Indonesia, faced compounded disadvantages that limited their digital participation (Yufrinalis & Tiring, 2021).

Drawing from these interrelated findings, it can be interpreted that Indonesia's post-pandemic higher education system is still transitioning toward adaptive digitalization, where readiness is not merely a product of technological access but an interplay between infrastructure, psychology, and socio-economic conditions. According to the adaptive learning policy framework, higher education institutions must design interventions that strengthen digital literacy, provide psychological support systems, and ensure equitable access to technological resources across regions. However, as the reviewed studies primarily focus on descriptive analyses without testing causal mechanisms, further research should advance toward thematic synthesis or meta-analytic models to identify direct and indirect relationships among these factors. Future studies should also integrate theoretical lenses such as constructivism or technological acceptance models to contextualize how readiness evolves alongside pedagogical adaptation. From a policy perspective, these insights imply that universities, particularly in less developed regions, must adopt targeted adaptive policies—for instance, subsidizing internet data, developing hybrid learning ecosystems, and implementing

mentoring programs that enhance self-regulated learning. By doing so, higher education in Indonesia can move from reactive online adaptation toward a sustainable and equitable digital transformation

CONCLUSION

Based on the analysis of the 10 related articles, several key factors have been identified that influence students' readiness for online learning in the post-COVID-19 era. First, technical readiness remains a major barrier for many students, particularly in areas with limited access to digital devices and poor internet connectivity. This issue is especially prevalent in eastern Indonesia, where students prefer offline learning due to these technical constraints. Second, students' readiness for online learning is also influenced by self-management, time management, and metacognitive skills, with those demonstrating strong independent learning abilities showing higher levels of readiness. Third, psychological readiness plays a crucial role, as many students struggle with emotional resilience and motivation, which are essential for successful online learning. Moreover, socio-economic factors significantly affect students' access to necessary resources for online learning, with students from lower economic backgrounds facing more complex challenges, particularly in accessing networks and smartphones. These findings emphasize the need for targeted interventions to improve both the technical and psychological readiness of students, as well as addressing socio-economic disparities to ensure equitable access to online learning opportunities.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

ETHICS STATEMENT

This article is an original work and has not been previously published, nor is it under review by another journal. The manuscript is free from plagiarism, and all authors have read and approved the final version for submission to this journal.

DECLARATION OF GENERATIVE AI

No generative AI or AI-assisted technologies were used in the writing of this manuscript.

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