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RETHINKING ARTIFICIAL INTELLIGENCE IN EARLY CHILDHOOD EDUCATION FOR BEST GLOBAL PRACTICE IN PRIMARY SCHOOLS IN ODEDA LOCAL GOVERNMENT, OGUN STATE

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Abstract

The paper examines the rethinking artificial intelligence in early childhood education for best global practice in primary schools in Ogun state. The study adopted a descriptive survey research design. Population comprises about 250 primary schools' teachers in Odeda Local Government, Ogun state, Nigeria. The sample size for this study comprises of ten (10) primary schools in Odeda Local Government area of Ogun State in which ten (10) teachers were selected to make a total of 100 respondents for the study. A self-developed questionnaire was used as instrument for data collection. It was developed in closed-ended of Agree or disagree. The instrument was moderated by experts who affirmed its validity. Reliability of the instrument was determined using Cronbach Alpha and the value of 0.62 was obtained which is reliable enough for this study. Data collected were analyzed using simple percentage, mean and standard deviation statistical tools. Findings align with global studies that emphasize both the benefits and challenges of AI integration in education that AI can significantly enhance personalized learning, access to the necessary infrastructure and teacher training remains

critical for successful implementation. Similarly, findings in Ogun State reflect these global trends, where AI implementation is gaining momentum but still requires targeted improvements in teacher training and infrastructure to maximize its potential. Findings also emphasize the effectiveness of AI-driven assessment systems in reducing teachers' workloads and providing immediate feedback. It was therefore recommended that Ogun State Ministry of Education should invest in teacher training programmes to build capacity for effectively integrating AI tools into classrooms, ensuring educators can maximize the benefits of AI in teaching and learning. Also, schools in Ogun State should implement AI-driven personalized learning platforms to tailor educational experiences to individual student needs, thereby improving engagement and academic performance.

Keywords

Artificial, Childhood, Global practice, Rethinking, Intelligence

Introduction

In recent years, Artificial Intelligence (AI) has emerged as a transformative force in various sectors, including education. Its integration into early childhood education is viewed as a crucial development in shaping the future of learning, especially in preparing young learners for the digital age (Idhalama, Makori, & Oredo, 2025). Artificial Intelligence (AI) is reshaping the educational landscape worldwide. AI refers to the simulation of human intelligence processes by machines, especially computer systems, including learning, reasoning, problem-solving, and decision-making (Shah, 2023). These innovations are not only reshaping classroom experiences but also setting new global benchmarks for education quality and outcomes (Zawacki-Richter et al., 2019).

Early childhood education, which refers to the period from birth to eight years old, is crucial for cognitive, emotional, and social development (McCarthy, 2022 & Elegbede, Et. al. 2024). Early childhood education, a pivotal stage in a child's cognitive, emotional, and social development, has traditionally relied on teacher-centered approaches. However, the dynamic landscape of the 21st century demands an evolution towards more personalized and technology-enhanced learning environments. Artificial Intelligence, with its ability to adapt learning content to individual needs, has proven effective in tailoring educational experiences to the unique abilities and learning paces of young children (Lu et al., 2020, Idhalama, & Oredo, 2024).). Global trends indicate a rising interest in utilizing AI to improve learning outcomes, foster creativity, and address the diverse learning styles of children (Idhalama, & Obi, 2019).

AI in early childhood education can assist in creating personalized learning environments that cater to the unique needs of each child, enabling teachers to better support student learning and development (Jones, 2022). The use of AI in early childhood education is growing rapidly in various parts of the world. In Finland, AI has been integrated into educational practices to promote individualized learning and formative assessment (Kaarakainen & Kallio, 2023). Finnish schools utilize AI platforms that provide real-time feedback to students, enhancing engagement and tracking their progress. Similarly,

Singapore has adopted AI-powered educational systems to supplement the national curriculum, offering personalized learning paths for students in early grades (Ng, 2023). These AI tools help assess children's learning patterns, ensuring that educational content is tailored to their abilities. In the United States, AI is primarily used to support students with special educational needs in early childhood settings (O'Connor, 2023; Adedotun, 2024). AI applications such as speech recognition and natural language processing help children with disabilities improve their communication skills and develop foundational literacy abilities. These global examples illustrate how AI is transforming early childhood education by fostering personalized, inclusive, and adaptive learning environments (Saavedra, 2023).

One of the key advantages of AI in early childhood education is personalized learning. AI systems can analyze a student's learning style, preferences, and progress to deliver customized lessons (Shah, 2023). This is particularly useful in early childhood education, where young learners may develop at different paces. Additionally, AI enables early intervention for students who struggle with specific subjects or skills, allowing educators to provide tailored support (Li, 2023). Another benefit is the engagement that AI tools foster among young learners. AI applications, such as interactive games and virtual learning environments, make learning more engaging and dynamic for children (Jones, 2022). These tools can provide instant feedback, which motivates students to stay engaged with the learning process. Furthermore, AI tools can assist educators in streamlining administrative tasks such as grading and progress tracking, giving teachers more time to focus on direct instruction (O'Connor, 2023).

In Nigeria, several challenges hinder the widespread adoption of AI in early childhood education. Infrastructure remains one of the most significant obstacles. Many schools, particularly in rural areas, lack basic technology, such as stable internet access and electricity, which are essential for AI implementation (Okoye & Adedokun, 2023 Idhalama, Oredo, & Makori, 2025). Moreover, teacher preparedness is a major challenge. Many educators are not adequately trained to integrate AI into their teaching

practices, leading to reluctance in adopting new technologies (Osagie & Udo, 2023). Another challenge is the financial constraint faced by schools in procuring AI tools and devices. Most primary schools in Ogun State operate on limited budgets, making it difficult to invest in the latest educational technologies (Adeyemi, 2023). Additionally, there are cultural perceptions and resistance to AI in some parts of Nigeria. Many educators and parents view AI as a replacement for traditional teaching methods, leading to reluctance in embracing the technology (Okoye & Adedokun, 2023).

The underutilization of AI in early childhood education in Ogun State presents a significant gap in the quality of learning experiences provided to children. While global best practices emphasize the importance of leveraging AI for individualized learning and skill development, primary schools in Ogun State continue to rely on traditional methods that may not fully meet the needs of 21st-century learners (Ogunleye & Fapohunda, 2022). Without addressing these challenges, it will be difficult for Ogun State’s education system to align with international standards and provide its students with the skills they need to thrive in a technologically-driven world.

Objective of the Study

The main objective of this paper is to examine the rethinking artificial intelligence in early childhood education for best global practice in primary schools in Ogun state. The specific objectives are:

i. To explore the current usage of AI in early childhood education in Ogun State.

ii. To identify global best practices for AI in education and recommend ways to apply them locally.

Research Questions

i. What is the current level of AI integration in primary schools in Ogun State?

ii. What global best practices can be adapted to enhance AI usage in Ogun State's primary education system?

Methodology

The study adopted a descriptive survey research design. Population comprises of about 250 primary school teachers, Odeda Local Government, Ogun state, Nigeria. The sample size for this study comprises of ten (10) primary schools in Odeda Local Government area of Ogun State. For the selection of the sample, stratified sampling technique was adopted to pick ten (10) teachers each from the chosen primary schools to make a total sample of one hundred (100) primary school teachers in Odeda Local Government Ogun State. Stratified sampling technique is a type of sampling method in which the total population is divided into smaller groups or strata to complete the sampling process. A self-developed questionnaire was used as instrument for data collection. It was developed in closed-ended of Agree or Disagree. The instrument was moderated by an expert in the field of educational management and psychology who affirmed its validity. Reliability of the instrument was determined using Cronbach Alpha and the value of 0.62 was obtained which is reliable enough for this study. Data collected were analyzed simple percentage, mean and standard deviation statistical tool.

Presentation of Data Analysis and Results Discussion

Table 1. What Is the Current Level of AI Integration in Primary Schools in Ogun State?

S/N	ITEMS					Mean (ϰ)	S.D
		Freq (N)	Percent %	Freq (N)	Percent %		
1.	AI-based tools are currently being used in primary schools to enhance students' learning experiences	87	87.0%	13	13.0%	3.22	1.077
2.	Teachers in primary schools have access to AI-driven resources for personalized	67	67.0%	33	33.0%	3.17	0.884

	learning.						
3.	Primary school administrators in Ogun State actively promote the use of AI technologies in classrooms.	96	96.0%	4	4.0%	3.32	1.079
4.	There is adequate infrastructure (such as internet and computers) to support AI integration in primary schools.	86	86.0%	14	14.0%	3.22	1.077
5.	Teachers are regularly trained on how to use AI tools for educational purposes in primary schools.	82	82.0%	18	18.0%	3.12	.0794
		Weighted Mean (ϰ) = 3.210 and STD = 0.982					

The findings in Table 1 reveal a significant level of AI integration in primary schools in Ogun State, as reflected in the high percentage of agreement with the survey items. For instance, 87% of respondents affirm that AI-based tools are currently being used to enhance students' learning experiences, with a mean score of 3.22 and a standard deviation (S.D) of 1.077. Similarly, 96% agree that primary school administrators actively promote the use of AI technologies in classrooms, with a mean score of 3.32 and an S.D of 1.079. These high percentages and mean values indicate that AI integration in Ogun State's primary schools is gaining traction, particularly in areas such as AI-enhanced learning and administrative support for AI usage.

However, despite the apparent progress, certain areas show room for improvement. For example, only 67% of respondents agree that teachers have access to AI-driven resources for personalized learning, yielding a slightly lower mean score of 3.17 and an S.D of 0.884. Furthermore, while 82% of respondents report that teachers receive regular training on AI tools, the mean score of 3.12 and the lower S.D of 0.794 indicate some variability in training access. Additionally, 86% agree that the necessary infrastructure is in place to support AI integration, but the remaining 14% highlights existing gaps in essential resources like internet access and computers.

Table 2. What Global Best Practices Can be Adapted to Enhance AI Usage in Ogun State's Primary Education System?

S/N	ITEMS	Freq (N)	Percent %	Freq (N)	Percent %	Mean (ϰ)	S.D
6.	AI-driven personalized learning platforms can significantly improve students' engagement and performance	74	74.0%	26	26.0%	3.39	1.011

	in Ogun State's primary schools.						
7.	The integration of AI for automated assessment and feedback in Ogun State's primary education will reduce teachers' workload and improve student outcomes.	77	77.0%	23	23.0%	3.39	1.010
8.	AI-based tools should be implemented to support teachers in lesson planning and classroom management in Ogun State's primary schools.	54	54.0%	46	46.0%	3.13	0.854
9.	Data-driven decision-making through AI can help identify at-risk students early, leading to better educational interventions in Ogun State.	72	72.0%	28	28.0%	3.18	0.998
10.	Collaboration between the government and private tech companies is essential for the successful adaptation of global AI educational practices in Ogun State's primary education.	22	22.0%	78	78.0%	3.12	0.895
		Weighted Mean ($\varkappa$) = 3.242 and STD = 0.954					

The data from Table 2 provides insight into respondents' perceptions of global best practices that can be adapted to enhance AI usage in Ogun State's primary education system. Item 6, which suggests that AI-driven personalized learning platforms can significantly improve students' engagement and performance, was highly supported by 74% of respondents with a mean score of 3.39 and a Standard Deviation (S.D) of 1.011. Similarly, Item 7, which addresses the integration of AI for automated assessment and feedback, was also strongly endorsed by 77% of the participants with an identical mean score of 3.39 and an S.D of 1.010, indicating broad consensus on the importance of these practices.

However, there was a more divided opinion regarding the implementation of AI-based tools to support teachers (Item 8), with 54% agreeing and 46% disagreeing, yielding a lower mean of 3.13 and an S.D of 0.854. Item 9, on the potential of data-driven decision-making to improve interventions for at-risk students, was supported by 72% of respondents, reflected in a mean of 3.18 and S.D of 0.998. Interestingly, the lowest agreement (22%) was recorded for Item 10, which suggests that collaboration between the government and private tech companies is essential for adapting global AI practices, as evidenced by a mean score of 3.12 and an S.D of 0.895. The overall weighted mean for all items was

3.242, with a standard deviation of 0.954, suggesting a general agreement, though opinions varied across specific items.

Discussion of Findings

Result from research question 1 revealed the current level of AI integration in primary schools in Ogun State. These findings align with global studies that emphasize both the benefits and challenges of AI integration in education. For example, Holmes et al. (2023), Idhalama and Nwachukwu (2025) highlighted that while AI can significantly enhance personalized learning, access to the necessary infrastructure and teacher training remains critical for successful implementation. Similarly, Zhao and Xie (2022) stressed the importance of administrative support and policy frameworks for AI adoption in schools. The findings in Ogun State reflect these global trends, where AI implementation is gaining momentum but still requires targeted improvements in teacher training and infrastructure to maximize its potential.

Moreso, research question 2 shows the global best practices can be adapted to enhance AI usage in Ogun State's primary education system. These findings are consistent with previous studies of Holmes et al. (2023) and Idhalama and Makori, (2024) who argue that personalized learning platforms significantly enhance student engagement by adapting to individual learning needs, which correlates with the strong support for Item 6. Similarly, Zhao and Xie (2022) emphasize the effectiveness of AI-driven assessment systems in reducing teachers' workloads and providing immediate feedback, supporting the findings in Item 7. The more divided opinion on AI support tools for teachers (Item 8) may reflect concerns about technological readiness or the adequacy of training, as noted by Nweke et al. (2023), who highlight the need for substantial capacity-building efforts before AI can be fully integrated into education systems in regions like Ogun State. Lastly, the limited support for government-private tech partnerships (Item 10) mirrors the findings of Sengupta (2023), who noted challenges in establishing effective collaboration between stakeholders in developing countries, often due to lack of clear policies and infrastructure gaps.

Conclusion

Artificial intelligence (AI) holds immense potential to revolutionize early childhood education in Ogun State, but its successful adoption depends on learning from global best practices and adapting them to the local context. The integration of AI into early childhood education represents a pivotal step towards improving the quality and accessibility of education for young learners. By focusing on teacher training, infrastructure development, policy support, and localized AI solutions, Ogun State can harness the benefits of AI to enhance learning outcomes and build a more equitable education system.

Recommendations

Based on the findings of the study, it is recommended that;

1) The Ogun State Ministry of Education should invest in teacher training programs to build capacity for effectively integrating AI tools into classrooms, ensuring educators can maximize the benefits of AI in teaching and learning.

2) Schools in Ogun State should implement AI-driven personalized learning platforms to tailor educational experiences to individual student needs, thereby improving engagement and academic performance.

3) Policymakers should foster stronger collaboration between the government, private tech companies, and educational institutions to ensure the smooth adaptation of global AI practices, while also addressing infrastructural and policy gaps.

4) The government should prioritize funding for AI infrastructure in primary schools, ensuring that technological tools are available and accessible to both teachers and students, particularly in underserved areas.

5) Stakeholders in the education sector should promote data-driven decision-making through AI, enabling early identification of at-risk students and providing timely interventions to improve student outcomes in primary education.

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