



## APPLICATION OF ARTIFICIAL INTELLIGENCE IN SECONDARY SCHOOLS' ADMINISTRATION IN NIGERIA

<sup>1</sup> **Dr. Esther, Baba Shamaki**  
shamakiesther@gmail.com

<sup>2</sup> **Dr. Nwunuji, E. G.**  
nwunujiemmanuel@gmail.com

<sup>2</sup> **Dr. Amamra, R. T.**  
rissim1508@gmail.com

<sup>1-3</sup> Dept. of Educational Foundations,  
Taraba State University, Jalingo,  
Taraba State, Nigeria

### **Abstract:**

*This paper examined the “application of artificial intelligence in the administration of secondary education in Nigeria”, using a systematic review of literature. The focus of the paper was on the application of AI in secondary school administration considering administration of secondary school education, areas of application of AI in educational administration, importance of AI in school administration, administrative tasks on artificial intelligence and challenges of AI application in school administration. The paper concluded that AI play vital roles in school administration for teaching and examination, as well as reduce school administrators’ functions among others. The paper suggested among others that AI should be applied in school administration to enable school administrators spend more time on other important roles. Guidelines should be made to protect students’ privacy and ensure data security to prevent AI from being used for surveillance purpose and guarantees to ensure that the system (AI) work seamlessly to provide a cohesive and efficient educational experience.*

**Keywords:** Artificial Intelligence, Administration of Schools, Secondary Education, Administrative tasks

### **Introduction**

Administration when applied in the school, is called educational or school administration. Amadi (2015), refer to educational administration as the process of bringing men and materials together for functional and improved teaching and learning in the educational system for the achievement of set educational goals. It also involves a systematic utilization of available human and material resources for implementing educational programmes within the guidelines of educational polices in order to achieve the goals of education. Educational administration is the careful arrangement of the resources (human, material, time, constraints and programs) available in the educational system and systematically mobilizing them to function as a unit for the achievement of educational objectives. Educational administration is the achievement of the overall objectives of formal school education. It is the process of harnessing human and material resources for teaching and learning to be effective and for the realization of predetermined educational goals. In considering the role of human resource in the administration of human resource in the administration of secondary school education, it is very demanding to accomplish set goals.

Secondary education is a very important level of education. It acts as a connection between the primary education and the tertiary institutions of learning. According to FRN (2014), secondary education is the education children received after primary education and before the tertiary stage. Secondary education is very important both to the development of the individual, the society and for meeting the educational goals of the nation. Educational policies and standards are formulated to make sure that teaching and learning is geared toward achieving set educational goals. In as much as the nation has good educational goals, there is need for proper administration of this level of education to make sure that the set educational goals are achieved. In other words, the presence of administrators in schools cannot be over emphasized in order to achieve the aims



and objectives of secondary education which is majoring in preparing students for higher education and good living within the society.

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. One of the most abreast of these scientific developments is artificial intelligence, which appeared in the Fifties of the last century that is considered as a major turning point in human history. Artificial intelligence has revolutionized education due to its many benefits and its ability to increase the efficiency and effectiveness of managers, teachers and students. Jordan and Mitchell, (2015) remarked that artificial intelligence is a field of study where agents can perceive the environment and make decisions. Tao, Qi, Wang and Nee, (2019), are of the view that computers perform cognitive functions similar to human ones taking into account the ways of learning, understanding, thinking and interacting. This implies that 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 are crucial to promote administration of secondary education. Hence the importance of studying artificial intelligence applications in the field of educational administration with its various processes and improving its productivity. Artificial intelligence applications have gained great interest in various fields, including educational administration. 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, (Hwang, Xie, Wah, and Gašević, 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 administration processes has been recognized all over the world (Aisami et al., 2020).

## **Clarification of Concepts**

### **Artificial intelligence (AI)**

Artificial intelligence can be the simulation of human intelligence in machines programmed to think and learn like humans. Russel and Norvig (2016), refer to artificial intelligence as 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. AI systems are designed to imitate human cognitive abilities, adapt and improve their performance based on experience and feedback. Parker, (2021), opined that 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. Therefore, artificial intelligence has become increasingly important in various fields, including administration of schools by performing a number of tasks such as analyzing student performance, personalized learning and administrative processes. This is supported by Hutt, Mills, and White (2020), who noted that 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, 2023). In addition, artificial intelligence can automate administrative tasks, allowing teachers to focus more on educating and guiding students in general, (Hutt, et al, 2020). AI applications in education have the potential to revolutionize the way educational institutions are administered and improve student outcomes. Artificial intelligence has the potential to revolutionize many areas, by providing intelligent systems that can help with educational administration tasks.

### **Administration of Secondary School Education**

Administration in secondary schools entails the process of, organizing, directing, and controlling resources (human, financial, and physical) within an educational institution to achieve specific goals and objectives. It involves various activities such as curriculum development, teacher training, student assessment, and school budgeting. Administration of schools is carried out by an individual or group with the main aim of getting things done through the available resources for the accomplishment of set goals. For administration to be smooth, proper organizing and controlling of human resource, material and financial resources becomes paramount. Administration of schools is a role carried out by individuals called administrators who



have the knowledge and skills of organising and directing organisational resources which could be human or material to achieve educational aims and goals. Administration of schools include: discipline, supervision, effective leadership, delegation of duties, monitoring, motivation and communication (Ngeripaka et al, 2019). Similarly, Kasim (2017) outline school administration to include: planning, decision-making, organizing, coordinating, motivating, directing, evaluating, staffing, and budgeting. Educational administration is a process by which administrators of secondary schools organize, coordinate and supervise all the resources available in the educational system in order to ensure that educational goals are achieved. Ogundele et al. (2015) concurred that school administration entails the process and activity of managing resource allocation, financial planning and execution, staff appraisal, community relationship, pastoral care, discipline, use of practical skills necessary for effective implementation of educational policies, effective communication, curriculum implementation, conflict handling among other. Specifically the task of the school administrator include; planning, organising, directing, supervising, and evaluating the school system among others. At the secondary school level, principals are the administrators. In addition, Ukpong (2020), opined that secondary school administration is the process of integrating the efforts of human resources and utilizing appropriate materials and services to draw maximum educational benefit from the available resources. Secondary school is the intermediate level of education which is an inevitable bridge between the primary school and higher institution. It can only be productive if there is effective and efficient administration of human and material resources available to it. This is in agreement with Agogbua and Agu (2021), who opined that roles of secondary school administrators are duties carried out by administrators of secondary schools in their day to day school business.

### **Areas of application of Artificial Intelligence in Educational Administration**

The application of AI in school administration has resulted in successful teaching. The use of artificial intelligence (AI) in the admissions process and in student classification which has being tedious and time-consuming procedure had been made simple and easy for students through the use of AI. Other areas are school admissions process, submission of application forms, interview process, assessment test, uploading of school documents, completion of registration, payment of school fees, adding of students to the roll. Also, students can learn from anywhere in the world using AI systems, applications, and assistance. With such programs replacing some types of classroom instructions, AI can in certain cases replace teachers. Educational AI-driven administrative tasks can help students enjoy basic administrative skills, but as these programs expand and develops learn more, a broader variety of administrative tasks are likely to be offered to students, (Staff, 2016). Similarly, Smith (2021 and 2022) outlines several applications of AI in school administration as follows:

1. Personalized learning: AI can be used to create customized learning paths for individual students, based on their strengths and weaknesses, learning styles, and interests.
2. Intelligent tutoring systems: AI-powered tutoring systems can provide real-time feedback to students, adapt to their individual learning needs, and track their progress.
3. Student performance prediction: AI algorithms can analyze data on student performance, attendance, and other factors to predict which students may be at risk of falling behind and intervene early.
4. Automated grading: AI can be used to grade multiple-choice and shooort-answer questions, freeing up teacher time for other tasks.
5. Learning analytics: AI can help educators analyze student data to identify trends and patterns, evaluate the effectiveness of teaching methods, and make data-driven decisions.
6. Chatbots and virtual assistants: AI-powered chatbots and virtual assistants can provide students with instant answers to common questions, freeing up teachers and administrators to focus on more complex tasks.
7. Campus safety: AI-powered surveillance systems can detect unusual behavior and potential threats, alerting campus security personnel in real-time.
8. Recruitment and admissions: AI can be used to analyze applicant data and identify candidates who are most likely to succeed in a given program.
9. Financial aid and student services: AI can help institutions automate financial aid applications, identify students who may be eligible for scholarships or other forms of aid, and provide personalized support to students.



10. Curriculum development: AI can be used to analyze trends in the job market and identify the skills and knowledge that students will need in the future, informing the development of new curricula and programs.

### **The importance of Artificial Intelligence in School Administration**

Artificial intelligence has emerged as an important tool for school administration, revolutionizing and simplifying various administrative processes. In terms of enabling school administrators 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 (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 (Igbokwe, 2023). The importance of artificial intelligence in educational administration lies in its ability to enhance efficiency and effectiveness in educational institutions. In recent years, the application of artificial intelligence in educational administration 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, have been used to provide personalized support and quick responses to student inquiries. This not only reduces the workload of teachers, 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 secondary schools administrator identify at-risk students and intervene early to improve retention rates, (Yun, Shun, Junta, and Browndi, 2022).

The use of artificial intelligence applications in school administration provides many benefits. One of the main advantages is the mechanization of administrative tasks, which allows school administrators 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, et al., 2021). Ultimately, the integration of artificial intelligence into school administration can lead to greater efficiency and effectiveness in the learning process through the following:

1. Simplification of administrative processes: Simplified administrative processes in educational institutions can be significantly enhanced by using artificial intelligence applications. Igbokwe, (2023), stressed that 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. It is clear that AI applications have significant implications for school administration, especially when it comes to streamlining administrative processes and enhancing decision-making capabilities.
2. Save time and cost: In recent years, the adoption of artificial intelligence in school administration has led to many benefits, including time and cost savings. Artificial intelligence algorithms 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, 2021). Moreover, AI applications have the potential to simplify processes and optimize resource allocation, resulting in significant cost savings for secondary schools by making use of AI technologies, school administration can focus more on strategic decision-making and student support, resulting in improved efficiency and effectiveness (Mandernach, Gonzales, and Garrett, 2020)
3. Efficient resource allocation: The effective allocation of resources plays a crucial role in school administration, in particular in the implementation of artificial intelligence applications. Through artificial intelligence algorithms, secondary schools 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 school administration, but also allows learning experiences



to be customized to meet the evolving needs of individual students (Wayne, et al,2022) ultimately, AI's ability to efficiently allocate resources contributes to the overall effectiveness and success of secondary schools.

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 school administration, 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 and Ayşe, 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, Halverson, Jackson, Mandinach, Supovitz and Wayman, (2009).Data-Driven Decision-Making in administration of schools allows administrators and teachers to make informed, evidence-based choices, which leads to improved student achievement and educational outcomes.

### **Administrative Tasks based on Artificial Intelligence**

Artificial intelligence applications in school administration hold great promise for improving the administrative process in terms of data analytics in school administration 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 school administration 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, et al, (2023) stressed that the deployment of AI-based chatbots in school administration is a promising development that has the potential to simplify administrative processes and enhance the student experience, Pawlik, Płaza, Denziak, and Boksa (2022) further classified administrative tasks of AI into the following:

1. **Automated student registration and scheduling:** Automated registration and scheduling of students is an essential aspect of school administration that can be of great benefit from the implementation of artificial intelligence. AI systems can simplify the enrollment process by analyzing student data, such as academic transcripts and preferences, to suggest appropriate courses. 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, can enhance administrative efficiency and facilitate student success. (De Sousa, Bueno and Sato, 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 school administration, providing decision making support through advanced algorithms 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 school administration to optimize resource allocation and Student Support strategies (Mandernach, Gonzales, and Garrett, 2020) thus, school administration can greatly benefit from the use of artificial intelligence for data analysis and Decision Support.

3. **Predictive analytics of student success:** In the modern school administration 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, Chen, and Cui, 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, 2020). 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 school administration can enable secondary schools to make data-informed decisions and provide targeted support to students and teachers, leading to the achievement of educational goals.

4. AI can be used to improve the efficiency of administrative tasks in educational institutions. AI-powered systems can automate routine tasks, such as grading, scheduling, and record-keeping, freeing up educators' time to focus on more impactful work, such as lesson planning and student engagement, (Oztok and Zingaro, 2019). School administrators have to deal with a lot of administrative tasks, such as scheduling, grading, and record-keeping. AI can automate many of these tasks, freeing up educators' time to focus on teaching and supporting students.

5. **Enhancing Learning Outcomes:** Recent research suggests that the application of artificial intelligence in school administration can help to improve learning outcomes for students, (Gupta, 2020). For example, AI-powered tutoring systems can provide personalized feedback and adaptive learning experiences that are tailored to each student's needs and learning style, (O'Neil and Chuang, 2019). AI can also be used to analyze large amounts of student data, such as assessment scores and behavioral patterns, in order to identify areas where students may be struggling and provide targeted interventions, (Zawacki-Richter and Anderson, 2014). Overall, the integration of AI in school administration has the potential to enhance teaching and learning practices and improve student outcomes. Indeed, AI can help school administrators identify which teaching methods and materials are most effective in enhancing learning outcomes. This information can be used to refine and improve the curriculum, resulting in better student performance.

### **Challenges of artificial intelligence applications in school Administration**

The uncertainty in the development of artificial intelligence brings new challenges. Artificial intelligence is a destructive technology with 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 in schools Administration raises considerations and concerns that ensure that AI systems are designed and used in a way that respects the privacy and autonomy of students and teachers. The following are the envisage challenges of AI in Administration of schools:

1. **Job Displacement:** AI in educational management also raises concerns about job displacement. AI can automate administrative tasks, and there is a fear that this will lead to job losses for educators and administrators.
2. **Lack of Ethical and Legal Guidelines:** One of the primary challenges of AI in educational management is the lack of ethical and legal guidelines. AI algorithms can produce biased and discriminatory results, and it is essential to ensure that AI is used ethically and transparently.
3. **Tendency for Excessive Dependence on AI:** There is a concern about the over-reliance on AI in educational management. AI should not replace human educators but rather support them in their work.
4. **Lack of Technical Expertise and Resources:** The lack of technical expertise and resources. AI requires specialized skills and knowledge, and educational institutions may lack the necessary resources to implement AI effectively.



5. Lack of Interoperability and Compatibility: Another challenge is the lack of interoperability and compatibility between different AI systems. Educational institutions use several different systems, such as learning management systems, student information systems, and assessment tools.

### Conclusion

Artificial intelligence is being used in administration of school for teaching, examination and other school activities, AI also allows administrative activities to be automated so that secondary school administrators reduce the time needed to perform challenging tasks to spend more time with students. AI's educational transformations can automate the expedition of teachers' and secondary schools administrative duties processes of admissions and interview with the students, where the schools get many applications and the process of selecting the students for interview is a lengthy process which can be reduced by using Artificial Intelligence in secondary schools administration system. Administrators expend much time on graduate tests, evaluating homework and supplying their students with useful answers. However, AI can be used to simplify the classification tasks involving several checks. This means, rather than spending long hours grading, teachers will have more time with their students.

### Suggestions

1. It is essential to ensure that the use of AI does not lead to job displacement but rather supports educators in their work.
2. It is crucial to have guidelines that protect student privacy, ensure data security, and prevent AI from being used for surveillance purposes
3. It is essential to ensure that AI is used as a tool to enhance teaching and learning, not replace it.
4. Training and professional development opportunities must be provided to ensure that educators and administrators have the skills to use AI effectively.
5. It is essential to ensure that these systems can work together seamlessly to provide a cohesive and efficient educational experience.

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