THE INFLUENCE OF ARTIFICIAL INTELLIGENCE ON THE DECISION-MAKING PROCESS OF EDUCATIONAL LEADERS

Gjore ANDOV

Postgraduate student,

Faculty of Philosophy, Institute of Pedagogy, Ss. Cyril and Methodius University in Skopje,

Republic of North Macedonia

gjoreandov@yahoo.com

ABSTRACT:

Modern technological development has led to the intensive integration of artificial intelligence in education.The topic of this paper is important, because in such conditions, educational management faces new challenges and opportunities related to the decision-making process.The paper elaborates four aspects: the concept of artificial intelligence in education and management, the decision-making process in the educational and the elements that determine the decision-making process, the role of artificial intelligence in decision-making processes in educational management and the responsibilities of educational leaders in the integration of artificial intelligence.The analysis indicates that the artificial intelligence-based technologies, such as data mining, machine learning and expert systems, enable a more objective and data-based approach to solving complex educational challenges. This increases the accuracy of forecasts, optimizes resources and creates a basis for more informed and strategically oriented decisions.However, the integration of artificial intelligence in educational management is not without limitations. Lack of digital literacy, ethical issues, the risk of bias in algorithms and resistance to change are factors that complicate the application of artificial intelligence.

Keywords: *artificial intelligence, educational management, educational leader, decision-making, technology in education, digital transformation.*

Introduction

In modern society, artificial intelligence (AI) is increasingly integrated into various sectors, including education. Rapid technological development opens up new opportunities for improving educational management, especially in the domain of decision-making. The application of AI tools can significantly transform the way educational leaders analyze data, predict outcomes and create strategies to improve institutional efficiency.Decision-making is one of the key functions of educational management. The quality of decisions made directly affects the functioning of the institution, employee satisfaction, student academic performance and the overall organizational culture. In this regard, the application of AI can offer a new approach to decision-making, based on real data, algorithms and predictive analysis, rather than intuition or previous experience. However, the use of AI in educational management also brings a number of challenges. Issues related to

technological literacy, ethical dilemmas, resistance to change and limited access to resources, are significant factors influencing the way AI is adopted and used by educational leaders.

AI in education and management

AI is the science and engineering of making intelligent machines, especially intelligent computer programs (Turing, 1950).

AI is the science of making machines do things that would require intelligence if done by man (Raphael, 1976).

AI is the study of how to make computers do things that people are better at or would be better at if they could extend what they do to a worldwide web-sized amount of data and not make mistakes (Rich, 1985).

As AI rapidly permeates various aspects of life, it has also began to make profound impacts on education services, solidifying its significance in both educational technology and management sciences (Verma, 2018).

AI has incrementally begun to transform the ways teachers teach, students learn and schools function with inevitable implications for school management and leadership (Turgut Karakose & Tijen Tülübaş, 2023).

AI-powered administrative systems offer educational institutions several advantages, such as reducing operational costs, improving the visibility of revenues and expenditures, and enhancing overall responsiveness. By automating routine administrative tasks, AI allows education managers to focus on initiatives that improve the quality of education (İşler & Kılıç, 2021).

Technological advancement demonstrate that AI has the potential to revolutionize education management by increasing efficiency, improving decision-making and creating more effective learning environments.

Smith (2021 & 2022) outlines several applications of AI in educational management as follows: personalized learning, intelligent tutoring systems, student performance prediction, automated grading, learning analytics, chatbots and virtual assistants, campus safety, recruitment and admissions, financial aid and student services and curriculum development.

Decision-making in education

According to the sociological terminology dictionary, a decision is "a conscious act of the will by which an activity is objectified, an issue is resolved and new activities are undertaken". While a decision is a conscious act or an intellectual instrument for regulating some relationships, decision-making is a kind of process whose goal is the act of making a decision itself. The decision-making process is a complex and responsible task, regardless of whether it is practiced by the manager, as an individual, or the board of directors, as a collective body. In both cases, reaching a quality decision presupposes knowledge of the practical conditions in which the decision is

made and an assessment of the consequences that will be caused by making and implementing the decision.

The elements that determine the decision-making process are diverse and relate to the following: the conditions in which the decision is made (risk, certainty, uncertainty); who makes the decision; the goal that is to be achieved by making the decision; the alternatives when making the decision; the action for choosing the decision; ranking the alternatives and finally, choosing one of the alternatives. According to other opinions, the general elements of decision-making are: defining the problem, formulating alternative courses of action, evaluating the alternatives, selecting the best course of action, executing the decision and controlling it.

The role of AI in decision-making processes in educational management

Educational management is a complex process that requires making strategy decisions and AI plays a significant role in enhancing these decision-making functions. Decision-making in education administration involves considerable responsibility, as it requires analyzing various factors, evaluating data and formulating future strategies. AI technologies have the potential to support educational administrators by providing data-driven insights that facilitate more effective decision-making. At its core, AI technology is designed to mimic human cognitive functions, including learning and problem solving (Syam & Sharma, 2018). The primary objective of AI research is to model the human brain's decision-making processes and drive scientific breakthroughs in this field. Decision-making is one of the AI's central focus areas, aiming to develop systems capable of making and implementing decisions autonomously (Kolbjørnsrud, Amico & Thomas, 2016). AI-based intelligent systems and expert systems, which are designed to collect, analyze and process data, can be effectively utilized by educational administrators to guide decision-making processes (Karaoğlu, 2012; Yağcı, 2018).

One of the key AI-driven techniques supporting decision-making in educational management is data mining. AI provides substantial assistance to educational administrators through data mining, a method that involves analyzing large volumes of data to extract meaningful patterns and trends. The application of data mining and machine learning in educational management is crucial for enhancing efficiency and optimizing resources. Data mining refers to research and analysis processes that uncover significant patterns and rules within large datasets (Göker & Tekedere, 2020). Educational data mining research focuses on various aspects, including identifying student profiles, categorizing students, determining factors affecting student success, predicting graduation grades and providing support to students struggling academically (Özbay, 2015).Baker and Inventado (2014) predict that, in the coming years, all education-related research will incorporate educational data mining or related analytical methodologies. Therefore, AI's integration with data mining is expected to significantly contribute to educational decision-making.

Another AI-based approach to decision-making is the use of expert systems. Expert systems are specialized computer programs designed to simulate the decision-making capabilities of

human experts in specific domains. These systems can perform tasks such as planning, problem-solving and decision-making, relying on structured knowledge storage to assist users in making more accurate and effective decisions (Kodipalli, 2016). AI-powered expert systems support users by providing knowledge-based recommendations, explaining the reasoning behind decisions and helping individuals interpret and understand outcomes (Köse, 2020).

AI has the potential to revolutionize decision-making in educational management by enhancing efficiency, improving data-driven insights and supporting administrators in making informed and strategic decisions. As AI continues to develop, its integration into educational management process will become increasingly essential for optimizing institutional effectiveness and achieving long-term educational goals.

Responsibilities of educational leaders in AI integration

Educational leaders have a critical responsibility in ensuring that AI is implemented ethically and responsibly. This involves addressing several key areas:

- Ethical AI deployment: Leaders must ensure that AI technologies are used in ways that promote fairness, equity and inclusivity. This includes selecting AI tools that are free from bias and ensuring that the data used for training AI models is diverse and representative (Floridi & Cowls, 2019). It is also essential to involve stakeholders, including students, teachers and parents in discussions about AI implementation to ensure transparency and accountability. In sum, education managers should be instrumental in creating inclusive policies and responding to ethical dilemmas that arise in the application of AI.

- Data privacy and security: Protecting student and staff privacy is paramount. Educational leaders must implement stringent data protection measures, such as encryption, secure access controls and regular audits to prevent unauthorized access to sensitive information. Moreover, they must ensure compliance with regulations like the General Data Protection Regulation (GDPR) or similar local laws that govern the handling of personal data (Zawacki-Richter et al., 2019).

- Professional development: As AI becomes more integrated into educational systems, it is essential that educational leaders and staff are trained in the responsible use of AI. Professional development programs should be designed to help leaders understand AI's capabilities, limitations and ethical implications. This will enable them to make informed decisions and manage AI systems effectively (Piety, 2019).

- Monitoring and accountability: To avoid potential harm, AI systems used in education must be regularly monitored for accuracy, fairness and effectiveness. Educational leaders should establish mechanisms for ongoing evaluation and ensure that there is a clear line of accountability for AI-driven decisions (Cath et al., 2018). If an AI system produces undesirable outcomes, leaders must have the authority to override or modify its decisions.

- Implementing ethical guidelines for AI: Educational leaders must develop and enforce comprehensive ethical guidelines for the use of AI in their institutions. These guidelines should address the risks associated with bias, data privacy and transparency and provide a framework for responsible AI implementation. Leaders should also engage stakeholders – including teachers, students and parents – in discussions about the ethical use of AI, ensuring that the institution's AI policies reflect the community's values and concerns (Popenici & Kerr, 2017). Educational leaders are responsible for the responsible use of AI.

- Ethical leadership: Educational leaders must approach AI with a strong ethical framework, ensuring that AI is used to enhance, not replace, human decision-making. Leaders should prioritize the well-being of students and staff and make ethical considerations central to the AI implementation process (Floridi & Cowls, 2019). It is the responsibility of educational leaders to ensure that positive values are equally adhered to in applying AI.

- Fostering transparency and accountability: Transparency and accountability are critical components of responsible AI use in educational leadership. Leaders should prioritize the adoption of explainable AI tools that allow for clear communication of how decisions are made. Furthermore, accountability structures must be established to ensure that AI systems are regularly evaluated and that decision-makers remain responsible for the outcomes generated by AI (Morley et al., 2021). This will help prevent over-reliance on AI systems and ensure that human oversight remains central to decision-making process.

- Promoting data privacy and security: Protecting personal data is a key responsibility of educational leaders in the era of AI. Leaders must implement stringent data protection measures, including encryption, anonymization, and secure storage protocols, to safeguard sensitive information. They should also ensure that AI tools comply with relevant legal frameworks for data privacy, such as GDPR and FERPA (Dignum, 2020). By prioritizing data security, educational leaders can build trust and confidence in the use of AI technologies.

- Supporting professional development in AI literacy: As AI becomes more integrated into educational leadership, it is crucial for leaders to develop a deep understanding of the technology's capabilities and limitations. This requires ongoing professional development in AI literacy, including training on the ethical, legal and practical aspects of AI implementation (Zhu et al., 2023). By improving their AI literacy, leaders can make informed decisions about how to best integrate AI into their institutions while mitigating potential risks.

Conclusion

This paper examines the roleand impact of AI in the decision-making process in educational management, including the ethics of its use.

The application of AI tools significantly transforms the way educational leaders function. These are complementary tools for them and helps them in data analysis and decision-making support. For educational leaders, the benefits of AI are efficiency, predictability and strategic decision-making. However, educational management faces several challenges related to AI technology, such as: ethical dilemmas, the need for competencies and digital literacy. Here, limitations such as lack of resources and resistance to change also appear in the application of AI.

The application of AI can improve institutional efficiency and create support for informed and fair decision-making by educational leaders.Digital and AI competences among educational leaders are not just a technical skill, but a strategic leadership capability, which ensures the efficient, ethical and sustainable functioning of educational institutions in the digital age.

From all this, we could conclude that only through ethical and competent integration of AI, educational leaders will be able to make decisions that advance the equity and quality of education.

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