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The Importance of Literacy on Artificial Intelligence for the Higher Education Students: A Systematic Literature Review

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ABSTRACT

The rapid development of AI technology makes AI literacy crucial in providing individuals with an understanding of the essential functions of AI and its ethical application in higher education. This study used a scoping literature review method by searching the Scopus, Web of Science, Science Direct, and Sage Journals databases. Based on the search results, the eligibility criteria data were analyzed. Authors found as many as 153 pieces of literature, and eleven were declared to meet the eligibility criteria for the literature reviewed in this study. This study shows that AI Literacy is essential in higher education. Educators and higher education institutions are responsible for providing programs that support the development of AI literacy skills in students. The application of AI literacy for students in higher education is essential in dealing with the development of AI technology. However, the lack of studies that address the evaluation of the importance of AI literacy and its implications limits the in-depth understanding of this topic.

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1. INTRODUCTION

Artificial Intelligence (AI) has developed progressively. AI has transformed into an intelligent machine that helps various human activities, especially in industrial activities like business, art, science, and education. This is evidenced by various kinds of AI applications in our daily lives, such as Google, Siri, and smartphone applications [1]. The presence of AI in people's lives also affects various work processes. In the context of higher education, AI has the potential to influence the teaching and learning process, student experience, and educational outcomes. Hornberger et al. (2023) stated that almost all students in all disciplines utilize AI. The presence of AI in students' academic lives is influenced by opportunities for interaction with AI, one of which is the COVID-19 pandemic, which has accelerated the introduction of online technology in teaching in higher education, these technological advances have succeeded in opening up many opportunities in academics [2]–[4].

Escotet (2023) argues that the current trend in higher education is toward more accessible and on-demand education [5]. This is in line with how AI offers new changes in the education sector to find modern education that is more interactive and effective. However, the use of AI,

which now goes hand in hand with academic activities, especially in higher education, raises other issues. Most people recognize the existence of AI but need to learn about the concepts and technology behind it, including ethics [6]. Therefore, proper reading analysis skills are needed to use AI with significant benefits. AI literacy has emerged as a new skill everyone must learn in response to this AI era [7]. Given that AI will improve human life in almost all fields, it is necessary to educate people and even students to understand AI so that they can use AI in an appropriate, responsible, and ethical way [8].

Initially, literacy referred to the ability to express oneself and communicate using written language. Today, literacy is used to define abilities in a variety of areas that have the potential to support communication, expression, and access to knowledge, for example, digital literacy, data literacy, computational literacy, scientific literacy, and so on [9]. Finally, in the face of the significant growth of artificial intelligence (AI), AI literacy is beginning to be defined as a 'literacy' term in the same way it has been applied to define expertise in various disciplines.

In response to the massive development of AI technology today, there is a need to equip human resources with the essential functions of AI and its ethical use in everyday life, namely through AI literacy. Kandlhofer et al. (2019) introduced AI literacy as an in-depth understanding of AI concepts and practices that ultimately enable people to make the right decisions regarding AI [10]. In addition to conceptual and practical knowledge, AI literacy is another competency that enables individuals to critically evaluate AI technologies, communicate and collaborate effectively with AI, and utilize AI as a resource in various situations and aspects of life [9]. Artificial intelligence (AI) learning and literacy development should be the main focus of learning, including in higher education. Students are an essential target for AI learning as they must develop the skills necessary to manage and utilize AI in their careers effectively [11]. Students who have gained a solid fundamental understanding of AI can develop the field further by designing projects and research, applying their skills and knowledge to solve various problems, and facing future academic and career challenges [7].

Research Motivation and Aim

The massive use of AI in various fields of life makes AI literacy necessary for all levels of society who interact directly with technology daily to respond to AI applications critically. In Higher Education, the use of AI has increased in the last five years, along with the emergence of various new AI tools [12]. In Indonesia itself, the use of AI among students is very much. We often encounter some students in real life saying that using AI helps them in doing assignments and exams. They say they can understand a topic but need help understanding it using AI. However, we also often encounter complaints from teachers who convey that the use of AI among students makes them underestimate the assignments given by directly collecting AI answers without re-understanding and answering the results of their understanding. From this fact, it is necessary to promote AI literacy in the university environment, especially for those who are still students, because they will face AI applications in academic, daily life, and professional life. This AI literacy will help them adapt to the rapid information while remaining critical.

Another fact is that the empirical literature on AI literacy is still relatively small; however, a positive trend in publishing articles in this field is emerging, and many researchers are interested in researching AI literacy [13]. We also tried to see the frequency of literature publications on Google Scholar with the keywords "AI Literacy" AND "Higher Education" in the last four years.

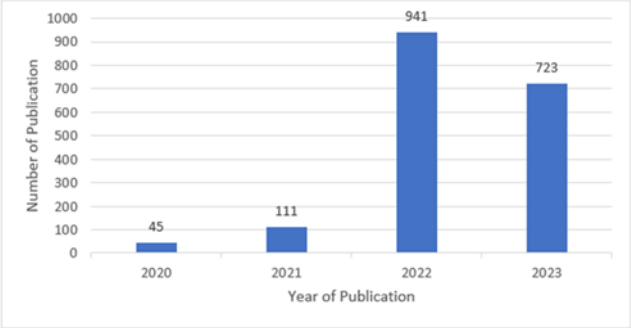

Figure 1 Illustrates the frequency of results on Google Scholar using the search terms 'AI Literacy' OR 'Artificial Intelligence Literacy' AND 'Higher Education' since 2020. The results show a significant increase in publications on AI Literacy in higher education, particularly in 2022 with 941 results. This suggests growing academic recognition of AI-related competencies as essential skills in the digital era. While 2023 saw a slight decline to 723 publications, the overall upward trend highlights the continued relevance of AI literacy in educational research and practice.

The data was taken in December 2023; the literature on AI Literacy in Higher Education has begun to be widely researched and published. However, the discussion of AI literacy is diverse and taken from various focuses. We will collect relevant articles from this data to explore the importance of AI literacy in Higher Education. This research will examine the concept of AI literacy and evaluate the condition of AI literacy in Higher Education so that it can become one of the references in the massive application of AI appropriately and ethically.

Research Question

Based on our introduction, we formulated several questions that will be answered regarding AI literacy in Higher Education. The first step is to determine the extent of understanding regarding the urgency of implementing AI literacy in the Higher Education environment to analyze the benefits and impacts of using AI in the learning and teaching process.

Research Question 1: How important is AI literacy in higher education?

After recognizing the importance of AI literacy in higher education today, the role of educators and institutions in encouraging the understanding and application of AI literacy among students will be discussed.

Research Question 2: What is the role of educators and institutions in fostering AI literacy among higher education students?

Next, we formulated questions about the challenges and barriers to implementing AI literacy among higher education students. By understanding these challenges and barriers, concrete steps and solutions can be formulated to improve the effectiveness of AI literacy learning and teaching in Higher Education.

Research Question 3: What challenges and barriers do higher education face in developing AI literacy skills?

The formulation of this problem will provide in-depth insights into AI literacy in Higher Education in terms of evaluating the urgency to direct the use of AI tools effectively, ethically, and adaptively in the era of AI technology development.

2. RESEARCH METHOD

The research method we used was scoping literature review, which is one of the designs of the literature review method. Scoping literature review is a research method in the form of a systematic review that aims to identify existing evidence in the form of previous research according to the topic discussed, map critical concepts, and report results by the research questions that have been formulated [14]. We chose this method due to the need for more AI literature, so the literature review cannot be done with a systematic literature review or meta-analysis that requires a relatively large number of publications.

Eligibility criteria

In determining the eligibility of the literature, we formulated some exclusion criteria that we used to screen the titles and abstracts and the full text of the literature. We excluded literature focusing on other types of literacy, i.e., mt literacy and data literacy. We also excluded literature that mentioned AI literacy but had a focus beyond that. Furthermore, we also intentionally excluded studies published before 2019. This decision was made to focus on the most recent research, which reflects the latest advancements and developments in the field of AI literacy. Studies from 2019 onward primarily discuss the evolution and practical applications of AI literacy, which are built upon the foundational theories established in earlier research. The authors acknowledge that although foundational concepts were established in research before 2019, focusing on more recent studies offers a better understanding of current trends and innovations, without disregarding the theoretical foundations that have already been established.

Table 1 Exclusion Criteria

Criteria	Explanation
Other forms/types of literacy	Studies that discuss/focus on literacy beyond AI literacy
Does not further discuss AI literacy and its urgency	Studies that mentions AI literacy, but does not discuss it further.
Does not focus on discussing AI literacy in higher education.	Studies that focus on discussing AI literacy outside of the higher education context
Study under 2019	Studies published before 2019

Search strategy

We searched the scientific literature in the research databases Scopus, WebofScience, Science Direct, and Sage Journals. In conducting the literature search, we exclusively focused on literature containing the terms "AI Literacy," "Artificial Intelligence Literacy," and "Higher Education" in the title, abstract, and keywords. We conducted the initial search on December 4, 2023, generating 153 pieces of literature. Given the research topic's novelty and the study's narrow focus, we included all types of literature from the search, including articles, reviews, and conference papers.

Review Strategy

The literature review process was divided into two stages. In the first stage, the authors downloaded all the searched literature and assessed the titles and abstracts based on the exclusion criteria. In the second stage, after the titles and abstracts went through the review process, the literature that met the eligibility criteria went through the whole review process. The authors read

the entire text and assessed the literature according to the exclusion criteria. Literature that met the eligibility criteria was then reviewed in more depth to ensure that the authors comprehensively understood the content of the literature.

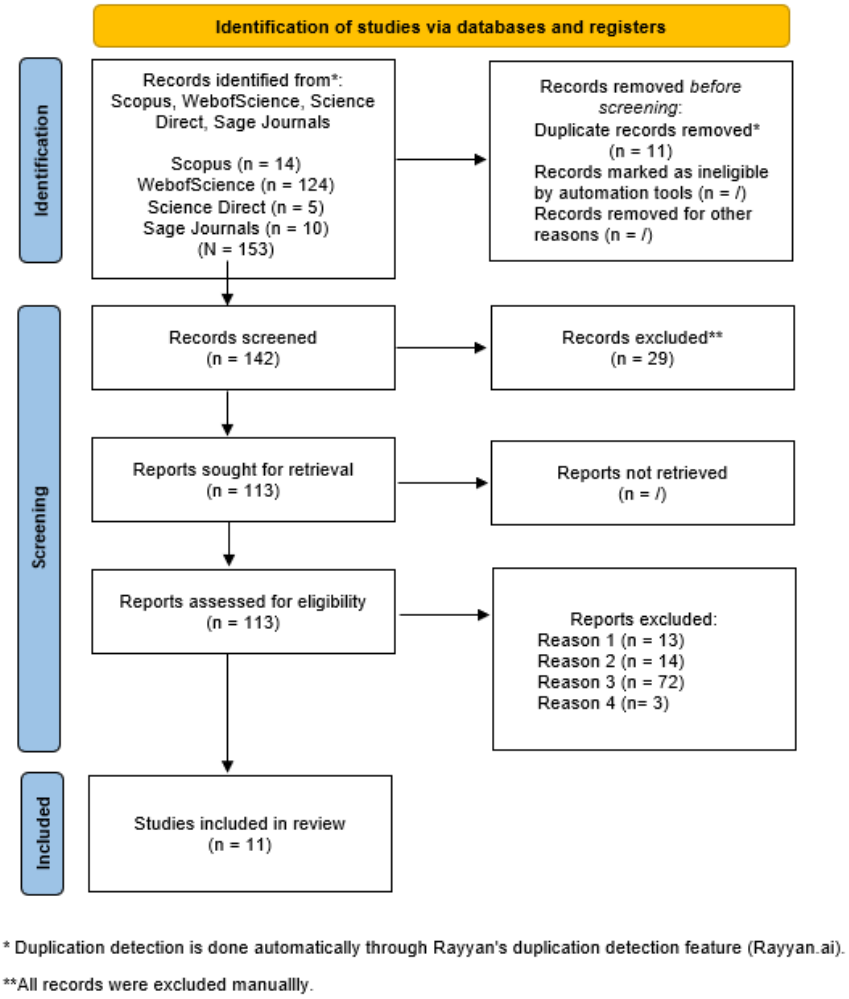

Figure 2 PRISMA Diagram of the review result. Note: This figure is adapted from Page et al. (2021)

3. RESULTS AND DISCUSSION

3.1 RESULT

Selection of Source of Evidence

As presented in Figure 2, the search on multiple databases resulted in 153 kinds of literature. Of the total literature retrieved, Rayyan.ai automatically detected 11 duplicate works. After removing duplicates, 142 records were examined, and 29 did not meet the inclusion criteria due to the authors' limited access to the literature. Subsequently, 113 literature titles were selected and screened based on the predefined exclusion criteria. As a result, after reviewing 113 literature titles, 11 met the inclusion criteria and were selected for review in this study.

Based on the literature review results, a table was developed to extract relevant content from each study. The table presents bibliographic information (i.e., title, author, year of publication), a summary of the study, statements or assertions about the importance of AI literacy in higher education, and the focus/target audience of the study.

Table 2 Characteristics of studies included in the review, including short summaries; questions, statements, and arguments about AI literacy in Higher Education

#	Title	First Author	Year of Publication	Short Summary	Questions, Statements, and Arguments about AI Literacy in Higher Education
1	Developing a Model for AI Across the curriculum: Transforming the higher educatioon landscape via innovation in AI Literacy.	Jane Southworth	2023	The text discusses the significance of AI education in higher education curricula and stresses the need for AI literacy for all students. It highlights the initiatives taken by the University of Florida to introduce AI in all majors and launch an AI Across the Curriculum program. The program aims to equip students with the necessary skills for an AI-ready workforce through seed grants, academic programs, and career development initiatives. The article also emphasizes the interdisciplinary nature of AI education and its broader concepts of AI pedagogy and literacy.	Did not provide specific theoretical statements and arguments about AI literacy in higher education
2	Student's voice on generative AI: perceptions, benefits, and challenges in higher education	Cecilia Ka Yuk Chan	2023	The articles focus on the views of college students regarding the use of Generative AI (GenAI) technologies in education. They highlight the importance of educators and policymakers understanding the students' perceptions to effectively implement GenAI technology, address their needs and concerns, and promote learning outcomes.	States that it is impotant for students develop their AI literacy, which involves knowing the fundamentals of generative AI, how it operates, its advantages and disadvantages, as well as different uses in higher education.
3	Generative Artificial Intelligence: Implication and Conderations for	Tom Farrelly	2023	Discuss the importance of AI literacy in education and propose a framework for integrating AI into educational settings.	States that it is crucial to prioritize the ethical use of AI, develop AI literacy, and create frameworks for integrating AI in higher

	Higher Education Practice				education. This responsibility lies with educators, students, institutions, and policymakers.
4	The AI generation gap: Are Gen Z students more interested in adopting generative AI such as ChatGPT in teaching and learning than their Gen X and millennial generation teachers?	Cecilia Ka Yuk Chan	2023	Discusses the influence of Artificial Intelligence (AI) on education and the opinions of Generation Z and millennials in educational environments. It highlights the significance of responsible and ethical use of AI in education and emphasizes the need for more research in this field.	Emphasize the importance of responsible and ethical use of AI in education, the need for guidelines and policies to ensure its proper integration, and the potential generation gap in adopting GenAI in teaching and learning.
5	Future research recommendations for transforming higher education with generative AI	Thomas K.F. Chiu	2023	Explore the impact of Generative Artificial Intelligence (GenAI) on higher education from a student perspective. As well as identifying new learning outcomes, innovative learning approaches, and assessment methods that institutions should consider in response to the influence of GenAI.	The study recommends that institutions consider new literacies and their relationships, interdisciplinary teaching, and innovative pedagogies in response to the influence of Generative Artificial Intelligence (GenAI).
6	Learning with Generative Artificial Intelligence Within a Network of Co-Regulation	Jason M. Lodge	2023	Discuss the integration of AI in higher education, including self-regulated learning, evaluation, and its impact on teaching and learning.	The concept of AI literacy should extend beyond proficiency in using AI technologies to include a comprehensive understanding of their underpinning mechanisms, ethical considerations, and sociocultural implications.
7	Evaluating an Artificial Intelligence Literacy Programme for Developing University Students' Conceptual Understanding, Literacy,	Siu-Cheung Kong	2022	Discuss the development and evaluation of an AI literacy program for university students, with a focus on improving conceptual understanding, literacy, empowerment, and ethical awareness.	There is need to refocus AI literacy programs on conceptual development to ensure equal access to AI literacy for all people from all walks of life, promoting AI literacy among educated citizens with diverse backgrounds.

	Empowerment and Ethical Awareness				
8	Unleashing the Potential of Generative AI, Conversational Agents and Chatbots in Educational Praxis: A Systematic Review and Bibliometric Analysis of GenAI in Education	Aras Bozkurt	2023	Provides a systematic review and bibliometric analysis of the use of generative AI, conversational agents, and chatbots in educational settings. The study identifies important themes related to interaction and communication with generative AI, such as the effects on teaching and learning, the opportunities, challenges, and implications of using educational conversational agents.	Argues that building AI literacy is essential for shaping the future of education and preparing students for an AI-augmented world.
9	The role of ChatGPT in higher education: Benefits, challenges, and future research directions	Tareq Rasul	2023	Discuss the potential benefits and challenges of using ChatGPT, a generative AI model, in higher education within the context of constructivist learning theory. It emphasizes the need for AI literacy as part of graduate skills to enhance students' employability and readiness for the evolving job market.	States the need to include artificial intelligence (AI) literacy and its ethical use as part of graduate skills to prepare students for the evolving job market through strategic curriculum design.
10	Exploring the factors of students' intention to participate in AI software development	Shih-Yeh Chen	2022	Examine the effects of university students' perceptions of AI courses, AI programming self-efficacy, and AI literacy on their course satisfaction and intention to participate in AI software development.	AI literacy significantly affects AI programming self-efficacy, course satisfaction, and intention to participate in AI software development. In particular, the effect on self-efficacy is the strongest.
11	An artificial intelligence educational strategy for the digital transformation	Franciso J. Cantú-Ortiz	2020	Discusses the importance of integrating artificial intelligence (AI) into education to prepare students for the digital transformation to Industry 4.0 and emphasizes the	Organizations and academic institutions need to renew their curricula to incorporate AI trends and develop AI competencies and skills because AI give impact on employment, and there is a

	relevance of collaboration and synergy among AI and related fields, as well as the elements of an institutional strategy for embracing digital transformation.	need for educational institutions to develop curricula and training for learners of the new generations.

Research Question 1: The Importance of AI literacy in higher education

Based on the author's review, all studies consider AI literacy very important to master, especially for higher education students. The development of AI has become a catalyst in the world of higher education, requiring students to have a deep understanding of AI's basic concepts and applications. Understanding AI is more comprehensive than just operational skills; it is a deeper and more critical understanding. Most studies agree and emphasize the need for AI literacy in higher education that includes a comprehensive understanding of AI mechanisms, ethical considerations, potential biases in AI algorithms, limitations, impacts, and potential uses in higher education [11], [16]–[20]. AI literacy is also needed to address potential biases in AI algorithms and emphasize the need for human supervision in AI-based decision-making processes [21].

In the AI-driven modern world, AI literacy is becoming an essential competency that should be mastered by higher education students from various disciplines [16]. Given the importance of these competencies, AI literacy is not the exclusive domain of Science, Technology, Engineering, and Mathematics (STEM) disciplines, making it essential to introduce and integrate AI literacy across all disciplines [11], [18]. This opens up the view that a broad understanding of AI literacy is not the preserve of any particular discipline but rather a pressing universal need in the face of the rapid development of AI today.

All studies suggest that AI literacy skills in higher education can be developed by integrating it into the curriculum. Integrating AI literacy into the curriculum can empower students to become intelligent consumers and creators of AI content, encourage the development of students' critical thinking skills, and teach digital responsibility [22]. It is important to progressively introduce AI literacy through strategic curriculum planning and integrate it into assessments [19]. Organizations and academic institutions should update their curricula to include AI trends and develop AI competencies and skills in various knowledge areas, such as natural sciences, social sciences, arts and humanities, and health sciences [23]. Several studies highlight the significance of incorporating AI literacy as part of graduate skills to prepare students for the 21st-century job market in an ever-evolving world shaped by AI [11], [19], [24].

Research Question 2: The role of educators and institutions in fostering AI literacy among higher education students

Based on the literature review conducted by the authors, all the studies reviewed discussed the role of educators in promoting AI literacy among higher education students. All studies emphasized the importance of developing AI literacy programs in students' conceptual understanding, literacy, empowerment, and ethical awareness of AI use. Educators need to evaluate AI literacy programs to encourage AI literacy habits among students and even the general public [18]. Through existing studies, the role of educators is recognized as crucial in spreading this AI literacy awareness through the creation and teaching of AI-related courses to empower students to actively engage in the learning process despite the use of AI [16], [25]. These studies also suggest that educators should play a role in conveying a broader understanding of AI's capabilities, limitations, and impacts through AI literacy to help students critically evaluate AI-generated

content, distinguish between reliable and unreliable sources, and develop students' creative and innovative thinking skills while keeping in mind the moral, ethical, and social dimensions in the application process [17], [19], [20], [24]. The role of educators is also needed in guiding students to prepare for AI adaptation in the future, where AI technology has begun to become an integral part of their personal and professional lives by packaging case studies or project-based learning and through experiences interacting with experts so that the application of AI literacy can be optimized and ensure students who graduate are AI literate and ethical in their use [11], [21]–[23].

Based on the eleven studies reviewed by the authors, seven studies discussed the role of institutions in promoting AI literacy among students. These studies suggest that institutions should prioritize educating students on the responsible and ethical use of AI tools in various disciplines. Institutions should also incorporate cultural context into AI literacy frameworks by empowering students and educators to harness the full potential of these AI technologies safely [16], [19], [23]. It is important to develop AI literacy curricula that encourage students to engage in interdisciplinary learning and make informed decisions when using technology in their academic and non-academic pursuits. This can be achieved by emphasizing critical thinking, creativity, digital literacy, and AI ethics education. Educational resources and workshops should be provided to familiarize students with AI technologies and their social and ethical implications. In addition, transparency, accuracy, and privacy should be prioritized to foster trust and reduce potential risks. Institutions must also create new assessment strategies that cannot be easily replicated by AI tools, enabling students to appropriately use AI for AI literacy teaching and understanding [11], [17], [21], [24].

Research Question 3: The challenges and barriers faced by higher education in developing AI literacy skills

Based on the literature review conducted by the author, two of the eleven literatures stated the challenges and barriers higher education faces in developing AI literacy skills among students. Two key studies discuss these issues in detail. The study entitled "Evaluating an Artificial Intelligence Literacy Program for Developing" discusses the implementation of AI literacy through three AI-related courses, including Machine Learning, Deep Learning, and Developing Artificial Intelligence Applications. The study also evaluated students' ethical awareness through reflective writing using the AI and ethics keyword framework. The study results showed that the three courses successfully improved students' conceptual understanding, literacy, empowerment, and ethical awareness of AI literacy. However, it was found that all three courses are non-credit-bearing courses that do not provide academic credit upon completion, which can be said that these courses are only for personal development, skill enhancement, or gaining knowledge in a particular field without affecting academic records. As a result, these courses are perceived primarily as opportunities for personal development or skill enhancement, rather than essential academic pursuits. This perception has led to a notable decline in student enrollment and interest, as students prioritize credit-bearing courses directly contributing to their academic progression. The course system applied is an obstacle in the implementation of AI literacy where it is found that the number of students taking this course has decreased and is relatively small because it competes with courses that do offer credit. The absence of academic incentives thus poses a significant barrier to the adoption of AI literacy programs. Another barrier is that AI literacy courses are held during COVID-19, a period marked by widespread reliance on online learning**.** potentially impacting student interest in learning and participation in online teaching modes [18].

Another study titled "Learning with Generative Artificial Intelligence Within a Network of Co-Regulation," which is a literature review on the relationship between students and generative AI in their learning practices in higher education stated that there is a difficulty in integrating AI literacy into the curriculum because the current curriculum is already considered dense. There is a need for a more holistic approach to learning with AI by considering the interconnectedness of humans, machines, and systems. Based on this, this study emphasizes the need for deeper reflection through Self-regulated learning (SRL). SRL is a process in which students take control of their learning activities, including goal setting, progress monitoring, and strategy setting to achieve these goals. By fostering these skills, institutions can prepare students to navigate the complexities of an AI-integrated world more effectively. [20]. However, embedding SRL practices and AI literacy concepts within a packed curriculum remains a formidable challenge for educators and administrators

These challenges—ranging from the lack of academic credit to the constraints of dense curricula—underscore the need for innovative solutions. Integrating AI literacy into credit-bearing courses, reimagining the structure of curricula to accommodate interdisciplinary learning, and leveraging blended learning strategies could offer ways to overcome these barriers. Future studies and institutional initiatives should focus on addressing these systemic issues to make AI literacy an integral part of higher education.

3.2 DISCUSSION

Significant of Findings

We have conducted a scoping literature review on The Importance of Literacy on Artificial Intelligence for Higher Education Students. The authors selected 153 studies, of which 11 met the criteria and were eligible for inclusion in this review. We reviewed and analyzed these studies to answer the research questions that the authors had formulated regarding the importance of AI literacy for higher education students, the role of educators and institutions in promoting AI literacy in higher education, and the challenges and barriers in developing AI literacy in higher education.

Answering the first research question, it was concluded that all reviewed studies emphasized the need for AI literacy for higher education students. In response to the rapid development of AI and its influence on various sectors and disciplines, criticizing previous studies, some studies state that AI literacy is not a competency that must be exclusively mastered by students in specific fields of science but has become an essential and crucial competency to be mastered by all disciplines formulated [11]. The development of AI literacy skills for tertiary students can be done by integrating them with the teaching curriculum, evaluating them through assessment, and establishing them as skills that graduates must master [19]. Recognizing and developing AI literacy skills can equip students to interact with AI tools critically and wisely [22] and prepare students to face the 21st-century workplace that often intersects with AI.

The second research question found that the role of educators and higher education institutions in promoting AI literacy among students is vital. The reviewed studies highlighted the urgency of developing AI literacy programs to enrich students' conceptual understanding, literacy, empowerment, and ethical awareness of AI use. Implementing AI literacy programs accompanied by evaluation by educators is a crucial step [18]. This is because educators are responsible for conveying an understanding of AI's capabilities, limitations, and impacts through AI literacy programs [20]. Students are expected to evaluate AI content critically, determine reliable sources, and develop creative and innovative thinking skills so that they can face future developments in AI technology with an understanding of proper ethics [17], [19], [24]. One of the steps that can be

taken from this AI literacy program is the creation of AI-related courses [25]. This intersects with higher education institutions that play a role in highlighting the application of AI literacy among students. Institutions are responsible for creating adaptive education by empowering students and educators to utilize the potential of AI technology with proper responsibility and ethics [16], [21], [23]. Institutions can also provide educational resources such as workshops to familiarize students with AI technology and its ethics. [11], [17].

Finally, the third research question found challenges and barriers to implementing AI literacy in higher education. The two pieces of literature led to the conclusion that implementing literacy in Higher Education through courses successfully increased the understanding and awareness of AI ethics among students. However, barriers arose because the courses programmed were no-credit-bearing courses that did not give students academic credit, thus making students have little interest. In addition, the implementation of the course is also constrained by the implementation of online learning due to the impact of COVID-19 [18]. It was also found that there is difficulty in integrating AI literacy into the curriculum because it is considered to be dense, so a holistic approach is offered through the Self-regulated Learning (SRL) program, which emphasizes learning with students as the main actors in developing their AI literacy skills [20].

Implication for Research

Essential implications from the results of the literature review on The Importance of Literacy on Artificial Intelligence for Higher Education Students highlight several areas that need attention in future studies. First, in response to the problem of the crowded learning curriculum in higher education [20], future research can focus on developing effective strategies for the integration of AI literacy in a curriculum that has been compacted by various credit courses and strategies to encourage students to engage in learning and developing AI literacy skills. In addition, future studies can address and pay special attention to the application of self-regulated learning and its integration in the context of AI learning among college students, emphasizing each individual's experience and self-awareness.

Implication for Practice

Based on the literature review that has been conducted, there are significant implications for practice by educators and institutions that play a crucial role in introducing an understanding of AI literacy in the educational environment, especially for students. Educators are expected to evaluate AI literacy programs by incorporating AI literacy learning into the curriculum so that it can be a step in helping students adapt to AI through hands-on experience, critical thinking, and ethical values [17], [24]. Higher education institutions can also involve students in curriculum development by providing educational resources related to AI literacy. Creating a course on AI literacy with a credit-bearing system can be an exciting strategy to encourage student's interest in participating in developing their AI literacy skills. Implementing Self-regulated Learning (SRL) can also be a step in developing students' skills to prepare themselves for the modern era that has been integrated with AI [20].

Limitation

The literature study on The Importance of Literacy on Artificial Intelligence for Higher Education Students has several limitations that must be considered. First, we found it challenging to source literature studies published in Indonesia, indicating a need for local academic contributions in exploring AI literacy. Secondly, the number of studies included in this review is

notably limited, with only 11 studies being considered in the final analysis. This limited sample size may restrict the generalizability of the findings. Thirdly, from all the literature that has been analyzed, we found limited discussion of literature studies evaluating the application of AI literacy in higher education, resulting in a lack of evaluative data in measuring the barriers and challenges of AI literacy designed in Research Question 3. Through this limitation, it is hoped that future research can be more numerous and focus on discussing AI literacy in Indonesia's higher education context. Future studies should aim to include a larger and more diverse set of studies to enhance the robustness and applicability of the results. In addition, future research can explore aspects of AI literacy in higher education with a more in-depth focus, such as learning models, curriculum evaluation, and the impact of student understanding. Finally, more in-depth research can also be conducted that discusses the identification of challenges and obstacles in the application of AI literacy in higher education so that it can provide concrete recommendations for improvement in its application in the future.

4. CONCLUSION

The integration of AI literacy into higher education is crucial in light of the significant growth of artificial intelligence, which has emerged as a catalyst in the field of education. By fostering AI literacy in students, they can gain a comprehensive understanding of the mechanisms of AI, including ethical and moral considerations, impacts, and potential applications. Educators and institutions must play a central role in this integration to develop strategic plans that support success and overcome any potential barriers. However, the lack of studies that address the evaluation of the importance of AI literacy in higher education and its implications primarily for the entire discipline limits us from making a statement that presents reliable information on this topic. Therefore, we hope that researchers continue to study this topic and implement and empirically evaluate the applicability of AI literacy for college students.

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