ASSESSMENT OF AVAILABILITY AND APPLICATION OF ARTIFICIAL INTELLIGENCE PRACTICES FOR ENHANCED MANAGEMENT OF PUBLIC SECONDARY SCHOOLS IN ANAMBRA STATE

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Abstract

The study assessed the extent of availability and application of artificial intelligence practices for enhanced management of public secondary schools in Anambra State. In pursuit of this, two research questions were drafted and answered while two null hypotheses were tested at 0.05 levels of significance. Survey research design was adopted for the study with a sample size of 550 respondents, consisting of 50 principals and 500 teachers drawn through a multistage sampling technique. An instrument, titled 'Availability and Application of Artificial Intelligence Practices for Enhanced Management of Public Secondary Schools Questionnaire' (AAAIPEMPSSQ) which was validated by three academic research experts was used for the data collection. Reliability of the questionnaire was confirmed through Cronbach's Alpha method with a cumulative coefficient of 0.87. The researcher, together with four research assistants administered and retrieved the responded instrument. Mean and z-test statistic were used for the analysis of the collected data. Results of the analysis revealed among other issues that AI practices are available but to a very low extent and to a very low extent applied for management of public secondary schools in Anambra State. The study concluded that AI practices are rarely available and put to usage for the purpose of managing the public secondary schools in Anambra State. It was recommended that related trainings on the usage of AI for management and advancement of the schools be continually organized for both principals and teachers.

Keywords: *Assessment, Availability, Application, Artificial Intelligence Practices, Enhanced Management, Public Secondary Schools.*

Introduction

Artificial intelligence (AI) as part of emerging technologies have fundamentally changed the way individuals' access information and elaborate knowledge, even in the secondary school system. There is no doubt that AI is becoming part of defining inventions that human endeavours, including education management cannot be isolated from. This underscores how indispensable AI has become in different spheres of our lives. It is considered to be one of the education friendly technologies that are helping to transform and modernize different aspects of the school system, including the management of schools (Ilavbare, 2023). In essence, AI as part of education-friendly technologies provides meaningful and innovative avenues for enhanced management and teaching-learning process in the school system.

Enhanced management could be considered as a situation of improved, innovative and effective administration and handling of the various aspect of the school system in a globally acceptable manner. Throwing more light to the meaning of enhanced school management, Mary and Neena (2017), stressed that in 21st century where AI and digital technologies have become indispensable, school managers must be compliant to and ensure they deploy such contemporary technologies in their managerial duties, so as to improve managerial effectiveness and compete favourably, locally and globally. This is an indication that any AI practices, if available and adequately put to good use in schools, it surely would be the 'game changer'. There

is no denying the fact that emerging technologies, including AI have proven to be supportive in almost all aspects of life, including school management. AI practices, in the form of its prospects and how best to deploy it in school cannot be overemphasized.

Giving further insight on the need for AI in schools, Singh and Singh (2021) outlined that AI can serve the following purpose in educational management: Personalized learning, Assessment and grading, provides 24/7 support for students, useful in Predictive analytics, for Curriculum design and instructional delivery, and providing support for lesson planning and feedback provision. Supporting this, Smith (2022) stressed that applications of AI in the management of schools serves the following purposes: personalization of learning paths for individual students, based on their strengths and weaknesses, learning styles, and interests; automated grading of multiple-choice and short-answer questions; guarantees 24/7 surveillance and security architecture; analyze applicants data for effective identification and placement of candidates for different school programmes; helps institutions automate financial aid applications, and can be used to analyze job trends and restructuring of school curriculum and programs for relevance.

Notwithstanding the numerous benefits of AI in different walks of life, including the school system, Igbokwe (2023) observed it is accompanied with lack of transparency and interpretability, data privacy and security breaches, bias and discrimination, lack of ethical and legal guidelines, job displacement and lack of technical expertise and resources. This means there are lots of issues that come with the subject of AI, including lack of technical experts and supportive resources, especially for schools in the developing economies, such as Anambra State. Similarly, Ilavbare (2023) in a recent study reported that digital facilitation and social media learning platforms are neither available nor utilized for educational purposes in Ika South LGA. Whereas, Nnajiofor and Ejikeme (2020) observed that in Enugu State, digital technologies are neither available nor adequately utilized for the purpose of enhancing teaching and learning. Other scholars, such as Eze (2022), Igwebuike and Chukwujekwu (2023) had carried out similar studies and reported the ICT driven classrooms have not fully become operational in most secondary schools in Anambra State, as most schools still lack the basic ICT tools needed for 21st century schools. These studies and some others not captured in the current study mostly dealt with ICT in general and digital and online facilitation technologies, but did not particularly examine artificial intelligence practices that could be deployed in the public secondary schools in the State. This created a gap that needs to be filled. In attempt to provide remedy to the situation, this study was carried out to assess the extent of availability and application of artificial intelligence practices for enhanced management of public secondary schools in Anambra State.

Statement of the Problem

Artificial intelligence resources as part of the emerging technologies is one of the most promising supports needed to transform different aspects of management in education, so that the goal of education system will be accomplished optimally. However, the platforms for making AI valuable in the schools seem to be neither available nor utilized for educational purposes. AI resources, including digital technologies are neither available nor adequately utilized for the purpose of enhancing management of the schools for improved teaching and learning. It appears that ICT driven classrooms have not fully become operational in most secondary schools in Anambra State. Most schools seem to lack the basic ICT tools needed for 21st century schools. More especially, artificial intelligence practices as a concept seem not to have been giving enough attention both in literature and operations in the public secondary schools in the State. This is not a good sign, no wonder a lot of management team of the schools are believed to be lagging behind in AI knowledge and operational competence. This affect the extent to of AI exposure, knowledge and skills that students, teachers and non-teaching staff of the school need to compete with western schools that are already leveraging AI resources to boost all aspects of their school system. To this effect, it becomes imperative to dwell more on AI related studies for schools in the State. To this end, the problem of this study was put in an interrogatory form: to what extent are artificial intelligence practices available and applied for enhanced management of public secondary schools in Anambra State?

Research Questions

In pursuit of this this, two research questions were drafted and answered:

1. To what extent are artificial intelligence practices available for enhanced management of public secondary schools in Anambra State?

2. To what extent are artificial intelligence practices applied for enhanced management of public secondary schools in Anambra State?

Hypotheses

In pursuit of this study, two null hypotheses were tested at 0.05 levels of significance:

1. There is no significant difference in the mean ratings of principals and teachers responses with regard to the extent to which artificial intelligence practices are available for enhanced management of public secondary schools in Anambra State.

2. There is no significant difference in the mean ratings of principals and teachers responses with regard to the extent of application of artificial intelligence practices for enhanced management of public secondary schools in Anambra State.

Research Method

Survey research design was adopted for the study. From a population of 266 principals and 4,056 teachers in public secondary schools in the Anambra State, a sample size of 550 respondents, comprised of 50 principals and 500 teachers was drawn through a non-randomnized proportionate sampling technique. The proportions represent approximately 19% and 12% of principals and teachers, respectively. An instrument, titled 'Availability and Application of Artificial Intelligence Practices for Enhanced Management of Public Secondary Schools Questionnaire' (AAAIPEMPSSQ) which was validated by three academic research experts was used for the data collection. Reliability of the questionnaire was confirmed through Cronbach's Alpha method with a cumulative coefficient of 0.87. The researcher, together with four research assistants administered and retrieved the responded instrument. Mean and z-test statistic were used to the analysis of the collected data. Mean rating with 2.5 and above was considered high extent, and low extent if it falls below. On the other, if pvalue falls below 0.05, the null hypothesis is rejected, and vice versa.

Presentation and Interpretation of Results

Research Question 1: To what extent are artificial intelligence practices available for enhanced management of public secondary schools in Anambra State?

Table 1: *Mean rating of principals and teachers responses on the extent of availability of artificial intelligence practices enhanced management of public secondary schools in Anambra State*

S/N	To what extent do you accept that the following artificial intelligence practices are available at the school you work for?	Principals' Mean (n=50)	Remark	Teachers' Mean (n=500)	Remark
1.	Adaptive Learning Platforms like DreamBox and Khan Academy	1.01	LE	2.38	LE
2.	Intelligent Tutoring Systems such as Carnegie Learning and Squirrel AI	2.09	LE	2.23	LE
3.	Automated Grading, like Gradescope can grade assignments and exams	2.51	HE	2.54	HE
4.	Predictive Analytics Platforms like BrightBytes	2.33	LE	2.47	LE

5.	Chatbots and Virtual Assistants like EdTech's	2.44	LE	2.11	LE
6.	Language Translation Tools like Google Translate or Microsoft Translator	2.49	LE	2.48	LE
7.	Speech Recognition Tools like Google's G Suite for Education	2.41	LE	2.46	LE
8.	AI tools for security and surveillance in the school, such as CCTV cameras	2.52	HE	2.63	HE
9.	AI Virtual Classrooms and Assistants	2.39	LE	2.27	LE
10.	AI tools for monitoring attendance and truancy in the school	2.46	LE	2.38	LE
11.	AI tools for the creation of educational content, such as quizzes, lesson plans, and interactive activities	2.44	LE	2.34	LE
	Cluster Mean	**2.28**	**LE**	**2.39**	**LE**

Results on Table 1 shows that average rating for both principals and teachers with regard to items on numbers: 1, 2, 4, 5, 6, 7, 9, 10 and 11 were lesser than the cut-off point, 2.5. This indicates that on average and to a low extent, both principals and teachers are in agreement that the items reflecting AI practices are not available. However, the mean ratings for both principals and teachers for items: 3 and 8 are greater than 2.5, indicating a high extent of availability of CCTV cameras and Automated Grading as part of AI practices in the school. In case of the cumulative mean, principals have a mean rating 2.28 while teachers have 2.39. These cluster mean ratings fall below 2.5, implying that availability of AI practices for enhanced management of public secondary school in Anambra State is generally low.

Research Question 2: To what extent are artificial intelligence practices applied for enhanced management of public secondary schools in Anambra State?

Table 2: *Mean rating of principals and teachers responses on the extent of application of artificial intelligence practices for enhanced management of public secondary schools in Anambra State*

S/N	To what extent do you agree that the following artificial intelligence practices are put to use at the school you work for?	Principals' Mean (n=50)	Remark	teachers' Mean (n=500)	Remark
1.	Adaptive Learning Platforms like DreamBox and Khan Academy, etc	2.01	LE	2.11	LE
2.	Intelligent Tutoring Systems such as Carnegie Learning and Squirrel AI	2.02	LE	2.13	LE
3.	Automated Grading, like Gradescope can grade assignments and exams	2.56	HE	2.51	HE
4.	Predictive Analytics Platforms like BrightBytes	2.13	LE	2.22	LE
5.	Chatbots and Virtual Assistants like EdTech's	2.31	LE	2.33	LE
6.	Language Translation Tools like Google Translate or Microsoft Translator	2.42	LE	2.48	LE
7.	Speech Recognition Tools like Google's G Suite for Education	2.42	LE	2.38	LE
8.	AI tools for security and surveillance in the school, such as CCTV cameras	2.60	HE	2.51	HE
9.	AI Virtual Classrooms and Assistants	2.45	LE	2.38	LE
10	AI tools for monitoring attendance and truancy in the school	2.39	LE	2.30	LE

11	AI tools for the creation of educational content, such as quizzes, lesson plans, and interactive activities	2.48	LE	2.40	LE
	Cluster Mean	**2.34**	**LE**	**2.34**	**LE**

From Table 2, it is revealed that the average ratings by both principals and teachers for questionnaire items, 3 and 8 are greater than the benchmark of 2.5. This shows that to a high extent, both items are considered to be put to use in the for the purpose of making the school better. However, the mean ratings for both principals and teachers on the following individual items: 1, 2, 4, 5, 6, 7, 9, 10 and 11 are less than 2.5, indicating that they have low extent of application, meaning they are rarely put to use for the advancement of the school. Cumulatively, principals' cluster mean rating is 2.34 while teachers' cluster mean rating is also 2.34. These indicate that cluster mean ratings of both are less than 2.5. This implies that on a general level, artificial intelligence practices are not being put to use in the various public secondary schools in Anambra State.

Hypothesis 1: There is no significant difference in the mean ratings of principals and teachers responses with regard to the extent to which artificial intelligence practices are available for enhanced management of public secondary schools in Anambra State.

Table 3: *z-test of mean rating of principals and teachers responses on the extent of availability of artificial intelligence practices for enhanced management of public secondary schools in Anambra State*

Variables	N	X	SD	DF	p-value	Alpha level	Remark
Principals	50	2.28	0.61	548	0.09	0.05	Not rejected
Teachers	500	2.39	0.67				

Table 3 revealed that the p-value is 0.09, and alpha level is 0.05, which entails that the p-value is greater than the alpha level. This means that the null hypothesis is not rejected. This implies that there is no significant difference in the mean ratings of principals and teachers with regard to the extent to which artificial intelligence practices are available for enhanced management of public secondary schools in Anambra State.

Hypothesis 2: There is no significant difference in the mean ratings of principals and teachers responses with regard to the extent of application of artificial intelligence practices for enhanced management of public secondary schools in Anambra State.

Table 4: *z-test of mean rating of principals and teachers responses on the extent of application of artificial intelligence practices for enhanced management of public secondary schools in Anambra State*

Variables	N	X	SD	DF	p-value	Alpha level	Remark
Principals	50	2.34	0.69	548	0.51	0.05	Not rejected
Teachers	500	2.34	0.67				

From Table 4, it was found out that the p-value is 0.51, and alpha level is 0.05. This interprets that the p-value is greater than the alpha level, meaning that the null hypothesis is not rejected. In essence, this implies there is no significant difference in the mean ratings of principals and teachers with regard to the extent of application of artificial intelligence practices for enhanced management of public secondary schools in Anambra State.

Discussion of Findings

The study reported that the following artificial intelligence practices are not readily available at the school: adaptive learning platforms; Intelligent Tutoring Systems; Automated Grading; Predictive Analytics Platforms; Language Translation Tools; Speech Recognition Tools; AI tools for security and surveillance in the school; AI Virtual Classrooms and Assistants; AI tools for monitoring attendance and truancy in the school, and AI tools for the creation of educational content. Similarly, while Scott, Phu and Sherry (2014) reported that underdeveloped countries are still battling with limited digital technology resources for teaching and learning, Mary and Neena (2017) reported that digital equipment such as a computer or a Laptop, tablet, MP3 player, console, etc., are not readily accessible in schools. In addition, Seymoureducate (2016) reported that instructional technologies needed for teaching and learning are significantly lacking in most school. On the other hand, the study further reported that there is no significant difference in the mean ratings of principals and teachers with regard to the extent to which artificial intelligence practices are available for enhanced management of public secondary schools in Anambra State.

The study also reported that the following artificial intelligence practices are not applied and utilized at the school for enhanced management: adaptive learning platforms; Intelligent Tutoring Systems; Automated Grading; Predictive Analytics Platforms; Language Translation Tools; Speech Recognition Tools; AI tools for security and surveillance in the school; AI Virtual Classrooms and Assistants; AI tools for monitoring attendance and truancy in the school, and AI tools for the creation of educational content. The finding is in tandem with report of Ilavbare (2023), which found that digital/online facilitation and social media learning platforms are not being effectively utilized or applied for educational purposes. It's understandable that AI is undoubtedly part of digital technologies for different purposes, hence both reports are similar. In this regard, the study added that there is no significant difference in the mean ratings of principals and teachers with regard to the extent of application of artificial intelligence practices for enhanced management of public secondary schools in Anambra State. Both principals and teachers share the same or very similar observation about the subject of AI utilization.

Conclusion

The study concluded that AI practices are rarely available for the purpose of managing the public secondary schools in Anambra State. The relevant artificial intelligence practices which are supposed to be put to good use to improve management of schools have not been effective deployed for the purpose, perhaps because the practices are not available in the schools, to a large extent. The responses of both principals and teachers that AI practices are neither available nor utilized for enhanced management of the public secondary schools in Anambra State did not vary significantly. Hence, so far, the needed AI practices for enhanced management are neither fully available, nor effectively put to use in public secondary schools in Anambra State.

Recommendations

It was recommended that related trainings on the usage of AI for management and advancement of the schools be continually organized for both principals and teachers.

In line with findings of the study, the following have been advocated:

1. Government should collaborate with school principals, teachers, experts in emerging technologies and promoters of artificial intelligence to make relevant AI trainings, platforms and gadgets available to secondary schools. It is understandable that AI is one the emerging technologies which well-meaning

institutions and firms are leveraging for the optimization of all aspects management and organisational efficiency, and world class schools have keyed into this. Making AI resources available at schools will no doubt improve the overall management of schools in the State and beyond, as it will trigger off relevant trainings for adoption and usage.

2. Principals, teachers and the entire stakeholders of the public secondary school should cooperate and work as a team with AI experts and emerging technology experts to support schools with trainings on application and usage of AI resource for enhancing overall management of public schools and much more. With adequate training supports, the management of the various schools would learn and master how to put any available AI 'tool' into effective use, thereby ensure efficiency and effectiveness in management.

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