

Artificial Intelligence in School Administration in the Post-Basic Education and Career Development (PBECD) in Nigeria

GALADIMA, Farida Ibrahim

Faculty of Education, Department of Adult and Continuing Education Federal University, Wukari, Nigeria
galadima@fuwukari.edu.ng

ABDULLAHI, Muhammad Yakub

Faculty of Education, Department of Adult and continuing Education Federal University, Wukari Nigeria.
abdullahim@fuwukari.edu.ng

Received: 2023 15, Nov

Accepted: 2023 18, Dec

Published: 2024 12, Feb

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Abstract. This paper assessed the impact of Artificial Intelligence on school administration and teachers job performance in post-basic education and career development (PBECD) in Nigeria. Secondary data were used in the paper. The data were collected from print and online publications. The paper established that Artificial Intelligence aids effective school administration such as Data analysis and Decision Making, Automation of Administrative task, Resource Optimization, Student Support and intervention among others. It also identify some challenges and ethical considerations in schools such as Ethical Use of Student Data, Data Privacy and Security Concerns, Potential Bias in AI Decision Making. The studies also suggest that School administrators have to periodically inspect AI systems for bias and take actions to mitigate any found flaws. Additionally, varied and representative datasets should be used to train AI systems in order to reduce biases in decision making. Based on this findings, the paper concludes that government should increase investment on Artificial Intelligence infrastructure facilities in post-basic education and career development (PBECD) in Nigeria.

Key words: Artificial Intelligence, School Administration, Teachers Job Performance, Post-Basic Education and Career Development (PBECD).

INTRODUCTION

Post-Basic Education and Career Development (PBECD) is the education children receive after a successful completion of ten years of Basic Education and passing the Basic Education Certificate Examination (BECE) and Junior Arabic and Islamic Studies Certificate Examination (JAISCE). It includes: (i) senior secondary education, (ii) higher school; and (iii) continuing education given in Vocational Enterprise Institutions (VEIs) to either Basic Education graduates who are not proceeding to Senior Secondary Schools, or Senior Secondary graduates that are not proceeding to the tertiary level, as a means of preparing them for the world of work, wealth creation and entrepreneurship (Federal Republic of Nigeria, 2013).

The objectives of Post-Basic Education and Career Development (PBECD) are to: provide holders of the Basic Education Certificate and Junior Arabic and Islamic Studies Certificate with opportunity for education of a higher level, irrespective of gender, social status, religious or ethnic background; offer diversified curriculum to cater for the differences in talents, disposition, opportunities and future roles; provide trained manpower in the applied sciences, technology and commerce at sub-professional grades; provide entrepreneurial, technical and vocational job-specific skills for self-reliance, and for agricultural, industrial, commercial and economic development; develop and promote Nigerian languages, art and culture in the context of world's cultural heritage; inspire students with a desire for self-improvement and achievement of excellence; foster patriotism, national unity and security education with emphasis on the common ties in spite of our diversity; and raise morally upright and well-adjusted individuals who can think independently and rationally, respect the views and feelings of others and appreciate the dignity of labour. The realization of the objectives of Post-Basic Education and Career Development (PBECD) depends on the availability of materials and human resources available in the educational institutions. Artificial intelligence (AI) is included in the materials resources.

Conceptual Clarifications

Key concepts such as artificial intelligence, school administration were clarified as follows:

Artificial Intelligence

Artificial Intelligence has applications across numerous fields, including health care, finance, transportation, customer service and education. It has the potential to transform industries, improve efficiency and create new opportunities (AFSA 2022). Alagbe (2023) viewed AI as the ability of a computer or machine to mimic the capabilities of the human mind – learning from examples and experience, recognising objects, understanding and responding to language, making decisions, solving problems – and combining these and other capabilities to perform functions a human might perform, such as greeting a hotel guest or driving a car. Artificial Intelligence refers to the development of computer systems capable of performing tasks that typically require human intelligence (AFSA 2022). These tasks include learning, reasoning, problem solving, perception and natural language understanding. Artificial Intelligence technologies encompass various techniques and approaches, such as machine learning, deep learning, natural language processing, computer vision and robotics. These technologies enable computers to analyze vast amounts of data, recognize patterns, make predictions and automate complex processes. Ogunode, Agbade & Bassey (2023)

defined AI as programs designed with human-like intelligence and structured in forms of computer, robot, or other machines to aid in provision of any kind of service or tasks to improve social economic and political development of the society. Artificial Intelligence is an application or program constructed to carry out tasks with human like intelligence. Ogunode also viewed Artificial Intelligence as collections system, packages and application designed into digital computer or computer-controlled robot to carry out assignments and tasks with human-like intelligence. Artificial intelligence (AI), according to Copeland (2023) is the ability of a digital computer or computer controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. Frankenfield (2023) defined Artificial intelligence (AI) as simulation of human intelligence by software-coded heuristics. Artificial Intelligence is a branch of science producing and studying the machines aimed at the stimulation of human intelligence processes. Artificial intelligence (AI) are machines programme forms with capacities and abilities to execute tasks and responsibilities that human beings are performing with the assistance of human-like intelligence (Ogunode & Ejike, (2023).

School Administration

School administration is the internal arrangement of school resources to the implementation of school programme. School administration look at education from the specific educational institutions. It is the internal activities that deal with coordinating of school programme for optimum performance (Zaifada, Olowonefa & Ogunode, 2023). School administration according to Ogunode and Ahaotu, (2021); Ogunode, Ahaotu and Obi- (2021) is the arrangement of school input in an order for the smooth realization of the school objectives. Okereke (2008) stated that school administration involves managing, administering the curriculum, teaching, pastoral care, discipline, assessment, evaluation, and examinations. He added as part of school administration: resource allocation, costing and forward planning, staff appraisal, relationship with the community, use of the practical skills necessary for surviving the policies of organization such as decision-making, negotiation, bargaining, communication, conflict handling, and running meetings. These functions are complex and to efficiently and effectively perform them requires the appropriate tools and resources. School administration Ogunode (2020a) is defined as the process of organizing and arranging school resources to implement school programmes with the aim of achieving the school objectives. School administration is the systematical way of placing, ordering and arranging both human and materials resources for the execution of school programmes with the aim of achieving the set objectives of the school.

Sang, Valcke, Van Braak, and Tondeur, (2010) observed that school administration has an essential role in ascertaining that education is put across to students as recommended. School administration also deals with the effective and efficient utilization of school resources to actualizing the school programmes (Ogunode, Lawan, Gregory & Lawan, 2020). Ogunode & Emmanuel (2021) objectives of school administration is to integrate and coordinate all the physical and human resources efficiently towards a common goal. The physical resources mainly contribute to building equipment and instructional materials. The human resources that school administration deals with

include; students, teachers, supervisors, administrators and parents. The additional elements comprise the various aspects of educational theory and practice including philosophy of education, objectives of education, curriculum, method of teaching, discipline, the role of the teacher, rules and regulations etc. These elements are “parts, made into the whole” and are components brought into a harmonious relationship.

Impact of Artificial Intelligence on School Administration

Here are some ways that AI could influence school administrators' roles and responsibilities, as identified by the American Federation of School Administrators [AFSA] (2023, paras. 7-13) and Teachflow (2023):

1. **Data Analysis and Decision Making:** AI aids administrators in analyzing large data volumes, identifying patterns and trends, and informing decision-making processes. This information aids in developing data-driven strategies for improving student outcomes, resource allocation, and program evaluation. Chan, & Tsi, (2023); Bordia (2023) and AFSA (2022) noted that AI can assist administrators in analyzing large volumes of data, such as student performance data, attendance records and resource allocation. AI-powered systems can identify patterns, trends and insights that can inform decision-making processes. Administrators can use this information to develop data-driven strategies for improving student outcomes, allocating resources effectively, and evaluating programs and initiatives. Sang, Valcke, Van Braak & Tondeur (2010) and Ogunode & Olowonefa (2023) noted that AI can aid school administration in areas of decisions making, forecasting, school objectives, programming school activities planning, budgeting, establishing and interpreting policies, examination, sporting activities and prize-giving/ graduation. Westagilelabs (2022) and Bordia (2023) maintained that to eliminate manual administration work in schools, colleges and universities such as scheduling, rescheduling classes, marking attendance, grading papers, finance, and accounting and record keeping. This streamlines the regular, mundane tasks that no longer need to be done by the staff. AI tools can perform various functions like ending truancy alerts, report cards and other correspondence to the parents automatically, Plan and schedule meetings, Automate routine, student forms, enrollments, and other paperwork to the correct department, Shorten the time spent on progress reports AI, Streamline any other record-keeping tasks. It can enable teachers and professors to focus primarily on improving educational quality instead of manual paperwork and reducing work pressure.

2. **Automation of Administrative Tasks:** AI can automate routine administrative tasks, such as managing student records, generating reports, scheduling and handling routine inquiries. By automating these processes, administrators can save time and allocate their efforts to more strategic and value-added tasks. Administration of school is saddled with the responsibility of ensuring stable academic calendar and implementation of programmes as planned. Administrators are to ensure full supervision and implementation of teaching programme. Administrators are saddled with responsibilities of planning school time table, teacher's schedules and school calendar (Bojorquez & Vega, 2023; Teachflow, 2023). AFSA (2022) observed that AI can automate routine administrative tasks, such as managing student records, generating reports, scheduling and handling routine inquiries. By automating these processes, administrators can save time and allocate their efforts to more strategic and value-added tasks. 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 (Ogunode, Edinoh & Chinedu 2023; Ogunode & Ejike, 2023; Oztok & Zingaro, 2019). Educational institutions 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.

3. **Resource Optimization:** AI can help administrators optimize the allocation of resources, such as staff, classrooms and materials. By analyzing data on student enrollment, class sizes and scheduling, AI systems can suggest efficient resource allocation strategies to optimize learning environments and support student needs.

4. **Student Support and Intervention:** AI can assist administrators in identifying students who may require additional support or intervention. By analyzing various data points, such as academic performance, attendance and behavior, AI systems can flag students who may be at risk of falling behind or facing challenges. This allows administrators to proactively implement interventions and provide targeted support to improve student outcomes.

5. **Streamlined Communication and Engagement:** AI-powered communication systems can streamline communication between administrators, teachers, students and parents. Chatbots and virtual assistants can handle routine inquiries, provide information and direct individuals to the appropriate resources. This can improve efficiency and accessibility in communication, freeing up administrators' time for more complex interactions and strategic decision making (AFSA, 2023; Teachflow, 2023).

6. **Enhanced Security and Safety:** AI can contribute to school security and safety measures. Facial recognition systems and video analytics can help monitor school premises, detect potential security threats, and ensure the safety of students and staff. AI-powered systems can also analyze social media or online platforms to identify potential risks and proactively address them.

7. **Teachers Job Performance:** Teacher job performance refers to the execution of instructor's responsibilities and tasks in the educational institutions. Teacher job performance is the level by which the teachers accomplished their given functions and assignment in the schools (Olabisi, Okolo, & Ogunode 2023; Raupu, Maharani, Mahmud, Alauddin 2021). Zaifada, Olowonefa, & Ogunode (2023) defined teachers' job performance to include writing of lesson note, lesson plan, organization of instrument materials, assigning of test and examination, marking, representing of school, extra-curriculum activities and motivation of students. Teachers' job performance encompasses all the activities and programmes teachers carry out in the school and the extent to which the activities are achieved. Teachers' job performance is the degree by which teachers executes their official responsibilities in the school. AI has helped teachers in educational institutions to carry out their functions. Specifically, AI has assisted teachers to execute the following function; teaching, preparation of lesson plan and lesson note, result preparation, marking of students exams via online and project supervision according to Igbokwe (2023) and Ogunode, Idoko & ThankGod (2024). Westagilelabs (2022) observed that tutoring programs or intelligent tutoring systems (ITS) based on artificial intelligence are equipped to handle personalized feedback and instructions for one-on-one teaching. However, they cannot replace teachers since they are not advanced enough to teach how a human can. They can help in scenarios where human tutors are not available for small lessons

that can be taught and evaluated online. It can be an effective tool in e-learning platforms to teach languages, geography, circuits, medical diagnosis, computer programming, mathematics, physics, genetics, chemistry, etc. They are designed to factor in engagement, metrics for grading and comprehension. Ogunode and Gregory (2023); Ogunode & Ejike, (2023) and Language magazine (2023) noted that AI can be applied to aid delivery of lecture or implementation of teaching programme in educational institutions. Ogunode, Edinoh & Chinedu (2023) concluded that the teaching programme is a core programme of educational institutions and is very critical to the attainment of school objectives. The teaching programme covers the preparation of lecture notes, presentation of lectures, assessment of students academic programmes via tests and examinations, marking of students' scripts, preparation of students' results, integration of resources into lecture presentations and classroom management. These entire things that constitute teaching programmes can be easily done by deployment of Artificial intelligence. AI has led to aid effective school management, lesson presentation, improve learning engagement, assist in conduct of examination, aid online teaching and learning, aid effective classroom management, aid fast marking and result preparation and aid school security (Laskowski & Tucci,2023).

Potential Challenges and Ethical Considerations of AI in Schools

This section explores the potential ethical challenges and considerations related to the integration of AI in schools and the ethical issues that need to be addressed as identified by Teachflow (2023).

1. Ethical Use of Student Data:

AI systems require extensive student data, but ethical use is crucial. Schools must obtain informed consent, limit data usage to educational purposes, and avoid sharing with third parties. Administrators must consider ethical implications like data privacy, algorithmic bias, and transparency in establishing policies. Igbokwe, (2023) submitted that 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. It is crucial to have guidelines that protect student privacy, ensure data security, and prevent AI from being used for surveillance purposes.

2. Data Privacy and Security Concerns:

The use of AI in schools involves the collection and analysis of vast amounts of student data. This raises concerns about data privacy and security. It is crucial to ensure that student data is handled securely and in compliance with relevant privacy laws and regulations. Ogunode & Gregory (2023c) noted that another limitation of AI in educational management is the potential for data privacy and security breaches. Igbokwe, (2023) and Akkaya-Kalayci & Yildirim (2020), maintained that the use of AI in educational management requires access to large amounts of data, including personal information about students, faculty, and staff. This data is vulnerable to cyberattacks and other security breaches, potentially exposing sensitive information and undermining the trust and confidence of stakeholders.

3. Potential Bias in AI Decision Making:

AI systems are trained on data, and if the training data contains biases or inaccuracies, it can lead to biased decisions. This is particularly concerning in educational settings, where biases can perpetuate inequalities and impact students' educational opportunities. Ogunode & Gregory (2023c) observed that the problem of AI in educational administration is the potential for bias and discrimination. Igbokwe, (2023) and Mason and Rennie (2018), asserted that AI algorithms may replicate and amplify existing biases and discrimination in educational systems, leading to further inequality and injustice. For example, AI may perpetuate gender or racial biases in student evaluations or admissions decisions. Educational managers need to be aware of these limitations and work to ensure that AI is used in a fair and equitable manner.

4. Transparency and Accountability:

AI algorithms can be complex and challenging to comprehend, raising concerns about transparency and accountability. Another significant limitation of AI in educational administration is the lack of transparency and interpretability. As noted by Veletsianos (2019); Ogunode, (2023c) Igbokwe, (2023) that AI algorithms can be complex and difficult to understand, making it challenging for educational managers to evaluate their effectiveness and identify potential errors or biases. This lack of transparency and interpretability can make it difficult for educational managers to make informed decisions and improve their institutions' performance.

Suggestion

The following suggestions were given to enhance application of Artificial Intelligence (AI) in Administration of the Post Basic Education and Career Development (PBCD):

1. Schools should adopt strong data protection policies, secure storage systems, and provide transparency to students and parents on data usage.
2. Administrators should create policies, guidelines, and safeguards to promote responsible and ethical usage of AI technologies in educational institutions.
3. School administrators should ensure equitable access to AI technologies and resources for all students, regardless of their socioeconomic background. Schools need to develop strategies to bridge the digital divide and provide equal opportunities for all students to benefit from AI advancements.
4. Schools should ensure transparency in AI decision-making processes, provide explanations for decision-making, and establish mechanisms to hold AI systems accountable and address potential errors or biases.

Conclusion

This paper assessed the impact of Artificial Intelligence on school administration and teachers job performance in post-basic education and career development (PBECD) in Nigeria. The paper established that Artificial Intelligence aids effective school administration and assisted teachers to perform their job in post-basic education and career development (PBECD) in Nigeria. Based on this findings, the paper recommended that government should increase investment on Artificial Intelligence infrastructure facilities in post-basic education and career development (PBECD) in

Nigeria.

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