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Digital Leadership: Transforming School Governance in the Age of Artificial Intelligence (AI)

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A B S T R A C T
The acceleration of the integration of Artificial Intelligence (AI) into the educational ecosystem has created an urgent need to transform conventional governance models. Within the framework of organizational behavior, leadership is no longer merely a managerial function, but a driver of digital transformation that determines institutional effectiveness. This article aims to analyze the role of digital leadership in transforming school governance and to identify the organizational behavior challenges that arise from the adoption of AI in administrative educational environments. This study employs a systematic literature review approach by examining academic sources published between 2021 and 2026. The analysis focuses on the interaction between strategic leadership, digital culture, and data-driven decision-making mechanisms. The findings indicate that effective digital leadership can mitigate organizational resistance to technology through the development of AI literacy and a collaborative work culture. School governance is shifting from a bureaucratic-reactive model to a predictive-adaptive model through administrative automation and advanced data analytics. However, significant challenges remain, particularly in terms of data ethics and the phenomenon of technostress among educational staff, which requires a human-centered managerial approach. The transformation of school governance in the AI era requires synergy between technical infrastructure readiness and the behavioral agility of leaders.

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INTRODUCTION

The development of digital technology has fundamentally changed the way organizations operate, communicate, and make decisions. In the context of education, digital transformation not only impacts the learning process but also significantly impacts institutional governance and leadership patterns (Prince (2018); Sacavem et al. (2025). Educational leaders are now faced with the challenge of adapting to an increasingly digitalized work environment, leveraging data in decision-making, and inspiring change through technology (Maheshwari & Yadav, 2020).

Digital leadership is defined as the ability to use digital technology to strengthen vision, optimize communication, and drive organizational innovation (Tagsherer & Carbon, 2023). Digital leaders act not only as decision-makers but also as change agents, ensuring effective and sustainable digital transformation. In the education sector, this means managing digital-based administrative systems, learning, and organizational culture (Anwar & Saraih, 2024).

Digital leadership transformation has become increasingly relevant post-COVID-19 pandemic. The global crisis accelerated the adoption of technology in educational institutions and demanded a more flexible, collaborative, and results-based leadership model (Sujaya, 2022). Principals and educational institution administrators must now be able to lead remote teams, manage digital systems, and maintain teacher and student engagement in an online work environment. The major challenge lies not solely in the availability of technology, but also in the readiness of human resources and organizational culture to change (Deogaonkar, 2025).

Several previous studies have emphasized the importance of digital leadership in enhancing organizational effectiveness in the era of technological transformation. Arham et al. (2024) found that digital leadership positively impacts the performance and innovation of educational institutions. The implementation of AI allows for increased work efficiency, automation of various complex administrative tasks, and empowerment of data-driven decision-making that is more accurate and faster (Deep et al., 2024; Machkour & Abriane, 2025). Furthermore, AI also contributes to the personalization of learning experiences and supports the emergence of educational leadership that is adaptive to social change and technological advancements (Aprianto, 2024; Attmini, 2024).

ByTherefore, AI not only plays a role as a technological tool, but also as a catalyst in creating strategic, visionary educational leadership that is ready to answer future challenges (George & Wooden, 2023; Langeveldt, 2024; Walela et al., 2025).

One of the most significant contributions of artificial intelligence (AI) to education is its ability to personalize the learning process. Through the use of this technology, learning content can be dynamically tailored to each student's needs, preferences, and learning pace, creating a more relevant and effective learning experience (Duan, 2025; Gocen & Aydemir, 2020).

Overall, artificial intelligence (AI) plays a strategic and multidimensional role in transforming educational leadership and administrative processes within

institutions. If optimally utilized, AI has significant potential as a driving force for institutional innovation, increased governance effectiveness, and strengthened data-driven decision-making in an increasingly complex and dynamic education system (Attamimi, 2024; Onesi-Ozigagun et al., 2024).

LITERATURE REVIEW

Digital Leadership in the Educational Context

Leadership plays a crucial role in realizing digital transformation. Leaders who possess the ability to lead and utilize technology are called digital leaders. The era of information technology development, artificial intelligence, and the use of big data in the education sector will help improve services and accelerate work.

Digital Leadership is not simply the ability to use technical tools, but rather a mindset that guides cultural change amidst technological disruption. According to Hallinger (2023), digital leadership in education is the ability to lead by building an inclusive digital vision, fostering network-based collaboration, and creating an ecosystem that supports innovation.

From an organizational behavior perspective, this leadership shifts from a hierarchical model to a digital transformation model, where leaders act as facilitators who reduce staff anxiety about technology while motivating them to explore the potential of AI in learning.

Artificial Intelligence (AI) in Educational Administration

The rapid development of Artificial Intelligence (AI) technology has created opportunities to address various problems and challenges in educational administration. AI is an advanced technology with the potential to automate tasks, reduce errors resulting from human work, increase the speed of data management, and improve accuracy. According to Nuraida (2023), the utilization of Artificial Intelligence (AI) is considered one of the solutions that can be implemented because AI provides convenience in recording, archiving, reporting, and disseminating activities that are usually carried out manually and require a considerable amount of time.

The integration of AI in schools has evolved from a mere tool to an intelligent system that redefines organizational efficiency. Luckin (2024) divides the role of AI in education into three main categories:

1. Systemic AI: Optimizing administrative governance such as automated scheduling, human resource management, and early warning systems for students at risk of dropping out.
2. Pedagogical AI: Supporting teachers in personalizing learning.
3. AI Analytics: Providing in-depth insights to policy makers through big data.

Artificial Intelligence (AI) has proven to improve the efficiency of educational administration through data management, performance prediction, and resource allocation. However, its successful implementation requires adaptive systems that can respond to changes in policies, technology, and educational needs. Significant challenges include data privacy protection, algorithmic ethics, and resistance to change. The AI models implemented must be flexible, feedback-

oriented, and capable of enhancing efficiency and transparency in educational management. Consequently, AI can support the optimal implementation of educational administration and contribute to achieving high-quality, adaptive, innovative, and inclusive national education goals.

Predictive School Governance Transformation

School governance in the AI era is shifting from a reactive approach to predictive governance. Zhao et al. (2025) suggest that the use of machine learning enables school administrators to predict future trends, both in terms of budgetary needs and achieving national quality standards. This aligns with the concept of organic organizational structure in organizational behavior, where organizations become more flexible and able to automatically adapt to changes in internal and external environmental data.

Schools, as formal educational organizations, are required to adopt adaptive, integrated, and technology-based management systems in order to address the complexities of educational management in the digital era. A School Management System (SMS) is an information technology–based solution designed to support integrated school management. The School Management System (SMS) functions as a primary instrument in managing both academic and non-academic data, including student administration, educators and educational staff management, curriculum management, assessment, finance, and school performance reporting (Wijaya & Risdiansyah, 2020).

Along with the rapid advancement of technology, Artificial Intelligence (AI) has emerged as an innovation with the potential to significantly transform school management systems. AI is a branch of computer science that focuses on developing systems capable of imitating human cognitive abilities, such as learning, reasoning, pattern recognition, and decision-making (Manongga et al., 2022). Zahara et al. (2023) specifically stated that AI is inspired by the reverse engineering of the human brain's neocognitive patterns, emphasizing its objective of replicating human-like cognitive functions through advanced technological systems.

The integration of AI into school management systems or school governance has the potential to improve administrative efficiency through process automation, enhance the accuracy of data processing, and support data-driven decision-making and school management (Kobandaha et al., 2025). Furthermore, AI enables the personalization of educational services, particularly in monitoring student development and planning instruction.

Organizational Behavior and Resistance to Technology

AI adoption often faces psychological barriers within organizations. According to Robbins & Judge (2025), resistance to change can stem from fear of job loss or the inability to learn new skills. Two key phenomena that emerged in the literature review over the past five years are:

a. *Technostress*: Mental stress experienced by educators due to the demands of constantly updating digital skills.

b. *Algorithmic Bias*: Concerns that decisions made by AI may be socially or ethically unjust.

This resistance occurs due to various internal and external factors. Internally, teachers often feel less confident in using technology because of limited digital skills (Ertmer & Ottenbreit-Leftwich, 2010). Externally, conservative organizational cultures and unsupportive leadership further intensify such resistance (Hargreaves & Fullan, 2012). Without cultural transformation and competency improvement, digitalization efforts in schools will struggle to achieve the expected objectives.

In the context of resistance, teachers' perceptions of the benefits of technology also play an important role. Studies indicate that teachers who doubt the effectiveness of technology in improving student learning outcomes tend to be more reluctant to innovate (Howard, 2013; Ifenthaler & Schweinbenz, 2013). In addition, perceptions regarding the increased workload caused by the use of digital technology also become a source of resistance (Hew & Brush, 2007). These perspectives need to be addressed through collaborative and supportive change-management approaches.

The phenomenon of resistance to technology cannot be separated from broader social and cultural contexts. Schein (2010) emphasized that organizational change requires profound cultural transformation. In many cases, resistance arises not only from a lack of skills, but also from the fear of losing professional identity as traditional educators. Therefore, a humanistic leadership strategy is needed to manage the behavior of organizational members so that the digital transition runs sustainably.

Digital Ethics and Quality Standards

The development of digital technology has brought significant changes to modern society, including shifts in values and norms related to the use of technology. The emergence of various digital ethical issues such as hoaxes, piracy, privacy violations, data security breaches, and cybercrime has created dilemmas for society in the digital era. The digital era, characterized by increasing internet connectivity and more advanced technology, also brings risks such as cyberbullying, the spread of misinformation, and the misuse of privacy (Rahmatullah, 2018). Therefore, the importance of digital ethics lies in its role in providing society with the understanding and skills necessary to adopt digital technology with awareness of responsibility and security.

In accordance with UNESCO's 2023 guidelines on generative AI, educational governance in the digital age must be based on ethical pillars encompassing data privacy, algorithm transparency, and human accountability. School leaders are responsible for ensuring that this transformation does not diminish the social interactions that are at the heart of the educational process. The changing dynamics of the digital space highlight the significant importance of adopting digital ethics as a guideline for behavior and communication in the digital world. When digital ethics are neglected, the risks of negative behaviors such as cyberbullying, the spread of fake news, sexual harassment, as well as pornographic content and hate speech, increase significantly. These ethical

principles have been outlined in *Character Education in the Digital Era: How Technology Influences the Formation of Morality and Ethics*, and are also reinforced in Article 27 paragraph 3 of the Indonesian Electronic Information and Transactions Law (UU ITE), which prohibits the distribution or transmission of electronic information or electronic documents that may degrade a person's dignity or damage their reputation.

METHODOLOGY

This research uses a thematic literature review approach to explore and analyze the role of artificial intelligence (AI) in transforming school leadership and governance. This approach was chosen because it allows researchers to systematically examine diverse theoretical perspectives and empirical findings from previous studies and develop a comprehensive conceptual synthesis.

The primary data source for this study was scientific articles published between 2020 and 2025. Articles were collected from various leading databases such as Google Scholar, Scopus, and the Directory of Open Access Journals (DOAJ). The selection process was carried out in three stages: (1) initial identification through searches with relevant keywords such as artificial intelligence, educational leadership, educational administration, and digital leadership; (2) screening based on titles and abstracts to ensure theme relevance; and (3) a full content analysis to assess contributions to the research focus. Only articles from reputable peer-reviewed journals or scientific proceedings were included.

Data analysis was conducted using a thematic-qualitative approach. Text from relevant articles was openly coded and then categorized into recurring themes. Four thematic domains were identified: (1) AI-based learning personalization, (2) administrative efficiency through technology, (3) ethical and policy challenges, and (4) strengthening digital-based educational leadership.

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The primary data sources in this study consisted of published scientific articles. The articles were collected from several reputable databases, such as Google Scholar, Scopus, and the Directory of Open Access Journals (DOAJ). The selection process was conducted in three stages: (1) initial identification through searches using relevant keywords such as *artificial intelligence*, *educational leadership*, *educational administration*, and *digital leadership*; (2) screening based on titles and abstracts to ensure thematic relevance; and (3) full-content analysis to evaluate each article's contribution to the research focus. Only articles from peer-reviewed journals or reputable scientific proceedings were included.

Data analysis was conducted using a thematic qualitative approach. Relevant article texts were openly coded and then categorized into recurring major themes. Four thematic domains were identified: (1) AI-based personalized

learning, (2) administrative efficiency through technology, (3) ethical and policy challenges, and (4) strengthening digital-based educational leadership.

RESEARCH RESULT AND DISCUSSION

Synergy of Digital Leadership and Operational Efficiency

Transforming school governance through AI isn't just about digitizing documents, but rather a fundamental shift in decision-making structures. According to Hallinger & Hosseingholizadeh (2023), effective digital leaders use AI to create Smart School Management Systems. In this era, data is no longer just a static report but a dynamic asset.

AI-based predictive analytics enables principals to identify declines in student performance early before exams take place. From an organizational behavior perspective, this shifts the leader's role from a "firefighter" (reactive) to a "strategy architect" (proactive). Zhao et al. (2025) emphasized that schools that adopted AI in administrative governance reported a 40% increase in efficiency in routine tasks, freeing up space for teachers to focus on emotional and pedagogical interactions with students.

Organizational Culture Transformation: Overcoming Resistance

The biggest obstacle to digital transformation isn't technology, but student behavior within it. Robbins & Judge (2025) state that AI-driven change often triggers fears of losing professional autonomy.

Digital leadership in the AI era must implement a humanistic change management strategy. This is done by:

a. AI literacy as empowerment: Not just technical instruction, but building an understanding that AI is a “co-pilot”, not a substitute for a teacher.
b. Algorithmic Transparency: Leaders must be able to explain how data is used in performance evaluations to build trust in the workplace.
c. Job Redesign: leaders direct staff to shift from repetitive administrative tasks to more creative and collaborative roles.

Strategies to overcome resistance need to consider the continuous development of teachers’ capacities. Training programs that focus on improving digital competence and strengthening technological self-efficacy are highly important (Tondeur et al., 2012). In addition to technical training, it is also essential to provide teachers with opportunities to collaborate in designing digital learning, thereby increasing their sense of ownership toward innovation (Kafyulilo, Fisser, & Voogt, 2015).

Strong digital literacy also serves as a key factor in reducing resistance. Teachers with high levels of digital literacy are more likely to utilize technology to improve the quality of learning (Voogt & Knezek, 2013; Yanti et al., 2024). Comprehensive digital literacy programs should include an understanding of data security, digital ethics, and the use of technology for learning innovation (Howard, 2013; Ifenthaler & Schweinbenz, 2013).

School leadership plays a strategic role in reducing resistance. Visionary leaders who are able to communicate the benefits of technology persuasively and demonstrate the use of technology in daily practices have been proven to increase

acceptance of innovation (Kotter, 2012). A study by Tondeur et al. (2012) showed that the success of digital transformation largely depends on the extent to which principals or leaders can create a collective vision regarding the importance of technology in learning.

Challenges of Ethics and Governance Accountability

One crucial point in the literature discussion over the past five years has been ethical risks. UNESCO (2023) warns that overreliance on AI can lead to bias in assessments. This is where digital leadership plays a role as a moral guardian. School leaders must ensure that any AI-based policies remain aligned with National Education Standards (NES) and protect student data privacy.

Ethics encompasses not only propriety but also accountability. Accountability remains in human hands. Mature digital leadership will not allow algorithms to make final decisions without human review (human-in-the-loop), especially when it comes to sanctioning or student graduation decisions.

Integrating the principles of digital ethics education into educational content and behavior within educational environments is a highly important effort in today's digital era. The integration of digital ethics education concepts into various aspects of the curriculum and ethical norms aims to help students acquire fundamental core values, develop a deep understanding of morality and ethics, and equip them with the tools to apply these ideas in their daily lives.

As cited by Karmila in Satrianawati (2021), curriculum adjustment based on moral principles in education involves a number of interconnected components. At the school level, the policies established should support the integration of moral and digital principles into teaching and learning activities. Schools should also encourage student participation in extracurricular activities to strengthen ethical values and digital skills, including the use of Artificial Intelligence (AI).

CONCLUSION AND RECOMMENDATIONS

The integration of artificial intelligence (AI) into school or educational leadership and governance has become a major catalyst in transforming the structure and dynamics of education systems in the twenty-first century. Based on an analysis of scientific articles, AI plays a crucial role in driving a shift from traditional leadership to a data-driven, predictive, and adaptive approach. This technology strengthens institutions' capacity to manage personalized learning processes, improve administrative efficiency, and accelerate strategic decision-making that is more responsive to student needs and institutional challenges.

Furthermore, AI has proven effective in supporting leadership development and regeneration planning through evidence-based competency mapping and designing interventions relevant to the organizational context. Its ability to process data in real time enables institutions to design more targeted and future-oriented human resource development programs. However, this transformation is not without challenges. Issues related to data protection, algorithmic bias, and unequal access to technology create ethical and structural barriers that require serious and comprehensive policy considerations.

In response, educational institutions need to build an AI integration ecosystem that focuses not only on efficiency and innovation but also upholds the values of fairness, ethical principles, and sustainability. This effort includes strengthening the digital capacity of educational leaders, restructuring institutional policies based on responsible technology governance, and long-term investment in resilient and adaptive information infrastructure.

Based on the analysis of the literature review and discussion, it can be concluded that:

1. Digital Leadership is the Key to Success
   Transforming school governance in the AI era depends heavily on leaders' behavioral readiness to manage disruption. Leaders don't need to be technical experts, but rather visionaries who understand the potential and risks of AI.
2. Paradigm Shift in Governance
   The AI era is transforming schools into predictive, transparent, and personalized governance. This significantly improves administrative efficiency and the quality of data-driven decision-making.
3. Balance of Technology and Humanism
   A successful digital transformation is one that puts humans at the center. Leaders must be able to manage the technostress phenomenon and ensure that AI is used to enhance human dignity within educational organizations.

ADVANCED RESEARCH

This study highlights that AI transforms educational leadership into a data-driven and adaptive system, requiring visionary leaders who can balance technological innovation with ethical responsibility and human-centered values to ensure effective and sustainable governance.

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