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THE ROLE OF INFORMATION LITERACY IN ENHANCING STUDENTS' CRITICAL THINGKING SKILLS

Iwin Ardyawin[1], Habiburrahman[2]

[1]Perpustakaan dan Sains Informasi, Universitas Muhammadiyah Mataram, Indonesia
[2]D4 Kearsipan Fakultas Hukum, Ilmu Sosial dan Ilmu Politik, Universitas Terbuka, Indonesia
* Coresponden Author E-mail: iwinardyawin@gmail.com

ABSTRACT

This systematic literature review investigates "The Role of Information Literacy in Enhancing Students' Critical Thinking Skills" utilizing sources indexed in Scopus, DOAJ, and Google Scholar, focusing on publications from the last 10 years. This study employs a qualitative research method with a Systematic Literature Review approach to explore the role of information literacy in enhancing students' critical thinking abilities over the past decade. The findings underscore the foundational role of information literacy in developing students' critical thinking capabilities. The study suggests that the success of integrating information literacy into higher education curricula is highly dependent on the approaches employed. Effective integration of information literacy requires careful consideration of instructional methods and curriculum design. The review highlights the importance of incorporating information literacy courses within academic programs to equip students with essential skills for critically evaluating information. Furthermore, it emphasizes the need for tailored strategies to address diverse student needs and contextual factors. Ultimately, the findings advocate for a comprehensive approach to integrating information literacy into higher education curricula, recognizing its pivotal role in nurturing students' critical thinking skills. Further research is warranted to explore best practices for integrating information literacy effectively across various disciplines and educational contexts.

Key Words: information literacy, critical thinking, students.

1. INTRODUCTION

In the modern context, information literacy has become an essential skill, particularly for university students. Information literacy is defined as the ability to identify, search, evaluate, and use information effectively (Aharony & Bronstein, 2013). This skill is crucial because, in today's digital era, the vast amount of available information is not always reliable. Students, who are at a critical stage of academic learning and development, need to have strong information literacy skills to optimally utilize informational resources. Information literacy not only aids students in completing academic tasks more efficiently but also equips them with the ability to make decisions based on valid and relevant information, both in academic settings and everyday life. Therefore, information literacy is a foundational element that supports the academic and professional success of students in the future.

Critical thinking is a skill that encompasses the ability to analyze, evaluate, and synthesize information in order to make sound decisions (Alsaleh, 2020). This skill is crucial in the context of higher education as it plays a vital role in assisting students in the learning process and problem-solving. Through critical thinking, students can assess various information sources, consider multiple perspectives, and make decisions based on thorough and logical analysis (Liu et al., 2014). Additionally, critical thinking skills enable students to identify biases, evaluate arguments, and develop creative solutions to complex problems. Therefore, fostering critical thinking abilities is a primary objective in higher education, as it supports students in achieving academic and professional success.

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The theoretical relationship between information literacy and critical thinking is very strong (Changwong et al., 2018). Information literacy provides a solid foundation for critical thinking, as one of its key components is the ability to critically evaluate information (Sparks et al., 2016). Students with strong information literacy skills can identify credible sources, analyze the content carefully, and effectively use the information in decision-making. Previous research has shown that good information literacy can support the development of critical thinking skills (Kong, 2014). Therefore, enhancing information literacy among students not only helps them access and use information efficiently but also strengthens their ability to think critically and analytically.

Today's students face challenges in developing information literacy and critical thinking skills, crucial for navigating the vast amount of information available. Studies emphasize the importance of integrating digital and information literacy into education to enhance critical thinking skills (Cintamulya et al., 2023). The shift towards electronic texts highlights the need for students to improve comprehension through reading to boost critical thinking (Widyaningrum et al., 2023). Training programs focusing on critical thinking and media literacy have shown positive results in enhancing these competences among students (Tommasi et al., 2023). Academic librarians play a vital role in cultivating critical thinking skills in relation to information literacy, especially for first-year college students (Goodsett & Schmillen, 2022). Additionally, research indicates a positive relationship between critical thinking skills and information literacy in identifying fake news on social media, emphasizing the importance of these skills for evaluating information credibility (Niza et al., 2022).

Various methods have been employed to enhance information literacy in higher education, including integrating information literacy into the curriculum, utilizing digital technologies, and providing specialized library training. Studies have shown that educational technologies play a crucial role in teaching information and library disciplines, contributing to the development of information and analytical competencies essential for training highly qualified specialists in information and library institutions (Arakelov, 2023). Additionally, factors such as network computer technology, network autonomous learning ability, and overall quality of teachers and students in universities have been identified as positively correlated with information literacy levels, emphasizing the importance of these aspects in educational settings (Ye et al., 2023). Furthermore, the evolution of information literacy conceptualizations within primary, secondary, and higher education environments highlights the dynamic nature of information literacy frameworks and the need for continuous adaptation to meet the demands of the digital age (Taylor & Digiacomo, 2023). Moreover, the Canadian educational system serves as a model for modernizing library specialist training, emphasizing interdisciplinary and versatile educational programs that incorporate digital literacy and autonomy to produce competitive graduates in the information market (Laplagne Sarmiento & Urnicia, 2023).

Research has shown a significant relationship between information literacy and critical thinking skills among students. Studies have indicated that writing scientific articles through optimizing digital and information literacy positively impacts students' critical thinking abilities (Cintamulya et al., 2023). Furthermore, the incorporation of critical information literacy (CIL) into academic library curricula has faced challenges, with pushback from various stakeholders threatening the integrity of CIL programs (Williams & Kamper, 2023). Additionally, research has demonstrated a positive correlation between scientific literacy and critical thinking skills, emphasizing the importance of scientific literacy in enhancing critical thinking among students (Aston, 2023). Moreover, the development of Media and Information Literacy (MIL) has been linked to socioformative factors, with age, gender, access to basic services, and the type of educational institution influencing the levels of MIL achievement among students (Ridzal & Haswan, 2023). These findings collectively highlight the

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crucial role of information literacy in fostering and improving students' critical thinking skills across various educational settings.

From the literature review conducted, several gaps can be identified. Firstly, although there are studies indicating a positive relationship between information literacy and critical thinking skills among students, there is still a lack of in-depth understanding regarding the underlying mechanisms of this relationship. Additionally, there is limited research specifically exploring how the enhancement of information literacy can directly impact students' critical thinking abilities within the context of current information technology and digital developments. Secondly, while there are studies investigating the effectiveness of training methods and curricula integrating information literacy in enhancing critical thinking skills, there remains a need for a comprehensive systematic review to develop a more thorough understanding of these methods and the extent to which they have succeeded in enhancing students' critical thinking abilities. Therefore, this study aims to address these gaps by conducting a systematic literature review to investigate the role of information literacy in enhancing students' critical thinking skills, with a focus on identifying the most effective strategies and approaches in developing both skills in the higher education context.

2. RESEARCH METHODLODY

This study employs a qualitative research method with a Systematic Literature Review used to identify, evaluate, and synthesise research results relevant to a particular research question in a systematic and structured manner, to explore the role of information literacy in enhancing students' critical thinking abilities over the past decade. The research purpose is to investigate the relationship between information literacy and students' critical thinking skills, as well as to identify the most effective strategies and approaches in developing these skills within the higher education context. Literature search is conducted through prominent academic databases such as Google Shcolar, Scopus, and DOAJ using relevant search terms such as "information literacy," "critical thinking," "students," and other related variations. Inclusion criteria for articles entail being published within the last 10 years from 2013 to 2023, available in English, and specifically addressing the relationship between information literacy and critical thinking skills among students. Articles that do not meet these criteria or are irrelevant to the research topic will be excluded from analysis. Article selection is carried out in stages by two independent researchers, with the first stage involving screening based on titles and abstracts, followed by a full-text evaluation by the second reviewer on the selected articles. Relevant data from the selected articles are then extracted and synthesized in a format pertinent to the research objectives. Through this approach, the study aims to provide comprehensive insights into the relationship between information literacy and students' critical thinking skills, contributing to both theoretical and practical understanding within higher education, as shown in Figure 1.

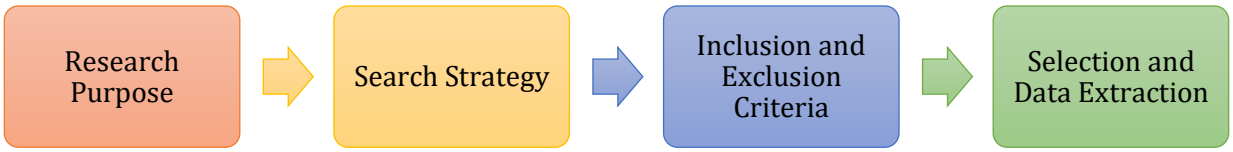

Figure 1. Stages of the Research Method

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3. RESULTS AND FINDINGS ANALYSIS

The following presents an analysis of findings from various studies concerning information literacy and critical thinking, focusing on strategies, methods, and challenges within the higher education context. This data provides insights into the diverse approaches utilized to integrate information literacy into higher education curricula, alongside the challenges encountered in its implementation. This analysis aids in comprehending the current research landscape aimed at enhancing students' critical thinking skills through information literacy development, as Shown in Table 1.

Table 1. Analysis of Research Findings on Information Literacy and Critical Thinking: Strategies, Methods, and Challenges in Higher Education Context

No	Focus Area	Authors	Insight or Research Variables
1	Information Literacy and Critical Thinking	Cintamulya et al. (2023), Goodsett & Schmillen (2022), Widyaningrum et al. (2023), Niza et al. (2022)	Positive relationship between information literacy and critical thinking. Impact of information literacy optimization on critical thinking skills. Correlation between literacy skills and critical thinking. Information literacy empowering students to discern fake news, enhancing critical thinking.
2	Strategies for Integrating Information Literacy	Laplagne Sarmiento & Urnicia (2023), Taylor & Digiacomo (2023), Thorn (2022), Liao & Tian (2022)	Prioritizing skills training, digital literacy, and learning autonomy. Adaptation of course designs to include information literacy content. Importance of critical information literacy and diverse educational strategies. Dynamic approach needed for evolving information literacy in the digital age.
3	Effective Methods for Information Literacy	Jayanti (2021), Mulyono & Halim (2015), Fatmawati (2016)	Specially designed learning modules enhancing information competencies. Integration of information literacy from an Islamic perspective improving critical analysis. Collaborative approaches and digital technologies improving information literacy skills.
4	Challenges in Implementing Information Literacy Programs	Hannah (2023), Lowe et al. (2023), AOUAF et al. (2023), Pero (2020), Juwita & Hamidah (2018), Salmubi (2020), Oktaviani et al. (2022)	Challenges related to teaching methods, student engagement, and educational system. Preparation, guidance, and motivation required for successful implementation of innovative teaching models. Weak concept understanding leading to difficulties in developing critical thinking skills. Necessity for training and guidance in effective information retrieval. Varying levels of information literacy among students. Importance of user empowerment within library services. Technical and user-related challenges in integrating technology into programs.

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a. Impact of Information Literacy on Students' Critical Thinking Skills

Information literacy plays a crucial role in shaping students' critical thinking abilities. Studies have shown that there is a positive relationship between information literacy and critical thinking skills (Cintamulya et al., 2023). Enhancing information literacy through digital and information literacy optimization can significantly impact students' critical thinking skills, as evidenced by the effect of writing scientific articles on critical thinking (Goodsett & Schmillen, 2022). Additionally, literacy skills have been found to positively correlate with students' critical thinking skills, indicating a strong connection between the two aspects (Widyaningrum et al., 2023). Furthermore, in the context of combating misinformation, information literacy empowers students to identify reliable sources and discern fake news, thereby sharpening their critical thinking skills (Niza et al., 2022). Overall, fostering information literacy not only equips students with the necessary tools to navigate the vast amount of information available but also cultivates their ability to think critically and evaluate information effectively.

Several previous studies have highlighted the relationship between information literacy and students' critical thinking skills. Research by Rahmawati (2019) underscores the urgency of information literacy classes for students at Ahmad Dahlan University Library in Yogyakarta, indicating that a solid understanding of information literacy can enhance students' abilities to critically evaluate encountered information. Additionally, Ririen & Daryanes (2022) study on the analysis of students' digital literacy reveals that students with strong digital literacy tend to exhibit better critical thinking skills when confronting complex digital information. Similarly, findings from research by Cahyono (2022) examining the effectiveness of information literacy instruction in fostering critical thinking among first-year students demonstrate that information literacy instruction can reinforce students' abilities to critically analyze and evaluate information, essential skills for developing critical thinking.

The findings indicate that information literacy plays a foundational role in the development of students' critical thinking capabilities. Rahmawati (2019) emphasizes the importance of integrating information literacy courses into academic curricula, highlighting information literacy's pivotal role in providing students with the essential skills to critically assess information. Ririen & Daryanes (2022) further clarify that students possessing strong digital literacy tend to demonstrate superior critical thinking abilities when confronted with intricate digital content, emphasizing the significance of digital literacy in nurturing critical thinking. Additionally, Cahyono (2022) study underscores the efficacy of information literacy education in fostering critical thinking among first-year students, emphasizing its role in refining students' analytical and evaluative competencies. The evidence from these studies underscores the crucial role of information literacy in fostering students' critical thinking skills. However, it is important to acknowledge potential limitations, such as variations in sample size and contextual factors, which may affect the applicability of the findings. Moreover, while the studies collectively illustrate the positive influence of information literacy on critical thinking, further research is needed to delve deeper into the mechanisms that underpin this relationship and explore potential moderating variables.

b. Effective Strategies and Methods for Integrating Information Literacy into Higher Education Curricula

Effective strategies for integrating information literacy into higher education curricula include prioritizing skills training, digital literacy, and learning autonomy (Laplagne Sarmiento & Urnicia, 2023). Additionally, it is crucial to adapt course designs by adding new content and assignments focused on information literacy to better equip students for academic success (Taylor & Digiacomo, 2023). Critical information literacy has emerged as a top priority, emphasizing the need for diverse

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and effective educational strategies such as original material analysis, reflection, and critical reading (Thorn, 2022). Furthermore, the evolving landscape of information literacy in the digital age necessitates a dynamic approach, with scholars advocating for contextual frameworks, stakeholder perceptions evaluation, and the incorporation of information practice into educational frameworks (Liao & Tian, 2022). Ultimately, integrating information literacy into higher education curricula requires a multifaceted approach that addresses the changing demands of the 21st-century information environment.

Literasi informasi: peningkatan kompetensi informasi previous research has identified various effective strategies and methods for integrating information literacy into higher education curricula. One study highlights that information literacy can enhance students' information competencies in the learning process through the use of specially designed learning modules that develop information search and evaluation skills (Jayanti, 2021). Another study underscores the importance of information literacy and critical thinking from an Islamic perspective and how integrating these aspects into the education curriculum can improve students' critical analysis and deep understanding (Mulyono & Halim, 2015). Additionally, research on strategies to enhance students' information literacy competencies in supporting the Three Pillars of Higher Education demonstrates that collaborative approaches between faculty and librarians, as well as the use of digital technologies in learning, can significantly improve students' information literacy skills, thereby supporting research, teaching, and community service activities (Fatmawati, 2016). Thus, integrating information literacy into higher education curricula through structured and contextual methods has been proven effective in developing students' critical thinking skills.

From these studies, it can be interpreted that the success of integrating information literacy into higher education curricula largely depends on the approaches employed. Well-designed learning modules aid students in developing specific and relevant skills. Different perspectives, such as the Islamic perspective presented by Mulyono & Halim (2015), provide a more holistic framework that can enhance critical analysis skills and understanding. Collaboration among various stakeholders in the academic environment, as highlighted by Fatmawati (2016), underscores the importance of interdisciplinary approaches and the use of modern technology to strengthen information literacy. Evaluations of the outlined strategies and methods indicate that specialized learning modules are effective in establishing a strong foundation of information skills. A holistic approach that combines information literacy with critical thinking within cultural or religious frameworks can add value by fostering deeper analytical capabilities. Collaborative approaches and the use of digital technology highlight the importance of synergy between faculty, librarians, and technology in delivering a comprehensive learning experience. However, each approach presents its own challenges, such as the need for adequate resources and resistance to curriculum changes.

c. Challenges in Implementing Information Literacy Programs to Enhance Students' Critical Thinking Skills

The challenges faced in implementing information literacy programs to enhance students' critical thinking skills include obstacles related to teaching methods, student engagement, and the educational system (Hannah, 2023). Additionally, the application of innovative teaching models like the Group Investigation Model (GIM) requires careful preparation, lecturer guidance, and student motivation to be successful, highlighting challenges in the learning process and outside learning aspects (Lowe et al., 2023). Furthermore, difficulties in developing critical thinking skills stem from weak concept understanding, leading to passive learning behaviors and low student outcomes (AOUAF et al., 2023). These challenges underscore the need for tailored approaches that address

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barriers in teaching practices, student involvement, and concept comprehension to effectively enhance critical thinking skills through information literacy programs.

The implementation of information literacy programs aimed at enhancing students' critical thinking skills encounters several challenges. One significant challenge is the necessity for training and guidance in effective information retrieval (Pero, 2020). Students often have varying levels of information literacy, which creates disparities in their ability to engage with and benefit from these programs (Juwita & Hamidah, 2018). Another critical aspect is the empowerment of users within library services, which is essential for fostering an environment where students feel confident and capable in their information-seeking activities (Salmubi, 2020). Moreover, the integration of technology into these programs introduces additional hurdles. For instance, the use of Extreme Programming in web-based student creativity initiatives can present both technical and user-related challenges, requiring careful consideration and support to ensure successful implementation (Oktaviani et al., 2022).

These challenges underscore the multifaceted nature of implementing information literacy programs aimed at enhancing critical thinking skills. They reflect not only pedagogical hurdles but also issues related to student motivation, engagement, and conceptual understanding. The need for effective teaching methods, lecturer guidance, and student involvement is evident in ensuring the success of these programs. Weaknesses in concept comprehension pose a fundamental barrier to the development of critical thinking skills, highlighting the importance of addressing foundational knowledge gaps. The challenges identified suggest that successful implementation of information literacy programs requires comprehensive solutions that address various aspects of teaching and learning. While innovative teaching models like GIM offer promising avenues for enhancing critical thinking, they also demand significant preparation, guidance, and motivation from both lecturers and students. Weaknesses in concept understanding indicate the necessity for tailored instructional approaches and interventions to foster active learning and deeper understanding among students. The following illustrates an analysis of the development of research variables in studies of information literacy and critical thinking from 2013 to 2024. This analysis provides an overview of the evolution of research topics and focuses found in the literature during that period, as depicted in Figure 1.

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Figure 2. Development of Research Variables in Information Literacy and Critical Thinking Studies: Analysis Based on Year of Research (2013-2024)

In Figure 2, it is evident that the studies highlighted various aspects concerning information literacy and students' critical thinking skills. During the period from 2013 to 2014, research primarily focused on developing learning models and information literacy modules, along with evaluating students' critical thinking abilities. During these years, studies tended to identify effective strategies and approaches for integrating information literacy into higher education curricula, along with assessing its impact on students' critical thinking skills. The timeframe of 2015-2016 showed a shift towards research that delved deeper into the relationship between information literacy and critical thinking within the context of digital technology development. Moreover, studies during this period also emphasized the significance of information literacy in recognizing and addressing misinformation in the digital era. The years 2017-2018 exhibited research exploring the role of information literacy in supporting technology-based learning and the development of critical thinking skills through collaborative approaches among various stakeholders in higher education. In the period of 2019-2020, research tended to focus on the necessity for inclusive information literacy and evaluating strategies to enhance critical thinking skills amidst the dynamics of social media. The timeframe of 2021-2022 revealed research more concentrated on implementing information literacy programs and the associated challenges, including strategies to strengthen collaboration between faculty and librarians and the utilization of digital technology in education. In the most recent years, 2023-2024, there has been increased attention on evaluating the effectiveness of information literacy

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programs in enhancing students' critical thinking skills, with an emphasis on innovative teaching strategies and adaptation to changes in the information environment. Overall, the development of these research variables reflects ongoing efforts to enhance understanding of the relationship between information literacy and critical thinking in the context of higher education, emphasizing practical application and the challenges encountered in implementation.

4. CONCLUSION

Based on the evaluation of these findings, it can be concluded that information literacy plays a foundational role in developing students' critical thinking abilities. The importance of integrating information literacy courses into academic curricula becomes evident, highlighting the pivotal role of information literacy in equipping students with essential skills for critical assessment of information. Moreover, it is further clarified that students with strong digital literacy tend to exhibit superior critical thinking abilities when confronted with complex digital content, emphasizing the significance of digital literacy in fostering critical thinking. Additionally, the study underscores the effectiveness of information literacy education in cultivating critical thinking among first-year students, accentuating its role in honing students' analytical and evaluative competencies. The evidence from these studies underscores the crucial role of information literacy in fostering students' critical thinking skills. However, it is important to acknowledge potential limitations, such as variations in sample size and contextual factors, which may affect the applicability of the findings. Furthermore, while the studies collectively illustrate the positive influence of information literacy on critical thinking, further research is needed to delve deeper into the mechanisms that underpin this relationship and explore potential moderating variables.

A research gap that still needs to be addressed lies in gaining a deeper understanding of how the integration of information literacy can effectively enhance students' critical thinking abilities in the context of higher education. More in-depth studies can explore the most effective implementation strategies, factors moderating the relationship between information literacy and critical thinking, and challenges that may arise in the integration process. Therefore, an urgent research topic for future investigation is "The Impact of Integrating Information Literacy on Students' Critical Thinking Abilities in Higher Education Context: A Systematic Approach." Further research in this area will provide deeper and contextual insights into how information literacy can be effectively implemented to enhance students' critical thinking abilities, as well as identifying the best strategies to overcome potential challenges.

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