IMPACT OF ARTIFICIAL INTELLIGENCE ON EDUCATIONAL E-MANAGEMENT IN ADDRESSING GLOBAL INEQUALITY

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Abstract: The current state of educational e-management systems in Nigerian tertiary institutions is a crucial aspect to consider, especially in addressing global educational inequality. By employing a descriptive survey research design, this study aimed to explore the potential applications of Artificial Intelligence (AI) in educational e-management within the Nigerian tertiary educational system. The research focused on the target population from selected tertiary institutions in Lagos State, involving 300 participants including both students and lecturers. The primary data collection tool, "Artificial Intelligence on Educational e-Management Systems in Addressing Global Educational Inequality Questionnaire," utilized a four-point Likert scale to gather information on the participants' perceptions. Through the analysis of the collected data using simple percentages and descriptive statistics, the study determined the acceptance or rejection of specific statements related to the potential of AI to address educational inequality in Nigerian tertiary educational institutions. With a high reliability level established through Cronbach's Alpha testing, the findings revealed that the current state of educational e-management systems in Nigeria is in need of improvement, with many areas lacking efficient systems for managing educational resources and addressing inequality. However, the potential applications of AI in educational e-management within Nigerian tertiary education are vast, offering opportunities for streamlining processes, enhancing access to resources, and personalized learning experiences. Additionally, the potential of AI to address educational inequality within the Nigerian tertiary educational system is also promising. The study recommended that there is need to investigate further the potential of artificial intelligence to address educational inequality in Nigerian tertiary educational institutions. **(251 word count**

Keywords: Artificial Intelligence, educational e-management, tertiary institutions, global inequality and Nigeria

I.   Background to the Study

Artificial intelligence (AI) has become an integral part of many industries, including education. Educational institutions worldwide are increasingly turning to AI technologies to improve efficiency, enhance learning outcomes, and address global inequality in education. E-management, according to Egwunyenga *et al.* (2017) the use of electronic systems to manage educational processes, has been particularly revolutionized by AI, offering a range of benefits and possibilities for improving access to quality education for all.

Education, on the other hand, remains a cornerstone of individual and societal development (Firdaus *et al.*, 2020) . However, a persistent challenge plagues the global education landscape: inequality. Disparities in access to quality education persist across geographical regions, socioeconomic backgrounds, and individual circumstances (Hinton *et al.*, 2018).

McKinsey and Company. (2020) in its publication asserts that the impact of AI on educational e-management in addressing global inequality is a critical area of research that has far-reaching implications for the future of education. As the world becomes increasingly interconnected, the need for effective e-management solutions that can bridge the gap between different geographic locations, socio-economic backgrounds, and educational levels becomes more pressing. By understanding the potential of AI in e-management, educators and policymakers can develop strategies to ensure that all students have access to high-quality education, regardless of their circumstances (Hammond *et al.*, 2019).

The integration of AI into educational e-management systems presents significant opportunities for personalized learning**,** AI algorithms can analyze student data to personalize learning experiences, tailoring content, pace, and difficulty to individual needs. This can be particularly beneficial for students with diverse learning styles

or requiring additional support as submitted by Roll and Wylie (2016). In terms of adaptive learning platforms, Popenici and Kerr (2017) opine that AI-powered platforms can dynamically adjust learning materials and assessments based on student performance, providing real-time feedback and promoting mastery of concepts.

Additionally, AI can automate administrative tasks such as grading, scheduling, and student record management, freeing up educators' time to focus on personalized instruction and student interaction (Zawacki-Richter *et al*., 2019).

Furthermore, AI can analyze vast amounts of educational data to identify trends, predict student performance, and inform evidence-based decision making for administrators and educators. This data-driven approach can optimize resource allocation and target interventions towards areas of greatest need.

World Bank (2019) asserts that use of AI in educational e-management offers a wide range of benefits, including increased efficiency, personalized learning experiences, data-driven decision-making, and improved access to educational resources. AI-powered e-management systems can automate administrative tasks, streamline communication between students and educators, and provide real-time insights into student performance. This allows educators to tailor their teaching methods to meet the individual needs of each student, leading to improved learning outcomes and a more inclusive educational environment. By leveraging the capabilities of AI in educational e-management, the potential to address global educational inequality becomes more tangible (Wang and Vassileva, 2019).

While the potential benefits of AI are undeniable, there are also arguments to consider. Arguments for AI in Educational E-Management: Proponents of AI in educational e-management argue that the use of AI technologies can help address the systemic inequalities that exist in education systems around the world (Smith *et al*., 2020). By leveraging AI to improve access to educational resources, Siemens *et al*. (2019) submit that personalize learning experiences, and support data-driven decision-making, educators can better meet the diverse needs of students from different backgrounds and ensure that all students have the opportunity to succeed academically.

AI can automate tasks and personalize learning experiences at scale, potentially reaching a larger student population with limited resources. AI can analyze vast amounts of data to identify trends and patterns in student performance, providing valuable insights for educators and policymakers. AI tools can free up educators' time from administrative tasks, allowing them to focus on fostering student engagement and personalized learning experiences. However, concerns exist regarding data privacy, potential bias in algorithms, and the potential for AI to replace human interaction in education according to Zawacki-Richter *et al*. (2019). Unequal access to technology and internet infrastructure can exacerbate existing inequalities if AI solutions are not designed inclusively. Overdependence on AI could potentially diminish the irreplaceable role of human educators in fostering critical thinking, social-emotional learning, and personalized guidance.

Several empirical studies have explored the impact of AI on educational e-management and its potential to address global inequality. For example, a study conducted by McKinsey and Company (2020) found that AI-powered e-management systems can help reduce administrative burdens on educators, allowing them to focus more on teaching and supporting students. Another study by the World Bank (2019) highlighted the role of AI in providing personalized learning experiences that can help close the achievement gap between students from different socio-economic backgrounds.

Roll and Wylie (2016) in their study advocate for AI-powered communication platforms to enhance student-instructor interaction in online learning environments, while Zawacki-Richter *et al*. (2019) highlight the need for critical reflection on the ethical implications of AI in education, particularly regarding potential biases and student-instructor power dynamics. In the same vein, Popenici and Kerr (2017) address the potential conflicts arising from AI implementation, including privacy concerns and the need to maintain a balance between AI-driven instruction and human interaction. These studies underscore the immense potential of AI while emphasizing the need for careful consideration of ethical implications and responsible implementation strategies.

The potential benefits of AI in addressing global educational inequality are too significant to ignore. The danger of not using AI for educational e-management is that educational institutions may continue to perpetuate existing inequalities and fail to provide all students with equal access to quality education (Kizilcec and Halawa, 2017). Without AI-powered e-management systems, educators may struggle to meet the diverse needs of their students, leading to inequitable learning outcomes and reinforcing social disparities. By neglecting the potential of AI in education, institutions risk widening the gap between privileged and marginalized students, further exacerbating global inequality in education.

Without AI-powered tools for personalized learning and data-driven decision making, the gap between well-resourced and under-resourced educational systems will likely widen. Educators may be overburdened with administrative tasks, limiting their ability to provide personalized attention and support to students. Failure to

leverage AI's capabilities hinders the development of innovative educational solutions that can cater to diverse learning needs and contexts (Kowalski and Faust, 2018).

The impact of artificial intelligence on educational e-management in addressing global inequality is a critical area of research that has the potential to transform education systems and improve access to quality education for all students. By leveraging AI technologies to automate administrative tasks, Al-busaidi and Alhinai (2020). Submit that personalize learning experiences, and support data-driven decision-making, educators can create a more inclusive and equitable educational environment that empowers students from diverse backgrounds to succeed academically. As the world becomes increasingly interconnected, the need for effective e-management solutions that can bridge the gap between different geographic locations, socio-economic backgrounds, and educational levels becomes more pressing. Through further research and collaboration, educators and policymakers can harness the power of AI to ensure that all students have the opportunity to thrive in a rapidly changing world. This study seeks to examine the impact of artificial intelligence on educational e-management in addressing global inequality using selected tertiary institutions in Lagos state as a case study.

Statement of the Problem

Rapid advancements in AI are impacting education globally. This research explores AI's potential to address educational inequality in developing countries, focusing on Nigeria's e-management systems. Nigeria's education system struggles with inadequate funding, overcrowded classrooms, and limited resources. These factors widen the educational gap for disadvantaged students. AI offers a solution through personalized learning. Machine learning algorithms can analyze student data to create learning experiences tailored to individual needs, potentially closing the achievement gap for underprivileged students.

Furthermore, AI can streamline administrative tasks like scheduling and resource allocation, freeing up educators to focus on teaching. However, digital divide remains a challenge. Students from low-income families may lack access to technology and internet, hindering their ability to benefit fully from AI-powered education tools. It is against this background that this study examines the impact of AI on educational e-management in addressing global inequality, with a focus on the Nigerian education system.

Purpose of the Study

This research aims to investigate the potential impact of artificial intelligence (AI) on educational e-management systems in addressing global educational inequality, using the Nigerian education system as a case study.

Specifically, the study will focus on the following objectives:

i. analyze the current state of educational e-management systems in Nigerian tertiary educational system;
ii. evaluate the potential applications of AI in educational e-management within the Nigerian tertiary educational system and
iii. assess the potential of AI to address educational inequality in Nigerian tertiary educational system.

Research Questions

1. What is the current state of educational e-management systems in Nigerian tertiary educational system?
2. What are the potential applications of AI in educational e-management within the Nigerian tertiary educational system?
3. What are the potential of AI to address educational inequality in Nigerian tertiary educational system?

Literature review-Overview of Artificial Intelligence in Education Management

AI is transforming education by streamlining management, personalizing learning, and informing decisions. Machine learning and other AI tools automate tasks, recommend learning paths, and analyze student data to identify gaps. According to Adamson *et al.* (2018), this personalized approach can address educational inequality by providing students, especially those in under-resourced areas, with tailored learning opportunities. AI can also enhance teacher effectiveness. Chatbots can handle administrative tasks, freeing up teachers for more strategic planning and student support. Additionally, AI can analyze data to optimize resource allocation across different regions and communities (Buckley *et al.*, 2018).

Ojo *et al.* (2021) opine that Nigeria's education system struggles with limited resources and overcrowded classrooms. AI-powered e-learning platforms offer a solution by delivering interactive content and personalized learning experiences, regardless of location or background. AI can also assist teachers in managing classrooms, track student progress, and collaborate with colleagues (Osuagwu *et al.*, 2020). The key to success lies in a human-centered approach. Initiatives like UNESCO-supported projects in Nigeria promote collaboration between AI and educators, ensuring AI complements, not replaces, teachers. By leveraging AI strategically, Nigeria can improve educational outcomes and reduce educational inequality for all students.

II. Methodology

This study used a descriptive survey to investigate student behaviour regarding exam misconduct in select Nigerian universities. 300 participants were chosen from five public universities in Lagos State. Each university provided 60 participants, including 55 students and 5 lecturers from Educational Management, regardless of gender. A self-designed questionnaire titled Artificial Intelligence (AI) on Educational e-Management Systems in Addressing Global Educational Inequality Questionnaire (AIEMSGEIQ) (15 statements), measured student perceptions on a 4-point Likert scale (Strongly Agree - Strongly Disagree). The questionnaire's validity and reliability were confirmed by field professionals and Cronbach's Alpha (0.984).

Data analysis used percentages for response frequency and descriptive statistics (mean and standard deviation) for quantitative data. A mean score of 2.5 or above (calculated from assigned Likert scale values) indicated agreement with a statement, while a score below 2.5 indicated disagreement. This approach analysed student perceptions on the research topic within the chosen universities.

III. Results and Discussion of Findings

Research Question One: What is the current state of educational e-management systems in Nigerian tertiary educational system?

The data for answering this research question were obtained from Section B of the instrument and presented in Table 1

Table 1: THE CURRENT STATE OF EDUCATIONAL E-MANAGEMENT SYSTEMS IN NIGERIAN TERTIARY EDUCATIONAL SYSTEM

S/N	ITEMS	SA	A	D	SD	$\bar{x}$	Remarks
1.	The e-management systems are not functional or beneficial.	50	60	100	90	2.23	Disagreed
2.	The e-management systems have significant issues and are not meeting educational needs.	150	80	40	30	3.17	Agreed
3.	The e-management systems are functional but have room for improvement.	115	50	85	50	2.77	Agreed
4.	The e-management systems are largely effective and beneficial.	90	70	90	50	2.67	Agreed
5.	The e-management systems are exceptional and are significantly enhancing the educational experience.	60	80	80	80	2.40	Disagreed

N= Number of respondents
Decision rule point= 2.50
$\bar{x}$ = mean
The Average mean score = 2.65

The data presented in Table 1 revealed that the respondents disagreed with two (2) of the five (5) items on the current state of educational e-management systems in Nigeria. The remaining three (3) items were agreed on have mean rating which ranges from 3.17 to 2.67, which are above the decision rule point of 2.50. Thus, the average mean score was 2.65 which is higher than the decision rule point indicating that the current state of educational e-management systems in Nigeria is average.

Research Question Two: What are the potential applications of AI in educational e-management within the Nigerian tertiary educational system?

The data for answering this research question were obtained from Section B of the instrument and presented in Table 2

Key Words:

SA - Strongly Agree; **A** -Agree; **SD** - Strongly Disagree; **D** - Disagree
N – Not at all; **S** – Slightly; **V** - Very; **E** - Extremely
NE – Not Effective; **SE** – Slightly Effective; **VE** - Very Effective; **EE** - Extremely Effective
SA - Strongly Agree; **A** -Agree; **SD** - Strongly Disagree; **D** - Disagree

Table 2: POTENTIAL APPLICATIONS OF AI IN EDUCATIONAL E-MANAGEMENT WITHIN THE NIGERIAN TERTIARY EDUCATIONAL SYSTEM

S/N	STATEMENT	E	V	S	N	$\overline{X}$	Remarks
6.	To what extent do you believe AI can improve the efficiency of educational management in Nigeria?	120	60	110	10	2.97	Agreed
		VH	H	L	VL		
7.	How would you rate the potential of AI in enhancing student learning outcomes in Nigeria?	50	60	100	90	2.23	Disagreed
		SA	A	D	SD		
8.	What is your level of agreement with this statement: "AI can significantly improve the accessibility of education in remote areas of Nigeria."	50	100	120	30	2.57	Agreed
		EE	VE	SE	NE		
9.	How effective do you think AI can be in streamlining administrative tasks in Nigerian educational institutions?	70	100	105	25	2.72	Agreed
		SA	A	D	SD		
10.	Do you believe that AI can play a significant role in personalizing student learning experiences in Nigeria?	90	135	45	30	2.62	Agreed
						2.622	

N= Number of respondents
Decision rule point= 2.50
$\overline{x}$ = mean
The Average mean score = 2.62

The data presented in Table 1 revealed that the respondents disagreed with one (1) of the five (5) items on the potential applications of AI in educational e-management within the Nigerian tertiary educational system. The remaining four (4) items were agreed on have mean rating which ranges from 2.97 to 2.57, which are above the decision rule point of 2.50. Thus, the average mean score was 2.62 which is higher than the decision rule point indicating that the potential applications of AI in educational e-management within the Nigerian tertiary educational system is high.

Research Question Three: What are the potential of AI to address educational inequality in Nigerian tertiary educational system?

The data for answering this research question were obtained from Section B of the instrument and presented in Table 3

Table 3: POTENTIAL OF AI TO ADDRESS EDUCATIONAL INEQUALITY IN NIGERIAN TERTIARY EDUCATIONAL SYSTEM

S/N	STATEMENT	To a great extent	To some extent	Not at all	$\overline{X}$	Remarks
11.	To what extent do you believe AI can help reduce educational inequality in the Nigerian tertiary educational system?	150	60	90	2.2	Agreed

		Curriculum development	Student assessment	Personalised learning		
12.	In your opinion, what are the specific areas in the Nigerian tertiary educational system where AI could have the most impact?	120	140	40	2.54	Disagreed
		Lack of infrastructure	Lack of technical expertise	Resistance to change		
13.	What potential challenges do you foresee in implementing AI in the Nigerian tertiary educational system?	90	140	70	2.78	Agreed
		Yes	No	Unsure		
14.	Do you believe that the use of AI in education could potentially widen the digital divide among students?	100	150	50	2.12	Agreed
		Provide equal access to technology	Offer training and support for students and educators	Develop policies to guide the ethical use of AI		
15.	What measures do you think should be taken to ensure that the implementation of AI in education does not exacerbate existing inequalities?	105	125	70	2.91	Agreed

N= Number of respondents
Decision rule point= 2.50
$\overline{x}$ = mean
The Average mean score = 2.62
The data presented in Table 1 revealed that the respondents disagreed with one (1) of the five (5) items on the potential applications of AI in educational e-management within the Nigerian tertiary educational system. The remaining four (4) items were agreed on have mean rating which ranges from 2.97 to 2.57, which are above the decision rule point of 2.50. Thus, the average mean score was 2.62 which is higher than the decision rule point indicating that the potential applications of AI in educational e-management within the Nigerian tertiary educational system is high.

IV.   Discussion of Findings

Research Question One:
        The data presented in Table 1 indicates that the current state of educational e-management systems in Nigerian tertiary educational system is perceived as average by the respondents. While the majority of respondents agreed that the e-management systems have significant issues and are not meeting educational needs, they also acknowledged that there is still room for improvement and that the systems are largely effective and beneficial. However, it is important to note that a significant number of respondents disagreed that the e-management systems are exceptional and significantly enhancing the educational experience, indicating that there is still work to be done in this area.

This finding aligns with research of Egwunyenga *et al*. (2017) that has highlighted challenges in the implementation and effectiveness of e-management systems in educational institutions, particularly in developing countries like Nigeria. Issues such as inadequate infrastructure, lack of technical support, and resistance to change have been identified by Osuagwu *et al*. (2020) as barriers to the successful implementation of e-management systems in educational institutions.

To improve the current state of educational e-management systems in Nigeria, it is important for institutions to address these challenges by investing in infrastructure, providing training and support for users, and fostering a culture of innovation and adaptability. By doing so, educational institutions can harness the full potential of e-management systems to enhance the educational experience for students and improve overall efficiency and effectiveness.

Research Question Two: Based on the data presented in Table 2, it is clear that there is a strong belief in the potential of AI to improve various aspects of educational e-management within the Nigerian tertiary educational system. For instance, the majority of respondents agreed that AI can improve the efficiency of educational management in Nigeria, enhance student learning outcomes, improve the accessibility of education in remote areas, streamline administrative tasks, and personalize student learning experiences. These findings align with the research conducted by authors such as Kizilcec *et al*. (2017) and Siemens *et al*. (2019), who have highlighted the potential benefits of AI in education in terms of improving efficiency, enhancing learning outcomes, and personalizing learning experiences.

The average mean score of 2.62 indicates a general agreement among respondents regarding the potential applications of AI in educational e-management within the Nigerian tertiary educational system. This suggests that there is a high level of optimism about the role that AI can play in transforming and improving the educational landscape in Nigeria. Overall, the findings from this research question suggest that AI has the potential to significantly impact various aspects of educational e-management within the Nigerian tertiary educational system, with the majority of respondents expressing a positive outlook on its potential applications.

Research Question Three:

The data presented in Table 3 indicates that there is a general agreement among respondents about the potential of AI to address educational inequality in the Nigerian tertiary educational system. Specifically, 150 respondents believe that AI can help reduce educational inequality to a great extent, while 60 respondents believe it can do so to some extent. This finding aligns with the views of authors such as Adamson *et al*. (2018) and Firdaus *et al*. (2020) who have highlighted the potential of AI to bridge the educational gap and improve access to quality education in developing countries like Nigeria.

However, there are also concerns and challenges identified by the respondents regarding the implementation of AI in the Nigerian educational system. For example, 140 respondents believe that lack of technical expertise is a significant challenge, while 90 respondents foresee potential challenges in implementing AI. These findings are supported by studies conducted by Hammond *et al*. (2019) and Ojo *et al*. (2021) which have emphasized the need for adequate training and support for educators to effectively integrate AI into the education system. Furthermore, the data also reflects concerns about the possibility of AI widening the digital divide among students, with 100 respondents agreeing that this could be a potential outcome. It is important to address this issue to ensure that the implementation of AI does not exacerbate existing inequalities. Measures such as providing equal access to technology, offering training and support for students and educators, and developing policies to guide the ethical use of AI are seen as crucial in mitigating these concerns. These findings are in line with recommendations from authors such as Hinton *et al*. (2018) and Smith *et al*. (2020) who have highlighted the importance of addressing digital equity issues in the implementation of AI in education.

While there is optimism about the potential of AI to address educational inequality in the Nigerian tertiary educational system, it is essential to acknowledge and address the challenges and concerns identified by the respondents to ensure that the implementation of AI is effective and equitable. By considering the recommendations of researchers who have studied similar issues, policymakers and educators can create a more inclusive and accessible educational system through the integration of AI technologies.

V.   Conclusion

The research conducted on the impact of artificial intelligence on educational e-management in addressing global inequality, specifically in the context of Nigerian tertiary educational systems, has shown positive potential. The current state of educational e-management systems in Nigeria is in need of improvement, with many areas lacking efficient systems for managing educational resources and addressing inequality. However, the potential applications of AI in educational e-management within Nigerian tertiary education are vast, offering opportunities

for streamlining processes, enhancing access to resources, and personalized learning experiences. Additionally, the potential of AI to address educational inequality within the Nigerian tertiary educational system is promising, with the ability to identify and address gaps in learning opportunities, provide personalized support to students, and ensure equitable access to educational resources. By leveraging AI technology in educational e-management, Nigeria has the opportunity to bridge the gap in educational inequality and provide a more inclusive and accessible education system for all students.

VI.   Recommendations

Based on the findings from the study, the following recommendations were made:

1. There is need to conduct a comprehensive survey or analysis to determine the current state of educational e-management systems in Nigerian tertiary educational institutions. This can involve reviewing existing systems, interviewing educators and administrators, and evaluating the effectiveness of current tools and technologies.

2. There is need to explore the potential applications of artificial intelligence in educational e-management specifically within the Nigerian tertiary educational system. This could involve conducting case studies on institutions that have implemented AI technology in their e-management systems, identifying key benefits and challenges, and assessing the scalability and sustainability of these applications.

3. There is need to investigate the potential of artificial intelligence to address educational inequality in Nigerian tertiary educational institutions. This can involve researching how AI can be used to tailor education to individual students' needs, provide access to educational resources for marginalized communities, and bridge the digital divide in educational settings.

4. The ethical implications of using artificial intelligence in educational e-management needs to be considered, particularly in the context of addressing global inequality. This could involve examining issues related to data privacy, algorithmic bias, and the impact of automation on teaching and learning processes.

5. There is need to collaborate with educators, policymakers, and technology experts to develop strategies for integrating artificial intelligence into educational e-management systems in a way that promotes equity, diversity, and inclusion. This could involve designing training programs for educators, advocating for policy changes, and fostering partnerships between academia and industry to support innovation in this area.

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