

Educational Leadership in Responding to Artificial Intelligence Disruption

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ABSTRACT

The rapid advancement of Artificial Intelligence (AI) has significantly transformed educational systems, affecting both learning processes and institutional governance. These developments require educational leadership that can adapt to technological change while ensuring that AI implementation remains aligned with educational quality improvement. This study aims to analyze the role of educational leadership in responding to AI disruption using a Systematic Literature Review (SLR) approach. The review examined scholarly publications and policy documents published over the last five years obtained through Google Scholar and official publications from relevant international organizations. The collected literature was analyzed using content analysis to identify major themes and develop a conceptual synthesis. The findings indicate that successful AI implementation in education depends on leaders' ability to establish a digital transformation vision, strengthen AI literacy, promote data-driven decision-making, cultivate an innovation-oriented organizational culture, and implement ethical AI governance. Furthermore, educational leadership in the AI era should integrate human intelligence and artificial intelligence synergistically, allowing technology to support decision-making while preserving human responsibility in strategic leadership. This study contributes a conceptual framework that reinforces adaptive, collaborative, and sustainable educational leadership for addressing AI disruption in contemporary education.

Keywords: *Artificial Intelligence, AI Literacy, Digital Transformation, Educational Leadership, Technological Disruption.*

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1. | INTRODUCTION

The development of Artificial Intelligence (AI) in recent years has brought significant changes to various sectors of life, including education. The emergence of generative AI technology such as ChatGPT, Gemini, Copilot, and various other artificial intelligence-based systems has changed the way information is obtained, developing learning materials, conducting assessments, and supporting decision-making in the management of educational institutions. These changes show that AI is no longer seen as a mere technological innovation, but has become part of an educational transformation that affects the learning process, institutional governance, and the role of education leaders in dealing with increasingly complex changes (UNESCO, 2021; UNESCO, 2023).

The transformation of education triggered by AI disruption presents both opportunities and challenges. On the one hand, AI is able to improve administrative efficiency, support personalization of learning, provide rapid analysis of educational data, and help teachers and students obtain more diverse learning resources (Kaswan et al., 2024). On the other hand, the use of AI also raises various problems, such as the ethics of using technology, personal data protection, algorithm bias, academic integrity, and digital literacy gaps among educators and students. Therefore, the use of AI in education requires responsible governance so that technological innovation remains aligned with the goals of education oriented towards human development as a whole (UNESCO, 2021; Porayska-Pomsta et al., 2023).

These changes demand educational leadership that is not only able to manage the organization administratively, but also has the capacity to strategically direct digital transformation. Education leaders are required to have an adaptive vision to technological developments, the ability to make data-based decisions, and the ability to build an organizational culture that supports innovation without neglecting ethical and humanitarian values (Chigbu & Makapela, 2025). In this context, educational leadership is no longer only focused on supervising the learning process, but also on the ability to effectively integrate AI technology to improve the quality of educational services (Wang, 2021).

In line with these developments, various international organizations emphasized the importance of transforming educational leadership in facing the digital era. UNESCO (2023) emphasizes that the implementation of generative AI in education must be supported by policies that ensure transparency, accountability, data security, and the protection of students' rights. Meanwhile, the OECD (2023) explained that the digital transformation of education does not only depend on the availability of technology, but also on the readiness of leadership in building an innovative, collaborative, and sustainable learning ecosystem. Thus, the success of AI implementation is greatly influenced by the quality of leadership that is able to manage changes systematically.

In addition to the managerial aspect, education leadership also faces challenges in preparing human resources to have competencies that are in accordance with future needs. The Future of Jobs report published by the World Economic Forum (2025) shows that the development of AI will change the characteristics of jobs and competencies needed in various sectors, including education. This condition requires education leaders to encourage the improvement of digital literacy, AI literacy, critical thinking skills, creativity, collaboration, and lifelong learning for educators and students to be able to adapt to changes that are happening very quickly.

Various studies also show that AI is not intended to replace the role of humans in educational leadership, but rather to strengthen decision-making processes through more comprehensive use of data. Wang (2021) suggested that the relationship between education leaders and AI should be built in the form of symbiosis, i.e. AI functions as a support for analysis, while strategic decisions remain with humans. This view is strengthened by Firdaus (2025) who emphasizes that the future of educational leadership will increasingly lead to collaboration between human intelligence and artificial intelligence while still prioritizing ethical, inclusive, and value-oriented leadership in education.

Although the study of AI in education is developing rapidly, most of the research still focuses on the implementation of AI in learning, the acceptance of technology by teachers and students, and the development of AI-based learning systems. Studies that specifically discuss educational leadership in dealing with AI technology disruption are still relatively limited, especially those that integrate strategic leadership perspectives, ethical AI governance, and educational organizational transformation in one conceptual framework. Therefore, this article aims to analyze the role of educational leadership in dealing with the disruption of Artificial Intelligence technology through the synthesis of various current literature so that adaptive, innovative, and sustainable leadership strategies can be formulated in supporting educational transformation in the AI era.

2. | RESEARCH METHOD

This study uses the Systematic Literature Review (SLR) approach to identify, evaluate, and synthesize various relevant research results regarding educational leadership in the face of Artificial Intelligence (AI) technology disruption. The SLR approach was chosen because it is able to produce a systematic, transparent, and comprehensive synthesis of knowledge on the latest research developments so that it can provide a deeper understanding of the concepts, challenges, strategies, and directions of educational leadership development in the era of digital transformation. Through this method, various empirical and conceptual findings that have been published can be integrated into a strong analytical foundation to answer the research objectives.

The literature review process is carried out through several stages which include identification, screening, feasibility assessment, data extraction, and synthesis of research results. The identification stage is carried out by browsing various scientific

publications using the Google Scholar database as the main source of literature search, with the support of official documents from international organizations that have authority in the field of AI education and development, such as UNESCO, OECD, and the World Economic Forum. The search was conducted using a combination of keywords, including educational leadership, digital leadership, artificial intelligence in education, generative AI, AI governance, digital transformation in education, instructional leadership, adaptive leadership, and education and artificial intelligence. The use of these keyword combinations aims to obtain literature that is directly related to the focus of the research.

The inclusion criteria in this study include scientific articles, international proceedings, academic books, and policy reports published in the last five-year period, written in Indonesian and English, available in full text, and having a substance that discusses educational leadership, digital transformation, or the implementation of AI in the context of education. On the other hand, publications published before 2021, do not go through an accountable academic process, have no direct relevance to the research focus, or only discuss the technical aspects of AI development unrelated to educational leadership are excluded from the analysis process. The application of these criteria is intended to ensure that all sources used have a level of relevance, quality, and actuality that is in accordance with the development of science in the current period.

All literature that meets the criteria is then analyzed using content analysis techniques by identifying main themes, grouping concepts that have similarities, comparing research results, and interpreting the relationships between findings critically. The synthesis process is carried out narratively by emphasizing the relationship between the development of AI technology, the transformation of educational organizations, leadership competencies, ethical AI governance, and leadership strategies in dealing with change. Through this approach, this research is expected to be able to produce a comprehensive conceptual picture of the role of education leadership in managing AI technology disruption as well as formulate strategic implications that can be used as a basis for the development of adaptive, innovative, and sustainable educational leadership policies and practices.

3. | RESULTS AND DISCUSSION

The results of the literature synthesis show that the disruption of Artificial Intelligence (AI) technology has changed the paradigm of education management from a conventional administration-oriented approach to a more adaptive, data-based, and digitized system. These changes not only affect the learning process, but also change the pattern of planning, decision-making, performance evaluation, and policy formulation in educational institutions. The presence of AI technology allows various administrative activities that were previously carried out manually to become more efficient through automation, real-time data analysis, and the provision of more accurate information to support the decision-making process. This condition shows that AI has developed into a strategic instrument in supporting the transformation of

educational organizations, not just a technological device used in teaching and learning activities (UNESCO, 2023; OECD, 2023).

This transformation also shifts expectations for the role of education leaders. If previously leadership focused more on administrative and supervisory functions, then in the AI era, education leaders are required to be change agents who are able to direct organizational transformation sustainably. Educational leadership is no longer only measured by the ability to manage human resources and infrastructure, but also by the capacity to build a digital vision, develop a culture of innovation, and ensure that the use of AI provides added value for improving the quality of education (Hu et al., 2023). Thus, the success of digital transformation is not solely determined by the sophistication of the technology possessed, but by the ability of leaders to integrate these technologies into the overall organizational development strategy (UNESCO, 2021; World Economic Forum, 2025).

Literature review also shows that the implementation of AI provides various benefits for increasing the effectiveness of education management. AI-based systems are able to help analyze learning outcomes, identify learners' needs more personally, predict potential academic risks, and present recommendations that support evidence-based policy formulation (Matar, 2025). Through the ability to process large amounts of data, AI can generate information that was previously difficult to obtain through conventional methods, making the planning process faster and more accurate. In this context, education leaders have the opportunity to utilize data analytics as a basis for setting program priorities, evaluating policy effectiveness, and allocating resources more efficiently (Wang, 2021; OECD, 2023).

Nonetheless, various studies confirm that strategic decision-making still cannot be completely left to AI. Technology only serves as a tool that provides alternative information based on available data patterns, while the final decision still requires human considerations that take into account values, social context, organizational conditions, and educational goals. Wang (2021) explained that the relationship between humans and AI in educational leadership should be built in the form of symbiosis, where AI strengthens the leader's analytical capacity without replacing his or her moral or professional responsibilities. This view shows that educational leadership in the AI era remains human-centered leadership by utilizing technology as a support for the decision-making process.

On the other hand, the development of generative AI presents new challenges that have not been faced by the education system in the previous period. AI's ability to automatically generate text, images, program code, and various forms of digital content has changed the way students obtain information and complete academic assignments (Alqahtani et al., 2023). This condition opens up opportunities to increase creativity and learning productivity, but at the same time increases the risk of plagiarism, misuse of technology, decreased critical thinking skills, and dependence on AI systems. Therefore, education leaders are required to develop institutional policies that are able

to regulate the use of AI proportionately so that technology is used as a means of supporting learning, not as a substitute for students' thinking processes (UNESCO, 2023; Porayska-Pomsta et al., 2024).

Ethical issues are one of the most discussed issues in various literature on AI in the field of education. The use of AI involving the collection and analysis of large amounts of data raises concerns regarding the protection of personal data, information security, algorithm transparency, as well as the potential for bias in automated decision-making. UNESCO (2021) emphasizes that the development and use of AI must be based on the principles of respect for human rights, justice, inclusivity, accountability, and transparency. This principle is an important foundation for education leaders in formulating AI governance that is not only efficiency-oriented, but also ensures the protection of all residents of the education unit (Zhang et al., 2025).

In addition to ethical aspects, the readiness of human resources is a factor that greatly determines the success of AI implementation in education. The results of the synthesis show that there is still a digital competency gap among educators and education staff. Most teachers have started using AI to help with the preparation of learning tools, the creation of questions, and the development of learning media, but the level of understanding of how AI works, the validity of the information generated, and its ethical implications still vary widely (Cope et al., 2021). These conditions show that digital transformation is not enough just by providing technological infrastructure, but also requires continuous investment in increasing the capacity of human resources through continuous training, mentoring, and professional development (OECD, 2023; World Economic Forum, 2025).

In this context, educational leadership plays an important role as a driving force of organizational learning culture. Leaders are not only responsible for providing digital facilities, but also creating a work environment that encourages lifelong learning, collaboration, innovation, and openness to change. An adaptive organizational culture will accelerate the adoption of new technologies while minimizing resistance to change. In contrast, organizations that still maintain a bureaucratic leadership pattern tend to have difficulty integrating AI into their work systems because they are less able to respond to changes that take place quickly. Therefore, the success of AI transformation is greatly influenced by the ability of leaders to build shared commitments, manage change, and develop a vision that can be accepted by all education stakeholders (UNESCO, 2023; Firdaus, 2025).

The findings show that AI disruption cannot be seen solely as a technological challenge, but rather as a leadership challenge. Education leaders are required to be able to balance digital innovation with educational values that are oriented towards character development, integrity, and humanity. Thus, the success of AI implementation in educational institutions depends on the ability of leaders to integrate technological advances with ethical, adaptive, and sustainable organizational governance so that digital transformation truly contributes to improving the overall quality of education.

The success of educational leadership in dealing with AI disruption is ultimately largely determined by the competencies possessed by leaders in managing organizational change (Deogaonkar, 2025). The results of the literature synthesis show that leadership competencies in the AI era are no longer limited to administrative and managerial skills, but develop towards leadership that integrates digital literacy, AI literacy, strategic thinking, data analysis skills, collaborative communication, innovation, and ethical-based decision-making. This combination of competencies allows education leaders to respond to changes more quickly without neglecting the main goal of education, which is the development of human potential as a whole. Thus, educational leadership in the AI era is not only oriented towards organizational efficiency, but also on the creation of an adaptive, inclusive, and sustainable learning ecosystem (UNESCO, 2021; OECD, 2023).

One of the competencies that has received great attention in various studies is AI literacy. AI literacy is not only interpreted as the ability to use AI-based applications, but also includes an understanding of how algorithms work, the quality of the data used, potential biases, system limitations, and the social and ethical implications of using the technology. Education leaders who have AI literacy will be better able to determine the scope of AI utilization proportionately, evaluate the reliability of the information generated by the system, and develop policies that are able to minimize the risk of technology misuse. Therefore, increasing AI literacy is an important foundation in supporting more responsible and evidence-based decision-making (Porayska-Pomsta et al., 2024; UNESCO, 2023).

In addition to AI literacy, the ability to utilize data as the basis for data-driven decision-making is also a key characteristic of modern education leadership. AI enables educational institutions to collect, process, and analyze large amounts of data to identify learning trends, evaluate program effectiveness, predict learner needs, and optimize resource utilization. However, the results of AI analysis should be treated as supporting information, not as a sole determinant of policy. Education leaders must still combine the results of data analysis with professional experience, ethical considerations, social conditions, and characteristics of educational institutions so that the decisions made remain contextual and oriented to the interests of students. This view reinforces the concept of symbiosis between human intelligence and artificial intelligence put forward by Wang (2021), namely that AI strengthens analytical capabilities, while humans retain control over strategic decisions.

The rapid change in the educational environment also requires the implementation of adaptive leadership. Adaptive leadership emphasizes the leader's ability to read changes in the environment, anticipate new challenges, manage uncertainty, and drive innovation in an ongoing manner. In the context of AI, adaptive leadership is reflected in the ability to formulate policies that are flexible to technological developments, build an organizational culture that is open to learning, and create evaluation mechanisms that are able to adapt to the dynamics of digital transformation. This approach is

becoming increasingly important considering that the development of AI is taking place much faster than changes in regulations and educational curricula, so educational organizations must have the capacity to continue learning and adapting (World Economic Forum, 2025; Firdaus, 2025).

Literature review also shows that successful digital transformation always begins with the formation of an organizational culture that supports innovation. This culture is characterized by collaboration between educators, openness to new ideas, the courage to experiment, and the commitment to continuous improvement. In such conditions, AI is not positioned as a threat to the educator profession, but rather as a partner that helps improve the quality of educational services. On the other hand, if the organization is still dominated by a bureaucratic work culture that is resistant to change, the implementation of AI tends to face various obstacles even though it is supported by an adequate technological infrastructure. This shows that digital transformation is essentially a process of changing organizational culture led by education leaders, not just a process of adopting new technologies (OECD, 2023; UNESCO, 2023).

In addition, AI governance is becoming an increasingly important aspect of educational leadership. The use of AI needs to be accompanied by policies that regulate the scope of use, personal data protection, algorithm transparency, decision-making accountability, and evaluation mechanisms for the impact of technology use. The governance aims to ensure that AI is used ethically, safely, and responsibly so that it can improve the quality of education without causing risks to the rights of students and educators. UNESCO's recommendations on AI ethics affirm that technological innovation must always be accompanied by respect for human dignity, justice, diversity, and inclusivity so that technological developments remain in line with educational values (UNESCO, 2021).

Based on the overall findings, it can be understood that educational leadership in the era of AI disruption requires a more comprehensive approach than the conventional leadership paradigm. It is not enough for education leaders to only master the administrative aspect, but also to be able to build a vision of digital transformation, improve human resource competence, use data wisely, develop ethical AI governance, and create an innovative organizational culture. All of these components are interrelated and form a leadership system that supports the success of sustainable education transformation.

The synthesis of various literature also shows that there is a consistent conceptual pattern regarding the stages of educational leadership in dealing with AI disruption. This stage begins with the formation of awareness of technological changes (digital awareness), then followed by increasing competence through strengthening digital literacy and AI literacy. Once the basic competencies are established, education leaders need to develop a strategic vision that integrates AI into organizational planning, accompanied by empowering educators through professional training, mentoring, and collaboration. The next stage is the development of ethical AI governance and the

development of a culture of innovation that encourages continuous learning. This series of processes leads to improving the quality of education that is able to adapt to technological developments without eliminating human values as the main foundation of education. The conceptual model shows that the success of educational leadership is not determined by the level of sophistication of the technology used, but by the ability of leaders to manage the interaction between technology, people, organizations, and educational values in a balanced manner.

Thus, the results of the literature synthesis confirm that AI technology disruption is a strategic momentum to reconstruct the educational leadership paradigm towards more adaptive, collaborative, data-based, and ethically-oriented leadership. AI cannot be seen as a replacement for the role of education leaders, but as an instrument that strengthens decision-making effectiveness, organizational innovation, and improving the quality of educational services. Therefore, the success of educational transformation in the AI era is highly dependent on the ability of leaders to develop digital competencies, build responsible AI governance, and foster an organizational culture that is able to adapt sustainably to changes in the strategic environment. These findings also reinforce that future education leadership must integrate human intelligence with artificial intelligence in harmony so that technological innovation continues to support the achievement of human-centered and sustainable education goals (UNESCO, 2023; World Economic Forum, 2025; Firdaus, 2025).

4. | CONCLUSION

The disruption of Artificial Intelligence technology has brought fundamental changes to the implementation of education, not only in the learning process, but also in organizational governance, decision-making, and education policy development. These changes require the presence of an educational leadership paradigm that is more adaptive, innovative, and responsive to technological developments. Educational leadership in the AI era is no longer oriented solely to administrative functions, but has developed into strategic leadership that is able to integrate digital transformation with human values, ethics, and improving the quality of education in a sustainable manner.

The results of the study show that the success of AI implementation in education is greatly influenced by the capacity of leaders to build a vision of digital transformation, improve digital literacy and AI literacy, utilize data as a basis for decision-making, and create a collaborative organizational culture that is open to innovation. In addition, AI governance that upholds the principles of transparency, accountability, fairness, data protection, and academic integrity is an important prerequisite for the use of technology to provide optimal benefits without ignoring the rights and interests of all education citizens.

Based on the synthesis of the literature, educational leadership in the era of AI disruption needs to be understood as a collaborative process between human intelligence and artificial intelligence. AI plays a supporting role as a supporting instrument that strengthens the effectiveness of analysis, planning, and decision-

making, while humans remain the main actors who determine the direction of policy based on professional, ethical, and contextual considerations. Therefore, the development of educational leadership in the future needs to be directed at strengthening digital competence, increasing the capacity to adapt to changes, and developing responsible AI governance so that technological transformation is able to support the realization of a quality, inclusive, competitive, and sustainable education system.

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The data that support the findings of this study are available from the corresponding author upon reasonable request.

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