



INTEGRATION OF ARTIFICIAL INTELLIGENCE IN EDUCATIONAL MANAGEMENT

¹ Olubunmi Helen Olatunde

² Hembadoon J. Yoosu

&

³ P.N. Mando

¹⁻³ Department of Educational Administration and Planning
Joseph Sarwuan Tarka University Makurdi, Benue State
olubunmihelen195@gmail.com

Abstract

Artificial Intelligence (AI) is rapidly changing the world and education. It has the potential to transform the way educational institutions operate, making them more efficient, effective, and student-centered. This study explores the concepts of AI in Educational management. The study explore the current state of AI adoption in educational management, the role of AI in school management highlighting the relevance , Data driven decision making, automated administrative tasks, resource allocation, school safety and security and strategic planning to mention a few. A comprehensive review of existing literature reveals that AI can assist school leaders and enhance educational management in various ways, including automating administrative tasks, personalizing student learning, assist resource allocation, strategic planning, facilities management, student behaviour and discipline monitoring, crisis management, parent and community engagement and data driven decision making. However, the study also identifies some challenges, such as data privacy concerns, ethical consideration, depersonalization of learning, cost and funding, and AI decision-making could be bias. To address these challenges, the study suggested that continuous training and development for handlers and propose that the government should invest in line with UNESCO into education. The study concludes that AI has significant capacity to improve administrators and educators activities.

Keywords: *Integration, Artificial Intelligence (AI), Management, Educational Management*

Introduction

The education sector is on the verge of a revolution, driven by the rapid advancement of Artificial Intelligence (AI) technologies. As AI continues to transform all aspect of lives, its potential to enhance educational management is vast and exciting. Educational management, which encompasses the planning organization, and supervision of educational institutions, is a complex and multifaceted field that stands to benefit significantly from the integration of AI. Integration of Artificial Intelligence (AI) in educational management has the potential to transform the way educational institutions operate from automating administrative tasks to enhancing student learning outcomes (Kumar et al., 2022). Artificial Intelligence is often used as a generic term that refers to a collection of several digital technologies such as machine/deep learning, data mining, natural language processing, and neural networks, all of which serve the purpose of creating computing systems that can perform human-like processes like cognition, sensing, synthesis, and understanding of large data in order to solve complex problems (Baker & Smith, 2019). AI can be used to improve student outcomes, enhance teacher productivity, and optimize educational resources. As the world moves further into

the twenty-first century, the integration of Artificial Intelligence (AI) into the management of education has become necessary (Akinyemi, et al., 2022). The introduction of AI has revolutionized the way to manage educational activities. It focused on several core components of modern educational management which involves automated administrative tasks, improved students' services, and learning outcomes.

In a study conducted, AI has presented for the first time in education to cater into intelligent and personalized learning system that work in progress to meet the much needed efficiency in education (Wadhvani & Bhutani, 2018). AI has been integrated in educational management as shown in the adopted diagram below, showing the interface of Artificial Intelligence (AI) in educational management.

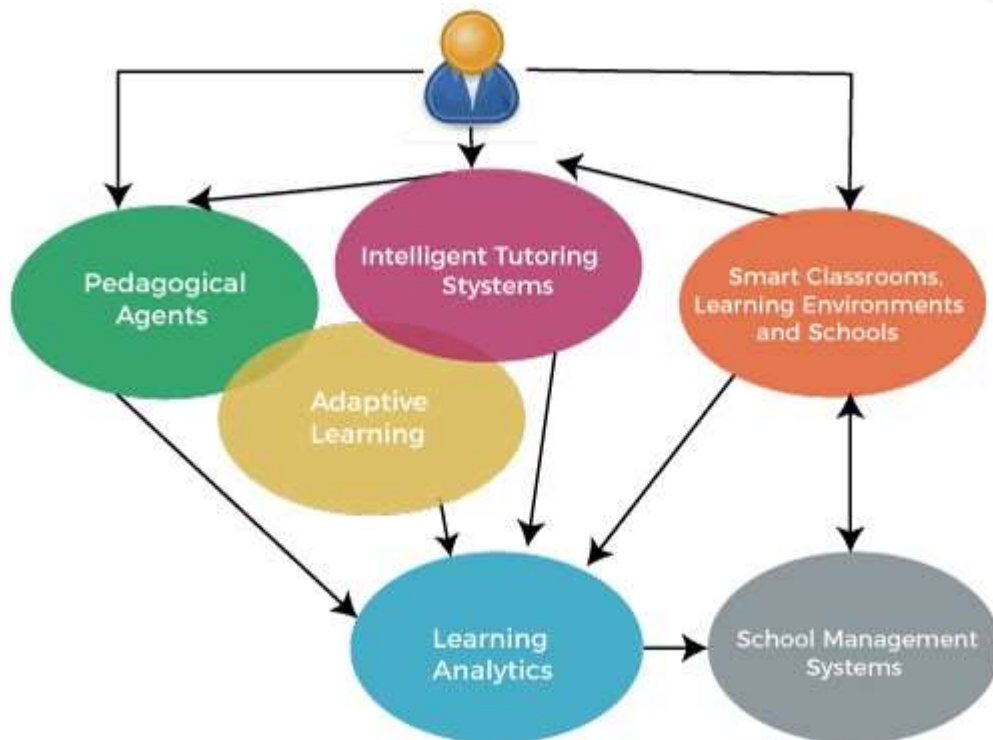


Fig. 1: Source: Adopted from online (Edtech solution provider Oct. 2, 2023)

From the diagram, the AI is directly at the top creating different experiences as pedagogical agents, as intelligent tutoring systems providing personalized guidance and feedbacks to students. Adaptive learning, smart classrooms, learning environments and schools interfacing with school management systems.

Concept of Educational Management

The success of AI in Educational management centers on leadership. Management is said to be the guidance or direction of people towards accomplishment of the educational goals (Ogbonnaya, et al., 2013). In the same vein, Bua (2020) conceive management to include proper planning, organizing, directing, supervising for optimal performance. Ogbonnaya (2009) defined educational management as the planning and formulation of educational policies or programmes with the view to achieving educational goals. Akpakwu (2008) viewed educational management as the ability of the educational manager to judiciously utilize human, material, financial and time resources towards the efficient and effective achievement of the objectives of educational institutions. In the same vein, Educational management is said to involve the effective use of resources, including human, financial, and physical resources, to create a supportive learning environment that promotes student achievement and well-being (Hallinger, 2018). It can therefore be said that educational management is concerned with ensuring that educational institutions run efficiently and effectively to provide quality education to students. Bush and Glover (2014), maintain that educational management is a crucial field of study that helps educational institutions to meet their goals and objectives. The author further state that effective educational



management requires the use of appropriate management techniques and tools, such as strategic planning, administrative tasks planning, and financial management. The success of the techniques anchored on management leadership abilities. Igbokwe (2023) opines that effective leaders create a vision for the institution, establishes clear goals and objectives, develop and support a talented staff, and create a positive school culture.

The authors opine that the integration of AI to educational management is still in the teething stage but has great prospect. Some institutions have employed AI intelligent system called answering machines for giving feedbacks to applicants, intelligent tutoring systems provide individualized support for learners, automated grading, feedback and planning programmes. However, the integration of AI has raised some biases and discrimination, hence, the need for careful examination of integration of AI in educational management.

Concept of Artificial Intelligence (AI)

Artificial intelligence (AI) is creating quantum waves in almost every field including education. It is an evolving technology that tries to simulate human intelligence using machines especially computer systems. AI has several subfields and methods, such as machine learning, robotics, natural language processing, computer vision, and expert systems. Each of the subfield focuses on different aspects of AI technology. Artificial Intelligence (AI) also known as 'machine intelligence' involves designing devices that resemble cognitive processes such as answering machine, learning, problem-solving, decision-making and modeling of human intellect. Vijay (2022) defined AI as the intelligence of a machine or computer that enables it to imitate or mimic human capabilities. Baker and Smith (2019) also viewed AI as computers performing cognitive tasks. In recent time, technology is rapidly transforming various sectors and education is not left out. Technologies are being introduced into the management of education in order to help enhance the learning process, improve students' outcomes and administrative tasks. Educational management is gradually shifting from the traditional method of how the educational system was being managed to a technological approach.

AI has revolutionized the way to teach and learn and ways of doing things. As every sector of education strives to prepare future generations, it has become increasingly evident that traditional pedagogical approaches may no longer be sufficient. Traditional pedagogy refers to face-to-face teaching environment and the conceptual framework around how people learn in that particular space, however, the 21st century pedagogy simply aims at developing the skills and knowledge students would need to succeed and the skills could be applied in all facet of life.

Technology has provided exciting opportunities to enhance the educational experience and prepare students for the digital age with the use of devices like computers, tablets and interactive whiteboards. Students can access a wealth of information, collaborate with peers and engage in interactive learning activities. The success of the technologies in education hinges on its management which requires proper coordination, overseeing and organizing the system. It involves making sure that the system is sustained.

Roles of Artificial Intelligence (AI) in School Management

Artificial Intelligence (AI) has become crucial in school management because it can offer several opportunities to transform various tasks in institutions of learning. Schools management employs the assistance of AI intelligent tutoring systems which involves the use of computer programs to provide data and personalized instruction to students. AI can be used for personnel time monitoring in institutions among others that will be discussed. AI personnel time monitoring refers to the use of AI technologies used to track and monitor the time spent by employees on tasks, projects and activities (Rao, 2022). This includes automated time tracking, attendance monitoring, and performance analysis. It enhances resource allocation, strategic planning, facilities management, student behavior and discipline monitoring, crisis management, parent and community engagement, staff performance evaluation, policy compliance support, teaching and learning experiences, personalized learning, curriculum development, students' assessment and evaluation,. According to Aigerim et



al., (2018), AI is characterized by widespread of technology and increased global connectivity and that has extended to educational management, to include:

- i. **Resource Allocation:** AI can help schools optimize resource allocation by analyzing data on student enrolment, teacher workload, and facility usage (Kumar, et al., 2022) AI-powered systems can help schools identify areas where resources can be reduced or reallocated, leading to cost savings and improved efficiency.
- ii. **Strategic Planning:** AI can assist schools in strategic by analyzing data on student performance, demographic trends, and educational outcomes (Luckin, 2020). AI-powered system can help schools identify areas for improvement and develop data-driven strategies to address them.
- iii. **Facilities Management:** AI can help schools manage their facilities more efficiently by analyzing data on energy usage, maintenance needs, and space utilization (Williamson, 2020). AI-powered systems can help schools optimize their facilities for better learning outcomes and reduce costs.
- iv. **Student Behaviour and Discipline Monitoring:** AI can assist schools monitor student behavior and discipline by analyzing data on student attendance, grades, and disciplinary incidents (Mishra & Koehler, 2020). AI-powered system can help schools identify early warning signs of student misbehavior and develop targeted interventions to support such students.
- v. **Crisis Management:** AI can help schools respond to crises more effectively by analyzing data on emergency response plans, student safety, and crisis communication (Bakia et al., 2020). AI powered system can assist schools to develop personalized crisis response plans and provide real-time support to students and staff during emergencies.
- vi. **Parent and Community Engagement:** AI powered systems can assist schools engage with parents and community more effectively by analyzing data on parent involvement, community outreach, and social media engagement (Siemens, 2020). AI systems can help develop personalized communication plans and provide real-time updates to parents and the community.
- vii. **Staff Performance Evaluation:** AI can help schools evaluate staff performance more effectively by analyzing data on teachers' effectiveness, students' outcome, and professional development (Mishra & Koehler, 2020). It can help schools identify areas for improvement and develop targeted professional development plans to support staff.
- viii. **Policy Compliance Support:** AI can assist schools to comply with policies and regulations more effectively by analyzing data on policy requirements, compliance metrics and risk assessment (Williamson, 2020). It can help schools to identify areas of non-compliance and develop targeted plans to address them.
- ix. **Personalization of Learning:** AI can help in creating personalized learning experiences for students by analyzing their learning styles and abilities. This will allow educators to customize their teaching methods to meet the individual needs of each student.. AI can analyze teachers' performance, identify areas for improvement and offer specific resource and strategies to meet the needs of their group of students. (Baker & Smith, 2019) this also allow educators to adapt their approach and provide more effective and meaningful teaching. AI helps educational management in creating customized learning experiences which is tailored to individual students' needs, abilities, and learning styles. This is supported by Singh, Nahar, and Kumar (2021). AI powered systems analyses student data, learning patterns and performance to recommend personalized contents, activities, and resources.
- x. **The AI powered have provided intelligent tutoring system:** The intelligent tutoring system provided one-on-one support to student especially in subject like mathematics and science (Chi, et al., 2011). The



integration into the educational sector has revolutionized its entire educational community from the way students engage with knowledge to how academic institutions have embraced AI tools to achieve efficiency in their process among other benefits stated (Chi, et al., 2011).

- xi. The integration of AI in educational management enhance automated grading:** Reductions of administrative burden often have overwhelming relevance. AI powered system can reduce errors and increase accuracy; freeing educational managers from tedious grading tasks and saves time (Santos, et al., 2019).
- xii. AI support in learning assessment and data driven:** AI is an excellent ally in assessing student progress with the ability to analyse large amount of data. According to Baker and Siemen's (2014) AI is data driven to inform educational decision making and provide detail information about student performance which allows educators to identify those who need additional support and develop specific teaching strategies.
- xiii. Student engagement and educational resources:** AI powered tools can make learning more interactive and engaging. Diche and Dicheva (2017) stressed that AI is also revolutionizing the creation of resource helping educators design engaging personalizing learning materials. Additionally, these tools can stay updated with the latest advancement in their field ensuring they have access to high quality content.
- xiv. Improve accessibility and students outcomes:** AI-power tool help make learning more accessible especially for student with disabilities (Kurzweil, 2013). Kurzweil further stressed that AI does not only improve student outcome but could also help identify student at risk and provide early intervention.
- xv. Administrative tasks:** AI can help automate administrative jobs such as student attendance tracking; staff recruitment and selection, time-tabling and scheduling the applicants. This is supported by Teixeira, et al., (2021). It can also assist in student registration, enrollment and data entering and recording.
- xvi. Decision-Making:** AI provides educational leaders with data-driven insight to inform on decisionmaking (Baker 2019). AI powered analytical tools help analyse student performance and progress, teacher effectiveness, programme evaluation, resource allocation and strategic planning. AI enables personalized decision –making, tailoring support to individual needs. Administrators are freed to focus on strategic decision making (Knox & Sinclair 2019)
- xvii. Teaching Support:** AI is relevant in educational management in the area of provision of support for teachers through automated teaching assistance, intelligent tutoring, lesson planning and curriculum development tools, student performance tracking and analysis, professional development, training recommendations. According to Bullock, et al., (2019), AI enables teachers support with data-driven insights, which enables teachers refine teaching practices
- xviii. Student assessment:** AI can assist educational management through grading of assignments and examinations evaluate student responses and provide instant feedback, identify knowledge gaps and areas for improvement. It also provides personalized feedback and recommendations, support for continuous assessment and evaluation (kotsovos, 2017). The relevant of Artificial Intelligence in educational management is to enhance the overall quality of education, improve student outcomes, and support teachers and administrators in their roles.

Perception of school managers on Artificial Intelligence integration and degree of integration in educational leadership

People generally have different perceptions about things. Chernov and Chernova (2019) noted that there are three schools of thought regarding the integration of into educational management: one considers AI as beneficial technology to support decision-making, another emphasizes the potential improvement of humanity through AI-support cooperation, and the other sees AI as a threat that can make humans redundant in many parts



of life. No matter which school of thought, it is evident that school managers have to tackle the opportunities and challenges brought by AI technologies into the realm of education.

However, school managers have a generally positive perception about AI, with many seeing its potential to enhance administrative tasks and improve education outcomes. Karakose & Tulubas (2024), views digital leadership as an important part of school management practices and guides the efficient use of recent technologies in teaching and learning. The authors further found that AI technologies offer several opportunities to improve school-wide leadership, practice open management based on the principles of transparency, participation, and digital skills, create the required synergy to achieve-ever changing educational goals by integrating teachers, students, and parents into educational processes.

Challenges of AI in educational management

Artificial Intelligence (AI) no doubt is useful in educational management, but there are still some shortcomings associated with it and these are discussed below:

- i. **Data Privacy and security concerns:** AI systems require vast amounts of student and staff data, which raises concerns about data protection, consent, and potential breaches. Ensuring the confidentiality, integrity, and security of the data is crucial. AI algorithms require high-quality data, hence, the data could be incomplete and inaccurate posing security concerns. (Bostrom & Yudkowsky, 2014).
- ii. **Ethical considerations:** In AI decision-making can be biased if algorithms are flawed or trained on biased data leading to unfair outcomes. Mittelstadt et al., (2016) opined that AI decision making in educational management could raise ethical concerns in the aspect of fairness, transparency and accountability.
- iii. **Administrator-Teacher-training and support:** Administrators and educators need training and support to effectively integrate AI-powered tools into teaching practices. Effective integration of AI in educational management requires teacher-training and support, which could be resource-intensive (Eubanks, 2018).
- iv. **Depersonalization of learning:** AI powered resources must align with curriculum standard and learning objectives. According to Knox (2019), over reliance on AI could lead to a lack of human interaction and depersonalization of learning.
- v. **Cost and funding:** In recent times, government at different levels in the country as variedly indicated and suggested that government may shrink government involvement and involvement in education sector which sometimes are direct pointer to education (Usman, 2023). This shrink of government could pose a challenge in the cost and funding. AI required significant investment in infrastructure, training and resources.
- vi. **Continuous evaluation and implementation:** Regular assessment and refinement of AI powered solutions requires continuous evaluation in order to ensure their effectiveness, relevance and improvement. This is because it requires significant resources, including time, money and personnel for its implementation (Brewer & Brewer). Ensuring high-quality data and effective data management can be challenging, particularly in educational systems (Bullock et al., 2019)
- vii. **Over-dependency of technology:** Over-dependency of AI technology could lead to diminished critical thinking and problem learning skills. Over-reliance on AI-powered tools could reduce face-to-face interactions between students and teachers, potentially leading to feelings of loneliness and disconnection (Ford, 2019.) Overdependence could stifle creativity and critical thinking because of overreliance rather than developing problem-solving (Kirschner & Karpinski, 2010).



- viii. **Potential biases:** Biases could be human, algorithmic, cultural, and environmental and data. As corroborated by Mason and Rennie (2018), since AI systems are developed by human beings and are stereotype, developer could be bias. The same is applicable to algorithms, developer could introduce biased assumptions, the environmental bias could be by environmental factors and data bias could sample bias, by collecting data from a specific demographic (Bullock et al., 2019, O'Neil, 2016). ix. **Infrastructure and resource constraints:** The implementation of AI in education requires significant investment in infrastructure and resources, which can be a challenge for many school leaders and educational institutions (UNESCO, 2020).

Conclusion

It is undeniable that the integration of Artificial intelligence in school management has several opportunities and challenges. However, there is a seemingly hope for educational system with integration of AI. To address the intricate issues of the present time, school leaders need to embrace innovative ideas that foster on critical thinking, personalize learning and creativity. AI powered tools could help school leaders in achieving much.

Suggestions to addressing Artificial Intelligence challenges

Based on the above relevance and challenges associated with AI in educational Management the following are suggested:

1. **Invest in AI education and Training:** Administrators, educators and handlers of AI facilities should be trained with the skills and knowledge needed to develop and implement AI systems. Training and development should be provided on regular bases for handlers in order to be updated with best practices.
2. **Awareness creation:** Adequate awareness should be created among administrators and educators in order to arose their curiosity and willingness to embrace the new technology.
3. **Building technologies that are fair, transparent, and accountable:** Focus should be on building technologies that help connect, find communities, and growth while ensuring transparency and accountability. Ensuring transparency in AI-driven decision-making and addressing potential discrimination is essential.
4. **Collaboration across departments:** Collaboration should be encouraged across different departments; this will bring about trust and team spirit. Collaborative and project-based learning should be encouraged in order to enhance problem-solving and critical thinking skills. Professional development should be encouraged.
5. **Government should fund education:** Government should invest highly in line with the UNESCO recommendation of at least 4-6% of her Gross Domestic Product (GDP) on education, this will enable education have sufficient resources to provide necessary AI facilities that would enhance quality education for all as envisioned in 2030.

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