



Artificial Intelligence Applications in School Administration and their Challenges

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ABSTRACT

The problem of the current research can be identified in the following main question "How to benefit from the applications of artificial intelligence in school administration" and therefore the aim of the research is to explore the applications of artificial intelligence in school administration and its relationship with improving administrative efficiency and to achieve the research goal, the descriptive analytical approach has been used, which is based on the description of artificial intelligence applications in the field of Educational Administration. the results of the research have shown that there is an urgent need for further research to use artificial intelligence applications to harness its full potential in enhancing educational administration. the current research indicated that the integration of artificial intelligence applications in the tasks of educational administration However, there is still a lot to understand about the ethical considerations, privacy concerns , and potential disadvantages of implementing artificial intelligence applications in education, and the research has recommended the need for researchers, policy makers, and educational institutions to cooperate and invest in rigorous research to ensure the application of artificial intelligence tools in an appropriate manner.

Keywords: Artificial Intelligence, School Administration.



Introduction

The last years of the first half of the Twenty-First Century have witnessed great developments in the technological field, which in turn serve various fields and specialties, including the field of education, where it is one of the most abreast of these developments, and among these scientific developments is artificial intelligence, which appeared in the Fifties of the last century, which is considered a major turning point in human history due to

Artificial intelligence has revolutionized education due to its many benefits and its ability to increase the efficiency and effectiveness of managers, teachers and students if used properly

Artificial intelligence is a field of study where agents can perceive the environment and make decisions (Jordan, M.I.; Mitchell, T.M2015). In this case, computers perform cognitive functions similar to human ones taking into account the ways of learning, understanding, thinking and interacting (Tao, F.; Qi, Q.; Wang, L.; Nee, A2019). Various methods and algorithms are used in product development and various forms of data analysis. To improve the efficiency of operations, artificial intelligence methods help in decision-making, simplify the process of analyzing information, make it more flexible, even with abundant amounts of data. In this sense, it is believed that the use of AI-powered actions is crucial to promote economic growth.

Hence the importance of studying artificial intelligence applications in the field of educational administration with its various processes and improving its productivity

The problem of research and its questions

Artificial intelligence applications have gained great interest in various fields, including educational management. As technological advances continue to reshape the educational landscape, artificial intelligence has emerged as a powerful tool that can support decision-making processes and enhance various administrative tasks, according to Hwang, G. J., Xie, H., Wah, B. W., & Gašević, D. (2020). , Artificial intelligence systems are designed to analyze data, provide customized learning experiences and automate administrative functions. Moreover, the ability of artificial intelligence to bring about changes in educational management processes has been recognized all over the world (Aisami et al., 2020)

The problem of the current research can be crystallized in the following main question "How to benefit from artificial intelligence applications in educational administration" where this question can be divided into a number of the following sub-questions

1. What is the theoretical framework of artificial intelligence and its importance in educational administration?
2. What are the most important administrative tasks based on artificial intelligence?
3. What are the benefits of artificial intelligence applications in educational management?



4. What challenges and limitations do artificial intelligence face in educational management?

Research objectives

This research aims to explore the applications of artificial intelligence in educational management and its relationship to improving administrative efficiency

Research methodology

To achieve the research goal, the descriptive analytical approach was used, which is based on the description of artificial intelligence applications in the field of educational administration

The current research is proceeding according to the following steps

i. The importance of artificial intelligence in educational administration

Artificial intelligence can be defined as the simulation of human intelligence in machines programmed to think and learn like humans. According to Russel and Norvig (2016), artificial intelligence involves the development of computer systems that have the ability to perform tasks that would normally require human intelligence, such as problem solving, decision making and understanding natural language. Such systems are designed to imitate human cognitive abilities, adapt and improve their performance based on experience and feedback. Artificial intelligence has the potential to revolutionize many areas, by providing intelligent systems that can help with educational management tasks.

According to Jennifer Parker, 2021, artificial intelligence is a combination of technologies that analyze records, make assumptions, test, and retest data independently. Complex algorithms process huge amounts of data in real time without predefined rules, allowing the program to automatically identify data trends and learn from them. This machine learning process is constantly re-evaluating models and data to accurately predict results on a large scale and at speeds that human analysts cannot achieve.

Therefore, artificial intelligence has become increasingly important in various fields, including education management by performing a number of tasks such as analyzing student performance, personalized learning and administrative processes. According to (2020) s Hutt, C Mills, S White, artificial intelligence can analyze large amounts of data to identify patterns and provide insights that can improve decision-making in educational environments. Moreover, artificial intelligence can support individual education by adapting to the unique needs and preferences of students (Valentin Joseph et al., 2023) Valentine Joseph. In addition, artificial intelligence can automate administrative tasks, allowing teachers to focus more on educating and guiding students (S Hutt, C Mills, S White, 2020 in general, AI applications in education have the potential to revolutionize the way educational institutions are managed and improve student outcomes.



Artificial intelligence has emerged as an important tool for Educational Management, revolutionizing and simplifying various administrative processes. In terms of enabling educational institutions to collect and analyze large amounts of data, facilitating evidence-based decision-making and personalized learning experiences (Wang et al., 2020). In addition, AI-powered chatbots and virtual assistants improve student support services by providing immediate responses and guidance, and improve overall student satisfaction (A. Bhharathee 2023). Moreover, artificial intelligence has the potential to transform assessment practices by automating grades and providing personalized feedback, saving teachers time while maintaining fairness and accuracy (Chiawa Igbokwe 2023,). The importance of artificial intelligence in educational management lies in its ability to enhance efficiency and effectiveness in educational institutions.

In recent years, the application of artificial intelligence in educational management has gained great attention due to its ability to enhance learning experiences and improve administrative efficiency. For example, AI-powered chatbots, such as the Jill Watson developed by Georgia Tech Georgia Tech, have been used to provide personalized support and quick responses to student inquiries. This not only reduces the workload of instructors, but also ensures that students receive timely assistance. In addition, artificial intelligence algorithms can analyze large amounts of educational data to identify patterns and provide insights for better decision-making. This can be seen in the case of AI-based predictive analytics tools that help institutions identify at-risk students and intervene early to improve retention rates (Yun, P., Shun, M., Junta, U., & Browndi, I. (2022).

ii. The importance of artificial intelligence applications in educational management

The use of artificial intelligence applications in Educational Management provides many benefits. One of the main advantages is the mechanization of administrative tasks, which allows managers to devote more time to educational activities. In addition, AI-based educational technologies can provide teachers with data analytics and insights that help them identify areas for improvement and improve their teaching strategies (Kabudi, T 2021. Ultimately, the integration of artificial intelligence into educational management can lead to greater efficiency and effectiveness in the learning process. This is done through the following

1--simplification of administrative processes

Simplified administrative processes in educational institutions can be significantly enhanced by the implementation of artificial intelligence applications. According (Chiawa Igbokwe 2023, artificial intelligence has the ability to automate routine administrative tasks such as student registration, scheduling and grades, which not only improves efficiency, but also saves valuable time for teachers to focus on more meaningful activities. Similarly

Mandernach, P. J., Gonzalez, R. M., & Garrett, A. L. (2020) discuss that artificial intelligence can also contribute to data analytics and predictive modeling, enabling educational leaders to make data-driven decisions that ultimately improve overall



institutional performance. It is clear that AI applications have significant implications for educational management, especially when it comes to streamlining administrative processes and enhancing decision-making capabilities.

(Jennifer Parker,2021) defined predictive analytics as a statistically based method used by data analysts to make assumptions and test records in order to predict the probability of achieving a certain future result. Analysts pick up historical trends, apply these patterns to current data, and later calculate a specific value. However, the data must be retested manually on an ongoing basis to get up-to-date predictions.

2. Save time and cost

In recent years, the adoption of artificial intelligence in educational management has led to many benefits, including time and cost savings. Artificial intelligence algorithms and machine learning techniques have been used to automate administrative tasks such as data entry, scheduling and grading, thereby reducing the time and effort required for managers and teachers (McKenna, S. (2021).). Moreover, AI applications have the potential to simplify processes and optimize resource allocation, resulting in significant cost savings for educational institutions by making use of AI technologies, educational management can focus more on strategic decision-making and student support, resulting in improved efficiency and effectiveness Mandernach, B. J., Gonzales, R. M., & Garrett, A. L. (2020)

3. Efficient resource allocation

The effective allocation of resources plays a crucial role in Educational Management, in particular in the implementation of artificial intelligence applications. Through artificial intelligence and machine learning algorithms, educational institutions can optimize and distribute resources such as time, personnel and funding, which leads to improved decision-making processes and improved educational outcomes (UNESCO.2021). Moreover, AI-powered tools can automate administrative tasks, saving valuable time for teachers and administrators to focus on high-level tasks that require human expertise. efficient resource allocation combined with AI applications not only simplifies educational management, but also allows learning experiences to be customized to meet the evolving needs of individual students Wayne Holmes, et al (2022)) ultimately, AI's ability to efficiently allocate resources contributes to the overall effectiveness and success of educational institutions

4. Data - driven decision making

Data - driven decision-making refers to the process of using data and data analysis to inform and improve decision-making in various fields. In the context of Educational Management, Data-Driven Decision-Making can help administrators and teachers make more informed choices about curriculum development, resource allocation, and Student Support Services. By examining data such as student performance, attendance, and feedback, educational leaders can identify areas for improvement and implement evidence-based strategies to enhance student outcomes (Emine Doğan, Ayşe Ottekin Demirbolat, 2021). In addition, through the use of data analysis tools and techniques, officials can monitor and evaluate the effectiveness of their decisions, which allows for continuous improvement and evidence-based decision-making (Hamilton, L., Halverson, R., Jackson, S., Mandinach, E., Supovitz, J., & Wayman, J.



(2009).). In General, Data-Driven Decision-Making in Educational Management Allows administrators and teachers to make informed, evidence-based choices, which leads to improved student achievement and educational outcomes.

iii. Administrative tasks based on artificial intelligence

Artificial intelligence applications in Educational Management hold great promise for improving the administrative process in terms of data analytics in educational management facilitates timely and informed decision - making by analyzing large data sets on Student Performance, Participation and progress. These apps have the potential to enhance the educational experience by improving instruction, supporting student-centered learning, and enabling data-informed decision-making.

One example of AI-driven administrative tasks in educational management is the use of chatbots. Chatbots are computer programs that can simulate human conversation, provide instant and personalized responses to inquiries. They can be used to automate administrative tasks such as answering frequently asked questions, providing information about registration processes, or helping schedule appointments. Chatbots have been found to enhance efficiency and improve user satisfaction by providing round-the-clock support and reducing the need for human intervention (Lin, C.-C,2023). Therefore, the deployment of AI-based chatbots in educational management is a promising development that has the potential to simplify administrative processes and enhance the student experience.

However, there are also restrictions on the use of chatbots. Some users may find interactions to be artificial or impersonal, and there is a risk that chatbots may not be able to fully understand or respond to more complex or accurate inputs. In this case, some researchers have proposed a new way to recognize the emotions of clients during conversations, such as happiness, anger, sadness, fear, neutral states. Thanks to customer feedback, the percentage of chatbots taking the right actions has increased significantly, thereby improving the key performance indicators for improving customer service (, 2022pawlik, Ł.; Płaza, M.; Deniziak, S.; Boksa) and AI-based administrative tasks can be listed below: -

1. Automated student registration and scheduling

Automated registration and scheduling of students is an essential aspect of educational management that can greatly benefit from the implementation of artificial intelligence. According to research by De Souza and others, AI systems can simplify the enrollment process by analyzing student data, such as academic transcripts and preferences, to suggest appropriate courses. Them. Moreover, artificial intelligence algorithms can efficiently create customized schedules for students, taking into account various factors such as course availability, time constraints and prerequisites. Through the use of artificial intelligence in student registration and scheduling, educational institutions can enhance administrative efficiency and facilitate student success. (De Sousa zanerato Maya, C.; Bueno, EBA; Sato, Jr 2023)

2. Data analysis and Decision Support

Data analysis plays an important role in educational management, as it enables decision makers to make informed choices based on evidence rather than intuition. AI applications have been used to enhance data analysis in education, providing decision-



making support through advanced algorithms and machine learning techniques. These applications are capable of processing large amounts of data, identifying patterns and trends, generating ideas that can guide effective decision-making the integration of artificial intelligence into data analysis not only improves the efficiency and accuracy of decision-making processes, but also allows educational institutions to optimize resource allocation and Student Support strategies Mandernach, B. J., Gonzales, R. M., & Garrett, A. L. (2020) thus, educational management can greatly benefit from the use of artificial intelligence for data analysis and Decision Support.

3. Predictive analytics of student success

In the modern educational landscape, the ability to predict and understand the performance of students and teachers is extremely important. It not only provides teachers with valuable insights on learning styles, but also allows students to identify areas for improvement, and promote a favorable learning environment Rui, Y., Chen, G., & Cui, W. (2020).

Many scientific investigations have examined diverse aspects of student performance. However, rapid improvements in machine learning are introducing a new point of view, carrying the ability to make more accurate forecasts. Forecasting student performance and academic analyzes of students are one of the most demanding research topics in the field of educational literature. Despite having diverse goals, performance analysis has a significant impact on forecasting research. Learning analytics, by popular definition, is the process of collecting and analyzing information about students and their surrounding environment with the aim of improving both (Siemens, G.J, A2020. If this predictive analysis benefits teachers, then it can be used by the administration in analyzing the performance of school staff of teachers and administrators, where the use of predictive analytics in educational management can enable institutions to make data-informed decisions and provide targeted support to students and teachers, leading to the achievement of educational goals.

iv. Challenges and obstacles facing artificial intelligence applications in educational administration

The uncertainty in the development of artificial intelligence brings new challenges. Artificial intelligence is a destructive technology with a large-scale impact. It may lead to problems such as changing the structure of employment, influencing social laws and ethics, invading personal privacy, challenging the norms of international relations. It will have far-reaching consequences for government administration. Economic security, social stability, and even global governance. While we are vigorously working on the development of artificial intelligence, we must attach great importance to the challenges of potential security risks, promote forward-looking guidance for prevention and self-control, reduce risks, and ensure the safe, reliable and controllable development of artificial intelligence. (China State Council. (2017).)

The development of AI applications for educational management raises important ethical considerations, one of the main concerns is to ensure that AI systems are designed and used in a way that respects the privacy and autonomy of students and teachers. The most important ethical considerations are the following

1. Privacy and data security concerns



Artificial intelligence systems often require access to large amounts of data, including personal and sensitive information. Ensuring the privacy and protection of data becomes crucial for maintaining the privacy of individuals and organizations (Boland, H. (2018).)

Privacy and data security concerns are important when it comes to AI applications in educational administration. With the increasing use of artificial intelligence technologies, such as machine learning and data analytics, there is an increasing amount of personal data being collected and processed. This raises concerns about protecting the privacy of students and the security of their information. In addition, the integration of artificial intelligence into educational management systems also poses the risk of data hacking and unauthorized access to sensitive student data (Ahmed and Nashat, 2020)) as digital security is one of the most important risks and ethical concerns of using artificial intelligence in education systems, as criminals hack devices and sell data for other purposes (Mhlanga D (2021)). Therefore, it is essential for educational institutions to implement strong security measures and privacy policies to protect student data and appropriately address these concerns.

2. Transparency and accountability issues

Issues of transparency and accountability are major concerns when it comes to the use of artificial intelligence in educational management. As AI technologies advance and are integrated into educational systems, it is critical to ensure transparent and accountable decision-making processes and outcomes. This means that the algorithms used in AI systems must be interpretable, and the data used to train these algorithms must be unbiased and representative, as stakeholders need to understand how decisions are made and be able to challenge them if necessary. In addition, it is crucial to hold educational institutions and AI developers accountable for any possible biases or discriminatory practices that may arise from the use of AI in educational administration (Niklas Kossow, Svea Windwehr and Matthew, (2021)). In general, addressing issues of transparency and accountability in AI applications is critical to ensuring fair and equitable educational practices.

3-dispensing with the human element in administrative work:

The integration of artificial intelligence technologies into management may lead to job displacements and changes in the workforce landscape. This raises concerns about unemployment, skills gaps, and the overall well-being of workers. At the first artificial intelligence conference at Dartmouth College in 1965, Nobel laureate Herbert Simon predicted that "machines will be able, within 20 years, to do any work that a man can do." (Mitchell 2021).

When the use and dependence of artificial intelligence is increased, it will automatically limit the ability of the human mind to think. This leads to a rapid decrease in the human ability to think. Another problem is the human dependence on artificial intelligence technology in almost every walk of life. There is no doubt that it has improved living standards and made life easier, but it has affected human life miserably and made man impatient and lazy Ghosh B, Daugherty PR, Wilson HJ (2019) which leads to depriving the human mind of thinking with deteriorating



professional skills and generating stress when mental measures are needed (Gocen and Aydemir, 2020).

4-Automated decision instead of human decision

Technology plays a fundamental role in decision-making. It helps a person to use information and knowledge correctly to make appropriate decisions for his organization and innovations (Ahmad, 2019). Where man is doing the terrible production of knowledge and information, and to make that data valuable, he is using artificial intelligence, where humans believe that they are getting benefits and saving time by using artificial intelligence in their decisions. But it detracts from the biological capabilities of man through a decrease in cognitive abilities (Jarrahi, 2018). Artificial intelligence limits and replaces the human role in decision-making. Human mental abilities such as analysis, critical thinking and creative problem solving emerge from the decision-making process (Ghosh et al., 2019).

Most global universities rely on the role of artificial intelligence in decision-making in academic and administrative activities. Starting from students who are looking for admission requirements to the program and up to obtaining scientific degrees (Karandish, 2021).

In **conclusion**, there is an urgent need for more research to use artificial intelligence applications to harness its full potential in enhancing educational management as the current research indicated that the integration of artificial intelligence applications in various educational management tasks has shown promising results in increasing the efficiency of the administrative and educational process however, there is still a lot to understand about ethical considerations, privacy concerns , and potential disadvantages of implementing artificial intelligence applications in education. therefore, it is necessary for researchers, policy makers, and educational institutions to cooperate and invest in rigorous research to ensure responsible and effective use of artificial intelligence in management Educational.

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