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STUDENTS' DEPENDENCY ON ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: A SYSTEMATIC LITERATURE REVIEW

Yulia Regi Magdalena, Yendra Yendra, Melvina Melvina
Universitas PGRI Sumatera Barat, Padang, Indonesia
yuliaregim@gmail.com

ABSTRACT

The rapid development of artificial intelligence (AI) has significantly transformed higher education, particularly in supporting learning processes and academic tasks. However, alongside its benefits, concerns have emerged regarding students' increasing dependency on AI technologies. This study aims to analyze the use of AI in higher education and examine the extent and implications of student dependency on AI. Employing a Systematic Literature Review (SLR) design, this research synthesizes findings from 23 peer-reviewed international journal articles published between 2019 and 2024. Data were collected from major academic databases and analyzed using a thematic analysis approach to identify key patterns related to AI usage and dependency in learning contexts. The findings reveal that AI provides substantial advantages, including enhanced learning efficiency, improved access to academic resources, and support in understanding complex concepts. However, the study also identifies a growing trend of students relying on AI as a primary tool for completing academic tasks, which may reduce critical thinking, academic independence, and engagement in deeper learning processes. Furthermore, issues related to academic integrity and assessment authenticity have become increasingly prominent. This study contributes to the literature by offering a comprehensive synthesis of both the benefits and risks of AI integration in higher education, emphasizing the need for balanced use. It suggests that clear academic policies and ethical guidelines are essential to ensure that AI functions as a supportive learning tool rather than a substitute for students' intellectual development.

Keywords: artificial intelligence; higher education; student dependency; learning process; systematic literature review

1. INTRODUCTION

The development of digital technology over the past few decades has brought about significant changes in various aspects of life, including in the world of higher education. One of the most influential technological innovations today is Artificial Intelligence (AI). The development of AI has driven transformation in educational systems, particularly in supporting technology-based learning processes and educational data analysis (Baker & Smith, 2019; Chen & Chen, 2020; Holmes et al.,

2022; Zawacki-Richter et al., 2019). In the context of higher education, various AI-based applications such as adaptive learning systems, educational chatbots, and generative AI have been used by students to help complete various academic tasks. This technology enables students to access information more quickly and helps explain complex learning concepts in a simpler manner (Crawford et al., 2023; Dwivedi et al., 2023; Kasneci et al., 2023; Luckin et al., 2016; Tlili et al., 2023). Several studies indicate that the use of AI in education can enhance learning efficiency and help students access a broader range of academic information sources (Chassignol et al., 2018; Holmes et al., 2019; Ouyang & Jiao, 2021; Pedro et al., 2019; Roll & Ford, 2016). Additionally, AI technology can function as a learning assistant that provides automatic feedback on student assignments, thereby helping to improve the quality of learning (Chen & Chen, 2020; Holmes et al., 2022; Luckin et al., 2016).

However, the emergence of AI technology has also raised various issues in the field of education. One issue that has been widely discussed is the increasing reliance of students on AI technology to complete academic assignments (Baidoo-anu & Ansah, 2023; Cotton et al., 2024; Rudolph et al., 2023). n some cases, students use AI not only as a tool but also as the primary source for generating academic texts (Crawford et al., 2023; Dwivedi et al., 2023). This situation raises concerns that excessive use of AI may compromise academic integrity and reduce students' engagement in critical thinking and academic reflection. A number of studies also highlight the potential emergence of new issues such as plagiarism, difficulties in assessing the authenticity of student work, and challenges in the learning evaluation process in the era of generative AI (Bearman & Ajjawi, 2023; Perkins, 2023; Susnjak et al., 2022).

Nevertheless, most previous research has focused more on the potential and benefits of AI in supporting the learning process in higher education. These studies generally highlight how AI can enhance learning effectiveness, personalize learning materials, and improve efficiency in accessing academic information (Chen & Chen, 2020; Holmes et al., 2022; Ouyang & Jiao, 2021; Pedro et al., 2019). Meanwhile, studies specifically examining the extent of students' reliance on AI and its implications for the learning process in higher education remain relatively limited. Furthermore, existing research findings also reveal diverse perspectives on the impact of AI use on students' learning processes, necessitating a more comprehensive study to understand this phenomenon more systematically.

Given these circumstances, there is a research gap in the literature regarding how the use of AI by students in higher education may potentially lead to dependence on this technology in the learning process. Therefore, a study is needed that can integrate various findings from previous research to provide a more comprehensive picture of the relationship between AI use and student dependence in the context of higher education. Based on the background above, this study aims to analyze the use of

Artificial Intelligence in higher education and examine the level of student dependence on AI technology based on findings from various previous studies. This study was conducted using a Systematic Literature Review (SLR) approach on international journal articles discussing the use of AI in higher education.

2. METHODOLOGY

This study employs a Systematic Literature Review (SLR) approach to identify, evaluate, and synthesize various prior studies related to the use of Artificial Intelligence in higher education and its potential impact on student dependency. The SLR method is widely used in educational research to provide a comprehensive and systematic understanding of research developments in a specific field (Kitchenham, 2007; Snyder, 2019; Xiao & Watson, 2019). Through this approach, various relevant studies can be systematically analyzed to identify research trends, key findings, and research gaps in the existing literature. The data collection process involved searching for scientific articles in several international academic databases, namely Scopus, ScienceDirect, Springer, Taylor & Francis, and Google Scholar. These databases were selected to ensure that the analyzed articles possess high academic quality and have undergone a peer-review process (Snyder, 2019; Tranfield et al., 2003). he article search process utilized several keywords related to the research topic, such as Artificial Intelligence in Higher Education, AI in Learning, Student Dependency on AI, Generative AI in Education, and AI in Education. These keywords were used to identify studies that specifically addressed the use of AI technology in the context of higher education (Holmes et al., 2022; Kasneci et al., 2023; Zawacki-Richter et al., 2019).

To ensure the relevance and quality of the articles analyzed, this study applied several inclusion and exclusion criteria. The inclusion criteria include: (1) articles published in international journals that have undergone a peer-review process, (2) articles written in English, (3) studies discussing the use of Artificial Intelligence in education or higher education, and (4) articles published between 2019 and 2024 to reflect the latest developments in AI technology in education. Meanwhile, the exclusion criteria include: (1) conference abstracts, editorial articles, or opinion pieces lacking clear empirical or theoretical discussion, (2) articles that do not specifically address the use of AI in an educational context, and (3) duplicate articles found across multiple databases. The article selection process was conducted systematically by adapting the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. In the initial stage, the search process yielded 50 relevant articles from the various databases used. After removing duplicate articles, 35 articles remained. The next stage involved screening titles and abstracts to assess the articles' relevance to the research topic, resulting in 28 articles that met the initial criteria. Subsequently, a full-text review was conducted to evaluate the articles' alignment with

the research objectives. Based on this process, 23 international journal articles were selected for the final analysis of this study.

The selected articles were then analyzed using a thematic analysis approach to synthesize findings from previous research. This analysis focuses on identifying several key themes related to the use of Artificial Intelligence in higher education, specifically regarding the benefits of AI in learning, the potential risks of student dependence on AI technology, and the educational implications of integrating AI into the learning process at universities (Dwivedi et al., 2023; Ouyang & Jiao, 2021; Tlili et al., 2023). Through this analytical process, this study aims to provide a more comprehensive overview of how AI technology is utilized in higher education and how it may potentially influence students' learning behaviors and levels of dependence on technology.

3. RESULTS

A. Summary of Selected Studies

Based on the systematic literature review process, a total of 23 international journal articles were selected for the final analysis. These studies discuss various aspects of Artificial Intelligence in higher education, including the benefits of AI in supporting learning activities, the increasing use of generative AI tools by students, and the potential risks associated with student dependency on AI technologies. The selected studies were analyzed and synthesized to identify key themes and research trends related to the use of AI in higher education. The summary of the selected studies is presented in Table 1.

Table 1. Summary of Selected Articles

Author	Year	Focus of Study	Key Findings
Baker & Smith	2019	AI in education	AI supports personalized learning and digital transformation in education
Zawacki-Richter et al.	2019	AI in higher education	AI research in higher education is growing but still limited in pedagogical applications
Holmes et al.	2019	AI and learning systems	AI enables adaptive learning environments
Pedro et al.	2019	AI and sustainable education	AI can improve access and quality of education
Roll & Ford	2016	AI in learning	Intelligent tutoring

		systems	systems support student learning
Luckin et al.	2016	AI as learning assistant	AI can support students' learning processes
Chen & Chen	2020	AI in education review	AI improves efficiency and personalization of learning
Ouyang & Jiao	2021	AI learning paradigms	AI supports student-centered learning
Chassignol et al.	2018	AI trends in education	AI promotes innovation in educational technologies
Dwivedi et al.	2023	Generative AI impacts	AI offers opportunities but also ethical challenges
Crawford et al.	2023	ChatGPT in education	Generative AI supports academic tasks but raises ethical concerns
Kasneci et al.	2023	LLMs in education	Large language models have strong potential in education
Tlili et al.	2023	ChatGPT case study	AI can support learning but must be used responsibly
Baidoo-Anu & Ansah	2023	ChatGPT for learning	AI enhances learning support and access to information
Cotton et al.	2024	Academic integrity	AI raises concerns about cheating and plagiarism
Rudolph et al.	2023	AI applications in HE	AI increasingly used by students
Perkins	2023	Academic integrity	AI challenges traditional assessment systems
Susnjak	2022	AI and online exams	AI threatens integrity of online assessments
Bearman & Ajjawi	2023	Pedagogy in AI era	Teaching approaches must adapt to AI technologies
Snyder	2019	Literature review methods	SLR enables systematic synthesis of research
Kitchenham	2007	SLR methodology	Provides structured guidelines for literature

			reviews
Xiao & Watson	2019	SLR guidance	Systematic selection improves research reliability
Tranfield et al.	2003	Evidence-based review	SLR supports knowledge integration

4. DISCUSSION

A. Artificial Intelligence in Higher Education

Based on an analysis of 23 international journal articles discussing the use of Artificial Intelligence in higher education, most studies indicate that AI has great potential to support the student learning process. This technology enables the development of learning systems that are more adaptive, interactive, and capable of tailoring learning materials to individual student needs (Chen & Chen, 2020; Holmes et al., 2022; Zawacki-Richter et al., 2019). Several studies indicate that AI can function as a learning assistant that helps students understand complex concepts through simpler and more accessible explanations (Kasneci et al., 2023; Luckin et al., 2016). AI-based systems can also provide automatic feedback on student assignments, thereby helping to enhance the effectiveness of the learning process (Holmes et al., 2019; Roll & Ford, 2016). Additionally, AI technology makes it easier for students to access academic information and search for scientific literature relevant to their learning topics. This makes the reference search process faster and more efficient compared to conventional methods (Chassignol et al., 2018; Ouyang & Jiao, 2021; Pedro et al., 2019). In several recent studies, generative AI technology has also been used to help students summarize scientific texts, draft writing outlines, and explain various academic concepts more systematically (Crawford et al., 2023; Dwivedi et al., 2023; Kasneci et al., 2023). A synthesis of these various studies indicates that AI can provide numerous benefits in students' academic activities, such as enhancing learning efficiency, accelerating access to information, and helping students understand complex material (Chen & Chen, 2020; Holmes et al., 2022; Tlili et al., 2023). Nevertheless, several studies also emphasize that the use of AI must be approached wisely to avoid replacing students' roles in the process of critical thinking and academic analysis. AI technology should be positioned as a tool that supports the learning process, not as a substitute for students' intellectual abilities (Bearman & Ajjawi, 2023; Perkins, 2023; Susnjak et al., 2022).

B. Students' Level of Dependence on Artificial Intelligence

An analysis of 23 articles also indicates a growing trend of students relying on AI technology to complete various academic tasks. Several studies have found that students use AI to assist with writing essays, summarizing scientific articles, and searching for research references (Baidoo-anu & Ansah, 2023; Cotton et al., 2024). In some cases, students even use AI as their primary source when preparing academic assignments. This situation raises concerns that students may become overly reliant on technology, thereby reducing their engagement in independent thinking processes (Dwivedi et al., 2023; Rudolph et al., 2023). Additionally, some studies highlight the potential impact of AI use on students' critical thinking skills. When students rely too heavily on AI to obtain instant answers, the process of deep reflection and analysis of a problem may diminish (Perkins, 2023; Tlili et al., 2023). However, most studies also indicate that the use of AI does not always have a negative impact on the learning process. When used appropriately, this technology can actually help students better understand learning concepts and improve the quality of their academic writing (Chen & Chen, 2020; Holmes et al., 2022; Ouyang & Jiao, 2021). Therefore, many researchers recommend that the use of AI in higher education be accompanied by clear ethical guidelines and academic policies. This aims to ensure that AI is used as a learning tool that supports students' thinking processes, rather than as a technology that replaces their academic abilities (Bearman & Ajjawi, 2023; Susnjak et al., 2022).

5. CONCLUSION

Based on the results of a systematic literature review of 23 international journal articles, it can be concluded that artificial intelligence plays an increasingly important role in supporting the learning process in higher education. This technology offers various benefits to students, such as improving learning efficiency, facilitating access to academic information sources, and helping students understand complex learning materials. However, the findings also indicate a growing trend of student dependence on AI technology to complete academic assignments. Excessive use of AI has the potential to reduce students' critical thinking skills and independence in the learning process. Therefore, the use of AI in higher education needs to be balanced with clear academic policies and ethical guidelines governing the use of this technology in learning activities. With the right approach, AI can be utilized as an effective learning aid without diminishing students' active role in thinking and learning independently.

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