

The Transformation of Character Education Based on Local Wisdom in the Age of Artificial Intelligence: Trends, Challenges, and Opportunities for Implementation in Elementary Education

Regina Dealova¹, Safruddin Muhdar², M. Aris Akbar³

¹²³Elementary School Teacher Education Program, Muhammadiyah University of Mataram, Indonesia,
dealova150906@gmail.com, rudybastrindo@gmail.com, muhammadarisakbar

Abstract: Character education based on local wisdom in the era of Artificial Intelligence (AI) is a strategic issue in 21st-century educational development, which demands a balance between cultural values and technological progress. This study aims to analyze the trends, challenges, and opportunities for implementing character education based on local wisdom in the era of Artificial Intelligence. The method used was a Systematic Literature Review (SLR), examining scientific articles obtained from Google Scholar, Scopus, DOAJ, Elicit, Scite.ai, and SciSpace within the timeframe of 2016–2026. The results of the review indicate that character education based on local wisdom has experienced significant development and is considered effective in strengthening students' moral values, ethics, and cultural identity. On the other hand, the use of AI offers opportunities to create learning processes that are more adaptive, personalized, and interactive. However, its implementation still faces various challenges, such as low digital literacy, limited educator competencies, the digital divide, and the potential for a weakening of the internalization of cultural values and character. The findings also indicate that the integration of AI and local wisdom can serve as an effective strategy for strengthening character education in the digital age. This study confirms that the success of character education in the AI era requires a balance between the use of technology and the reinforcement of local wisdom values. It is hoped that these findings will serve as a reference for educators, policymakers, and researchers in developing a character education model that adapts to technological advancements without neglecting cultural and moral values.

Keywords: Character Education, Local Wisdom, Artificial Intelligence, Elementary Education

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A. INTRODUCTION

Character education is a systematic educational effort aimed at developing students' moral values, ethics, and personality so that they are able to behave in accordance with the norms prevailing in society (Suciati et al., 2023). In elementary education, character education plays a vital role as the foundation for shaping positive attitudes and behaviors from an early age (Cholifah & Faelasup, 2024). In addition to focusing on academic aspects, character education also emphasizes the development of students' affective and social aspects. One source of values that has the potential to support the strengthening of character education is local wisdom. Local wisdom encompasses values, norms, traditions, and cultural practices that have been passed down from generation to generation within a community. Values such as mutual cooperation, honesty, responsibility, tolerance, and social concern are strongly aligned with the goals of character education and can thus serve as a foundation for shaping students of good character and noble ethics (Hang, 2025).

Advances in Artificial Intelligence (AI) have brought significant changes to the field of education by providing learning services that are more adaptive, personalized, and effective, tailored to the needs of students (Chen et al., 2020). The use of AI enables students to have a more flexible learning experience through automated systems, real-time feedback, and broad access to digital learning resources. However, these developments also present challenges related to ethics, responsibility, independent learning, and the character development of students (Sadeeq Akintola et al., 2025). The use of technology that is not balanced with the reinforcement of character values has the potential to foster dependency and diminish critical thinking skills and the ability to make wise decisions. The integration of character education rooted in local wisdom is a crucial strategy for maintaining a balance between technological advancement and the character development of students in the era of Artificial Intelligence (Sawitri, 2025).

Advances in Generative Artificial Intelligence (GenAI) have opened up various opportunities to improve the quality of learning in elementary education (Sakinah et al., 2025). Various studies indicate that the use of GenAI, such as ChatGPT, Gemini, and Claude, can support more personalized, adaptive, and interactive learning, thereby increasing student engagement, motivation, and learning outcomes (Rathore et al., 2022). The results of a meta-analysis of 34 studies indicate that GenAI has a significant positive effect on learning outcomes with an effect size of 0.68 ($p < 0.001$), particularly in cognitive aspects ($g = 0.795$) (Qu et al., 2025). Another study also found that GenAI has a positive impact on students' academic achievement (0.857) and learning motivation (0.803) (Gu & Yan, 2025). Nevertheless, its implementation still faces challenges, such as information accuracy, the risk of technology dependence, data privacy issues, and limitations in teacher competence (Amo et al., 2021). Improving AI literacy and reinforcing character values and ethics are necessary to ensure that GenAI is utilized responsibly and optimally.

The use of Artificial Intelligence (AI) in education presents various ethical challenges, particularly regarding data privacy, algorithmic bias, and changes in the role of educators in the learning process (Yadav, 2024). Various studies indicate that the use of AI involves the processing of large amounts of student data, which has the potential to pose risks to the security of personal information (Tandirerung, 2025). Furthermore, algorithmic bias can affect equity in educational services and widen social disparities (Tojimuxammadov, 2025). UNESCO data from 2023 indicates that fewer than 10% of educational institutions have formal policies regarding AI, while approximately 60% of educators still require training in the ethical use of AI (Kaşarcı et al., 2025). These findings indicate that educational institutions' readiness to adopt AI technology still faces various limitations (Mehdaoui, 2024). Furthermore, the use of AI without adequate ethical guidelines has the potential to diminish the role of teachers as the primary facilitators of learning.

Based on the findings of previous studies, Generative Artificial Intelligence (GenAI) has great potential to improve the quality of learning, but it also presents ethical challenges that can influence students' character development. Although research on AI in education and character education based on local wisdom continues to grow, studies that integrate AI, character education, and local wisdom in the context of elementary education remain limited.

This situation highlights a research gap regarding the use of local wisdom as a foundation for character development in the AI era. The novelty of this study lies in its analysis of trends, challenges, and opportunities for implementing character education based on local wisdom in the era of Artificial Intelligence. This study aims to identify developments in the literature, analyze challenges, and explore opportunities for implementation. The results are expected to enrich theoretical discourse and serve as a reference for educators, policymakers, and researchers in integrating technology with the character development of students.

B. METHOD

This study employs a Systematic Literature Review (SLR) approach to identify, analyze, and synthesize various research findings related to character education based on local wisdom in the era of Artificial Intelligence (AI). The study aims to examine development trends, challenges, and opportunities for implementing character education based on local wisdom in the AI era. The SLR approach was chosen because it allows for a systematic, transparent, and replicable process of literature search and synthesis. Research data sources were obtained from several scientific databases, namely Google Scholar, Elicit, Scite.ai, SciSpace, DOAJ, and Scopus, covering publications from 2016 to 2026. The literature search was conducted using a number of keywords, including character education, local wisdom, artificial intelligence, generative artificial intelligence, education technology, digital learning, elementary education, and moral education. The research process flowchart is presented in Figure 1.

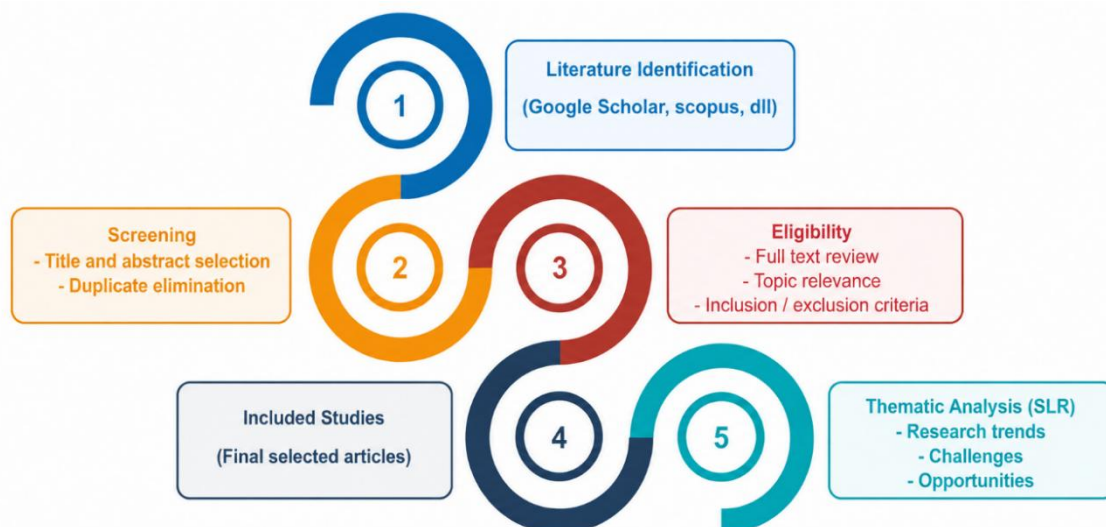


Figure 1. Research Process Flowchart

Figure 1 illustrates the stages of a Systematic Literature Review (SLR), which include identification, screening, eligibility assessment, and literature synthesis. The literature search was conducted using the keywords “character education,” “local wisdom,” “artificial intelligence,” “generative artificial intelligence,” “I in education,” “education technology,” “digital learning,” “elementary education,” “primary education,” “local culture,” “moral education,” and “character building.” Inclusion criteria included: (1) articles published between 2016 and 2026; (2) articles discussing character education, local wisdom, artificial

intelligence, or the interrelationships among them; (3) articles published in indexed national or international journals; and (4) articles available in full text. Exclusion criteria include articles published outside the study period, those irrelevant to the research focus, proceedings, books, undergraduate theses, master's theses, doctoral dissertations, and editorials, as well as duplicate articles found in more than one database.

The literature review was conducted in several stages: identification, screening, eligibility assessment, and selection of final articles that aligned with the research objectives, in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Articles that met the criteria were then analyzed using thematic analysis to identify key themes, research trends, challenges, and opportunities for implementing character education based on local wisdom in the AI era. To ensure the validity and reliability of the research results, the selection and analysis processes were conducted systematically based on established criteria and supported by transparent documentation of the literature search and evaluation processes, thereby enabling the study to be replicated by other researchers.

C. RESULTS AND DISCUSSION

Based on the results of a literature search and selection using the Systematic Literature Review (SLR) method, a number of articles relevant to the study of character education based on local wisdom in the era of Artificial Intelligence (AI) were identified. These articles were then analyzed and grouped according to common research fields or focuses to support the systematic data synthesis process. The classification results revealed six main research focuses for the 2016–2026 period, namely: (1) character education based on local wisdom; (2) the integration of Artificial Intelligence and local wisdom in character education; (3) challenges in implementing character education in the digital age; (4) strengthening moral and ethical values in character education; (5) strengthening cultural identity through local wisdom; and (6) the integration of local wisdom and Artificial Intelligence in character education. The grouping of these themes aims to identify research trends, analyze implementation challenges, and explore opportunities for developing character education based on local wisdom in the digital age. A summary of the literature synthesis results is presented in Table 1.

Table 1. Literature Review on Character Education Based on Local Wisdom in the Age of AI

No	Field/Focus	Author's name	Insights/Research Variables
1	Character Education Based on Local Wisdom	Hindaryatiningsih et al. (2026) Wijayanti et al. (2025) Asror et al. (2024)	Strengthening character education based on local wisdom as the foundation for fostering students' moral, ethical, and social values. Local wisdom plays a role in strengthening cultural identity, instilling character values, and supporting learning that is contextual and relevant to students' environments.

Integrating Artificial Intelligence and Local Wisdom into Character Education	Song & Rabu (2025) Kitsantas et al. (2019) Handoko & Sakti (2023) Ponorogo et al. (2026) Badeni & Saparahayuningsih (2023)	The complementary integration of AI and local wisdom, in which AI serves as a driver of learning innovation, while local wisdom provides the foundation of values for the development of students' character, cultural identity, and social attitudes.
Challenges in Implementing Character Education in the Digital Age	Badeni & Saparahayuningsih (2023); Joshi Prem Lal (2025); Sanjani (2024); Siska et al. (2026); Owston (2017); Emier Azka et al. (2025); Dwi Rahmah & Hamami (2025); Zou et al. (2025)	Challenges in implementation include limited access to technology, low digital literacy, a lack of teacher competence, and the suboptimal use of technology to support the strengthening of character values and local culture.
Strengthening Moral Values and Ethics in Character Education	Down et al. (2025); Tobias et al. (2025); Prabowo (2024)	The use of Artificial Intelligence (AI) serves as a tool to support character education by reinforcing moral and ethical values, developing students' critical thinking and decision-making skills, and fostering moral reflection. In addition, AI supports the creation of adaptive and innovative learning experiences and facilitates the integration of character values into the learning process to nurture students who possess integrity and a sense of responsibility.
Strengthening Cultural Identity through Local Wisdom	Pasundan (2024); Ibnu Fitrianto & Muhammad Farisi (2025); Sumartias et al. (2020)	Strengthening cultural identity and character education through the internalization of local wisdom values. The dominant variables include character values, social responsibility, love for the nation, and the utilization of local culture and the environment as contextual and meaningful learning resources.
Integrating Local Wisdom and Artificial	Down et al. (2025); Tobias et al. (2025); Prabowo (2024); Pasundan (2024); Ibnu	The integration of Artificial Intelligence (AI) and local wisdom is a key approach to strengthening character

Intelligence in Character Education	education. Key areas of focus include harmonizing technology and culture, reinforcing moral and ethical values, developing contextual and innovative learning, strengthening cultural identity, and fostering students who are of good character, culturally aware, and responsible.
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Table 1 presents a classification of the research findings into six main areas of focus related to character education based on local wisdom in the era of Artificial Intelligence (AI); These areas include character education based on local wisdom, the integration of AI and local wisdom in character education, challenges in implementing character education in the digital age, strengthening moral and ethical values, reinforcing cultural identity through local wisdom, and the integration of local wisdom and AI in character education. The synthesis results indicate that local wisdom serves as the foundation for shaping students' character, while the use of AI contributes to supporting a more adaptive and innovative learning process. This table underscores the importance of harmonizing technological development with cultural values in efforts to strengthen character education. A more detailed explanation of each research focus is presented in the following discussion section.

1. The Dynamics of Transformation in Character Education Based on Local Wisdom in the Age of Artificial Intelligence

The emphasis on character education reflects a growing focus in educational research (Hindaryatiningsih et al., 2026). Various studies reveal that integrating local wisdom values into the learning process contributes to students' character development through the internalization of moral, ethical, and social values. These findings indicate that local wisdom serves not only as a learning resource but also as a means to strengthen cultural identity and shape students' character (Wijayanti et al., 2025). Thus, character education grounded in local wisdom becomes a strategic approach to addressing social and cultural dynamics in the modern era (Asror et al., 2024).

The application of Artificial Intelligence (AI) in elementary education opens opportunities to provide more adaptive, personalized, and interactive learning experiences. The use of this technology has the potential to support the development of students' critical thinking and decision-making skills (Kitsantas et al., 2019). However, the success of its implementation requires optimal guidance from teachers and parents to ensure that the learning process continues to support character development (Handoko & Sakti, 2023). Furthermore, low digital literacy and the lack of optimal ethical guidelines indicate that the use of AI must be balanced with the reinforcement of moral, cultural, and national values within the educational environment.

Based on the study's findings, character education rooted in local wisdom and the use of Artificial Intelligence (AI) are two elements that can be synergistically integrated to improve the quality of basic education. Local wisdom serves as the foundation of values in shaping students' character, while AI functions as a tool that supports the effectiveness

and innovation of learning. Educational transformation in the digital age must be directed toward a harmonious integration of technology and cultural values in order to produce students of good character, with a strong sense of culture, and who are prepared to face various challenges in the future.

2. Challenges in Implementing Character Education Based on Local Wisdom in the Age of Artificial Intelligence

The challenges in shaping students' character are becoming increasingly complex amid rapid technological advancements and social changes (Badeni & Saparahayuningsih, 2023). Various studies indicate that education plays a crucial role in instilling moral values, integrity, and social responsibility to equip students to navigate the dynamics of modern life. Strengthening character education has become an urgent need to prevent a decline in moral values while fostering behavior that aligns with social norms (Joshi Prem Lal, 2025). These findings underscore that the success of education is determined not only by academic achievement but also by the ability to build students' character in a sustainable manner (Sanjani, 2024).

The application of local wisdom in technology-based learning still faces various obstacles (Siska et al., 2026). Limited access to technology, educators' low competence in integrating local cultural values, and a lack of support for implementation are factors that affect the effectiveness of its implementation (Owston, 2017). Furthermore, the rapid pace of technological development has the potential to divert attention away from character education and cultural preservation if not balanced by appropriate learning strategies (Emier Azka et al., 2025). This situation underscores the need to balance the use of technology with the reinforcement of local cultural values in the educational process.

The study's findings indicate that the challenges of character education based on local wisdom in the era of Artificial Intelligence are not only related to technological aspects but also encompass ethical, social, and cultural dimensions. Although technology offers opportunities to enhance learning innovation, low digital literacy, limited access, and educators' competencies remain obstacles that need to be addressed. Thus, the successful implementation of character education requires a harmonious integration of technology, the reinforcement of moral values, and the preservation of local culture to shape students who are of good character, culturally aware, and responsible.

3. Opportunities for Implementing Character Education Based on Local Wisdom in the Age of Artificial Intelligence

The integration of Artificial Intelligence (AI) into character education opens up opportunities to strengthen students' moral and ethical development (Down et al., 2025). The use of AI can support critical thinking, decision-making, and moral reflection through more innovative and adaptive learning (Kaşaracı et al., 2025). Furthermore, AI enables the integration of character values into various subjects, allowing the process of fostering positive behavior to occur more effectively. However, the use of this technology must be directed toward reinforcing national, cultural, and ethical values to ensure it remains aligned with the goals of character education (Prabowo, 2024). Thus, AI serves not only as a learning tool but also as a means to foster students who possess integrity and a sense of responsibility.

Strengthening cultural identity and local wisdom within the digital education ecosystem is a crucial aspect of addressing the challenges of globalization. Integrating local cultural values into learning can strengthen cultural identity while instilling character traits such as social awareness, responsibility, and love for the nation (Pasundan, 2024). Utilizing local culture and the local environment as learning resources can also create more contextual and meaningful learning experiences for students (Ibnu Fitrianto & Muhammad Farisi, 2025). This situation demonstrates that local wisdom plays a strategic role in preserving the sustainability of cultural values amid the rapid advancement of technology.

The study's findings indicate that Artificial Intelligence (AI) and local wisdom are two components that can complement each other in strengthening character education in the digital age. AI plays a role in enhancing the quality and innovation of learning, while local wisdom serves as the foundation of values in shaping students' character. The success of character education is determined not only by the use of technology but also by the ability to integrate cultural values, ethics, and patriotism into the learning process. A balanced approach between technological innovation and the preservation of local wisdom is a crucial factor in shaping students who are of good character, culturally aware, and responsible.

To clarify the scope and focus of the variables in this study, a systematic mapping of the opportunities for implementing character education based on local wisdom in the era of Artificial Intelligence is presented. This visualization illustrates the interrelationship between the use of AI in learning, the reinforcement of moral and ethical values, and the integration of local wisdom as the foundation for students' character development. This mapping is presented in Figure 1 below

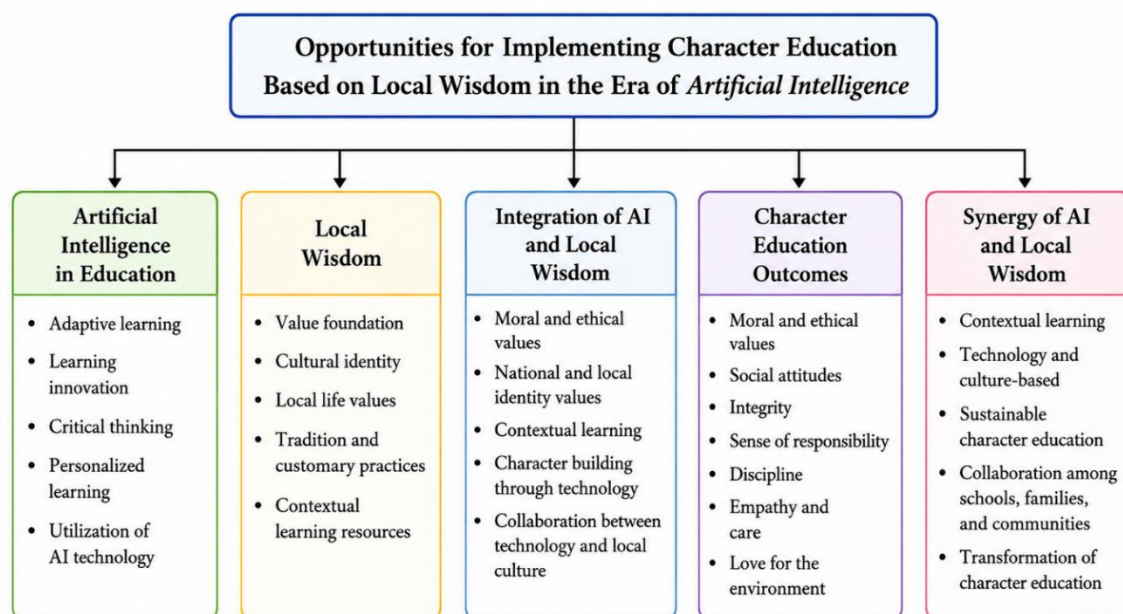


Figure 1. Mapping of Research Variables for Character Education Based on Local Wisdom in the Age of AI

Figure 1 shows the mapping of research variables in a study of the opportunities for implementing character education based on local wisdom in the era of Artificial Intelligence (AI). The variables analyzed include the use of AI in education, which contributes to adaptive and innovative learning, as well as the development of students' critical thinking and decision-making skills. Local wisdom serves as a foundation of values in character education, playing a role in strengthening cultural identity while providing contextual and meaningful learning resources. The integration process between AI and local wisdom is aimed at reinforcing moral, ethical, and national values within adaptive and contextual learning. The outcomes of character education include strengthening students' moral and ethical values, fostering social attitudes such as responsibility and compassion, and reinforcing character built on integrity. Overall, the synergy between AI and local wisdom results in a more meaningful and sustainable learning process that balances technological, cultural, and ethical aspects.

D. CONCLUSIONS AND SUGGESTIONS

Based on the results of the literature review conducted, character education rooted in local wisdom plays a strategic role in shaping students' character amid the development of Artificial Intelligence (AI) technology. The values of local wisdom contribute to strengthening cultural identity, instilling moral values, and fostering positive social attitudes. Meanwhile, the use of AI offers opportunities to improve the quality of learning through more adaptive, personalized, and interactive approaches. However, the implementation of AI in education still faces various challenges, such as low digital literacy, limited teacher competencies, the digital divide, and the potential for a weakening of the internalization of cultural values and character. A balanced integration of technology and the reinforcement of local wisdom is essential so that the educational process is not solely focused on technological mastery but also capable of shaping students who are of good character, culturally aware, and responsible. Future research should focus on developing and testing character education models based on local wisdom that are integrated with artificial intelligence across various levels of education. In addition, studies on strengthening digital literacy and ethical frameworks based on the values of local wisdom are also important to support the use of AI in alignment with the goals of character education.

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