

EXTENT OF INTEGRATION OF ARTIFICIAL INTELLIGENCE IN TEACHING AND LEARNING IN PUBLIC UNIVERSITIES IN ANAMBRA STATE

By

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Abstract

The study examined the extent of integration of artificial intelligence (AI) in teaching and learning in public universities in Anambra State. Three research questions guided the study. The study adopted the descriptive survey research design. The population of the study comprised 7,520 academic staff in all public universities in Anambra State. The sample comprised 376 academic staff in randomly drawn from the population of the study. The instrument for data collection was a questionnaire titled “Questionnaire on the Integration of Artificial Intelligence in Teaching and Learning (QIATL)”. The instrument has 30-items comprising three clusters A, B and C structured on a four-point rating scale. The instrument was validated by three experts in Faculty of Education. The reliability of the instrument was obtained through Cronbach Alpha and it yielded an average coefficient of 0.80, 0.85 and 0.75 for clusters A, B and C respectively. The average coefficient value QIATL was 0.80 which was considered reliable and suitable for the study. Mean and standard deviation were used to answer the research questions and determined the relatedness of the respondents’ mean ratings. The study revealed that university management employs AI-based learning management systems to assist academic staff to enhance course delivery, incorporate AI-based educational applications into instructional delivery, integrate AI technologies into the assessment process to provide automated grading for students among others to a low extent; resistance to change among academics, concerns among senior lecturers about the potential for job displacement, insufficient training opportunities on how to effectively utilize AI tools among others as factors inhibiting the integration of AI in teaching and learning; while enhanced personalized learning experiences tailored to individual student needs, access to vast online learning resources, improved efficiency in administrative tasks, such

as grading of student scores among others are opportunities associated with the integration of AI in teaching and learning in public universities in Anambra State. Based on the findings of the study, it was concluded that school management encourages the integration of artificial intelligence to enhance teaching and learning in public universities in Anambra State to a low extent. It was recommended among others that university management should consider investing in upgrading technological infrastructure and acquiring necessary software licenses to overcome challenges like inadequate technological resources and limited access to high-quality AI software to enable a smooth integration process in public universities in Anambra State.

Keywords: *Artificial Intelligence Integration, Universities, Teaching and Learning, Public Universities*

Introduction

Education is the cornerstone for societal advancement and involves the systematic acquisition of knowledge, skills, values, and attitudes essential for personal development and societal progress. It includes formal, informal, and non-formal learning experiences aimed at fostering intellectual growth, critical thinking, and practical application of knowledge. A well-administered education would equip individuals with capacities to confront problems and changing situations; awaken intellectual curiosity, encourage the spirit of inquiry, and make its recipients inventive, self-reliant, and resourceful (Ugochukwu, Adaobi & Vivian, 2021). Universities as institutions of higher learning within the broader educational environment, serve as catalysts where individuals embark on transformative journeys of academic discovery and personal development. These institutions offer a diverse array of academic programmes, research opportunities, and extracurricular activities, creating fertile ground for intellectual curiosity and scholarly pursuits.

In Nigeria, university education extends beyond mere transmission of information to include collaborative inquiry, experiential learning, and fostering lifelong learning skills necessary for addressing complex challenges in today's changing world. As such, universities play a pivotal role in shaping the educational trajectories of individuals and driving innovation and progress within society. Perhaps this is why Blaike cited in Endurance, Eunice, Uzoma, Andor and Orisakwe (2021) stated that university education is the biggest industry that touches every fabric of human endeavor, whose footings lie in educational activities. These educational activities are being pioneered by lecturers who engage in various pedagogical practices such as instructional delivery, assessment and grading of students' learning outcomes, career guardians, counseling services, and research processes. Getting these tasks done daily may result in emotional exhaustion, stress, and burnout and sometimes could lead to death. Therefore, it becomes imperative to introduce artificial intelligence (AI) to assist in reducing this mental stress.

Artificial intelligence is the simulation of human intelligence in machines programmed to think, learn, and perform tasks typically requiring human intelligence such as understanding natural language, recognizing patterns, solving problems, and making decisions. Omojuwon and Ojo (2021) noted that AI systems are designed to learn from data, adapt to new inputs, and perform tasks autonomously to mimic human cognitive functions. Popenici and Sharon (2017)

noted that the future of higher education is intrinsically linked with developments in new technologies and the computing capacities of new intelligent machines. With the rise of AI solutions, it is important for educational institutions, especially in Nigeria, to begin to embrace the new trend. Artificial intelligence (AI) is now enhancing tools and instruments used day-by-day in cities and campuses around the world. It is currently progressing at an accelerated pace and impacts the profound nature of services within higher education. For example, universities already use an incipient form of artificial intelligence, IBM's supercomputer Watson. This solution provides student advice for Deakin University in Australia at any time of day throughout the year (Deakin University 2014).

The role of technology in higher learning is to enhance human thinking and to augment the educational process, not to reduce it to a set of procedures for content delivery, control, and assessment. Karsenti (2019) explained that AI has not only promoted changes in schools' teaching methods, learning methods, campus environment, and curriculum, but the entire education industry is also undergoing changes through AI. This innovation is believed to play an important role in promoting the reformation of teaching and learning in schools as it will bring new intelligent teaching tools to schools, form new teaching and learning modes, and promote innovation in teaching evaluation methods (Anyadike, 2019). Therefore, educators should actively change their way of thinking, and embrace technology as a complementary tool for their traditional teaching methods.

Ironically, despite the significant roles AI plays in driving different sectors of the economy, such as businesses, transportation, aviation, and education around the world, its impact on Nigeria's education sector is not noticeable. The reason for this could possibly be the fear of being replaced at work. The researchers maintained that integration of AI into the school system is not to replace anyone as feared by many, but to support and ease off some tasks. Olelewe and Onoh (2017) noted that when staff members are relieved of some tasks like provision of admission guidelines, scheduling of lecture time-tables, marking of assignments, grading of student learning experience, and responding to other frequently asked questions (FAQs) from students and prospective students, it will undoubtedly afford them the needed rest. This is particularly important given the significant strain on university staff.

Universities in Nigeria have lost some of their staff due to different forms of ailment ranging from overwork, physical and emotional exhaustion and stress, among others (Endurance et al., 2021). In universities in Anambra State, the case is not different as both academic and non-academic staff are reported dead as a result of stress and different ailments. The implication of this is that when these staff members continue to go down, attention to teaching and learning declines, leading to poor-quality output. The recent events in universities in Anambra State as regards the health of some staff members seem to suggest that the management has refused to ensure the integration of AI tools in the system. Perhaps, it could be that staff members have continued to fight the new trend on the basis that AI would replace them in their jobs. Maybe there are other factors inhibiting the integration of AI to enhance teaching and learning in these universities. It is against this backdrop that this study sought examine the extent of the integration of artificial intelligence in teaching and learning in public universities in Anambra State.

Purpose of the Study

The general purpose of the study was to determine the extent of integration of artificial intelligence (AI) in teaching and learning in public universities in Anambra State. Specifically, the study sought to determine:

1. The extent school management encourages the integration of AI to enhance teaching and learning in public universities in Anambra State
2. Factors inhibiting the integration of AI in teaching and learning in public universities in Anambra State
3. Opportunities associated with the integration of AI in teaching and learning in public universities in Anambra State

Research Questions

1. To what extent does school management encourage the integration of AI to enhance teaching and learning in public universities in Anambra State?
2. What are the factors inhibiting the integration of AI in teaching and learning in public universities in Anambra State?
3. What are the opportunities associated with the integration of AI in teaching and learning in public universities in Anambra State?

Method

The study adopted the descriptive survey design. The study was carried out in Anambra State. The population of the study comprised 7,520 academic staff in Federal Universities in Anambra State. The sample comprised 376 academic staff drawn from the population of the study. The instrument for data collection was a questionnaire titled “Questionnaire on the Integration of Artificial Intelligence in Teaching and Learning (QIATL)”. The instrument has 30 items comprising three clusters, A, B, and C. All the clusters contained a 10-item statement addressing each research question. The instrument was validated by three experts in Faculty of Education. The reliability of the instrument was obtained through Cronbach Alpha which yielded coefficient values of 0.80, 0.85 and 0.75 for clusters A, B and C respectively. Mean and standard deviation were used to answer the research questions and determined the relatedness of the respondents’ mean ratings. Decision on the research questions was based on a cut off mean of 2.50, therefore, an item or cluster mean of 2.50 and above is regarded as agree while mean rating below 2.50 is regarded as disagree.

Results

Research Question One: To what extent does school management encourage the integration of AI to enhance teaching and learning in public universities in Anambra State?

Table 1: Mean Ratings of the Extent to Which School Management Encourages Integration of AI to Enhance Teaching and Learning in Public Universities in Anambra State

S/N	Items	Mean	SD	Remark
1.	University management employs AI-based learning management systems to assist academic staff to enhance course delivery	2.47	.54	LE
2.	The university promotes research in AI for educational purposes through funding opportunities	2.44	.52	LE
3.	The university has established partnerships with AI companies to foster innovation in teaching and learning	2.37	.53	LE
4.	Academic staff are encouraged to incorporate AI-based educational applications into instructional delivery	2.38	.55	LE
5.	AI technologies are integrated into the assessment process to provide automated grading for students	2.41	.52	LE
6.	AI powered simulation tools are available to facilitate practical skill development	2.31	.61	LE
7.	The university management regularly evaluates the effectiveness of AI integration through feedback mechanisms	2.40	.57	LE
8.	AI powered virtual assistants are available to provide students guidance on academic matters	2.43	.63	LE
9.	The management leverages AI for content creation to enrich learning materials	2.34	.52	LE
10.	The university management is supportive of efforts to utilize AI in teaching	2.52	.57	HE
Mean of Means		2.40	.56	LE

The item-by-item analysis in Table 1 shows that the respondents rated items 1-9 as being implemented to a low extent with a mean ranging from 2.31 to 2.44. The remaining item (item 10) with a mean of 2.52 was rated as being implemented to a high extent. The total mean score of 2.40 as shown in Table 1 revealed that school management encourages the integration of artificial intelligence (AI) to enhance teaching and learning in public universities in Anambra State to a low extent.

Research Question Two: What are the factors inhibiting the integration of AI in teaching and learning in public universities in Anambra State?

Table 2: Mean Ratings of the Factors Inhibiting the Integration of AI in Teaching And Learning In Public Universities In Anambra State

S/N	Items	Mean	SD	Remark
11.	Resistance to change among academics to adopt AI technologies in educational settings	2.51	.49	Agree
12.	Concerns among senior lecturers about the potential for job displacement	2.96	.19	Agree

13. Insufficient training opportunities on how to effectively utilize AI tools	2.99	.11	Agree
14. Over reliance on traditional teaching methods	2.53	.61	Agree
15. Inadequate technological infrastructure towards the seamless integration	2.66	.50	Agree
16. Lack of clear guidelines governing the ethical use of AI in education raises concerns about data security	2.86	.19	Agree
17. Limited resources towards AI implementation to facilitated teaching and learning	2.59	.59	Agree
18. Limited access to high-quality AI software due to licensing costs	2.72	.63	Agree
19. Stakeholders' skepticism about AI capabilities potential to enhance learning outcomes	1.93	.26	Disagree
20. lack of evidence demonstrating the effectiveness of AI integration in improving educational outcomes	2.41	.49	Disagree

The analysis in table 2 indicates that the respondents agree to eight of the 10 items as factors inhibiting the integration of artificial intelligence (AI) in teaching and learning in public universities in Anambra State. The eight items include: resistance to change among academics to adopt AI technologies in educational settings (mean, 2.51), Concerns among senior lecturers about the potential for job displacement (mean, 2.96), insufficient training opportunities on how to effectively utilize AI tools (mean, 2.99), over reliance on traditional teaching methods (mean, 2.53), inadequate technological infrastructure towards the seamless integration (mean, 2.66), Inadequate technological infrastructure towards the seamless integration (mean, 2.86), lack of clear guidelines governing the ethical use of AI in education raises concerns about data security (mean, 2.59), limited resources towards AI implementation to facilitated teaching and learning and limited access to high-quality AI software due to licensing costs (mean, 2.72). The respondents however disagree with the remaining two items (item 19 and 20) as part of the factors inhibiting the integration of artificial intelligence in teaching and learning in public universities in Anambra State.

Research Question Three: What are the opportunities associated with the integration of AI in teaching and learning in public universities in Anambra State?

Table 3: Mean Ratings of the Opportunities Associated With the Integration of AI in Teaching and Learning in Public Universities in Anambra State

S/N	Items	Mean	SD	Remark
21.	Facilitates collaborative learning experiences through AI-powered online discussion forums	2.58	.72	Agree
22.	Enhance personalized learning experiences tailored to individual student needs	2.50	.61	Agree
23.	Access to vast online learning resources	2.67	.61	Agree

24. Empower academic staff with real-time data analytics to better understand student learning patterns	2.74	.71	Agree
25. Improve efficiency in administrative tasks, such as grading of student scores	2.69	.68	Agree
26. Customization of curriculum recommendations based on students' academic career goals	2.58	.69	Agree
27. Promotion of problem-solving skills through AI-supported learning activities	2.55	.75	Agree
28. Empower lecturers with AI-powered teaching assistants to help manage large class sizes	2.75	.78	Agree
29. Expansion of access to education through online learning opportunities	2.68	.75	Agree
30. Facilitate professional development opportunities for academic staff through AI-driven online training programmes	2.84	.78	Agree

The analysis in table 3 indicates that the respondents agree to all the 10 listed items as the opportunities associated with the integration of artificial intelligence in teaching and learning in public universities in Anambra State. The mean ratings for the 10 items ranged from 2.50 to 2.84.

Discussion

Findings on the study revealed that school management encourages the integration of artificial intelligence to enhance teaching and learning in public universities in Anambra State to a low extent. This is as a result of the fact that the respondents did not accept among others that the university management employs AI-based learning management systems to assist academic staff to enhance course delivery, academic staff are encouraged to incorporate AI-based educational applications into instructional delivery, and the management leverages AI for content creation to enrich learning materials. The findings is in line with Endurance et al. (2021) that the availability of AI chatbot technology for enhancing teaching and learning and administrative tasks in Universities is to a low extent. The findings is also in line with Smith, Johnson and Brown (2023) who reported a low extent of integration of AI in institution of higher learning. Smith et al. observed that despite the potential benefits, universities have been slow to implement AI-based learning management systems and educational applications due to various challenges, including resource constraints and faculty resistance to change.

Findings also revealed that many factors such as resistance to change among academics to adopt AI technologies in educational settings, concerns among senior lecturers about the potential for job displacement, insufficient training opportunities on how to effectively utilize AI tools, over reliance on traditional teaching methods, inadequate technological infrastructure towards the seamless integration, limited access to high-quality AI software due to licensing costs among others are inhibiting the integration of artificial intelligence in teaching and learning in public universities in Anambra State. The study is in agreement with the findings of Sandu (2019) who hinted that ethical concerns surrounding AI integration, particularly regarding potential biases in algorithms used for assessment and student data privacy. Teachers' anxieties

about these issues can create resistance towards adopting AI in the classroom. The findings also agreed Endurance et al. (2021) who found out that factors such as instability in government administration, inadequate budget allocation in education, and inadequate power supply inhibit the integration of AI in teaching and learning process.

Furthermore, the study revealed that there are numerous opportunities with the integration of AI in teaching and learning in public universities in Anambra State. This is as a result of the respondents accepting among others that artificial intelligence facilitates collaborative learning experiences through AI-powered online discussion forums, enhances personalized learning experiences tailored to individual student needs, and facilitates professional development opportunities for academic staff through AI-driven online training programmes. The findings is in agreement with the findings of Popenici and Sharon (2017) who revealed that artificial intelligence solutions relate to tasks that can be automated, but cannot be yet envisaged as a solution for more complex tasks of higher learning. Popenici and Sharon also revealed that AI solutions open a new horizon of possibilities for teaching and learning in higher education. However, it is important to admit the current limits of technology and admit that AI is not (yet) ready to replace teachers. Endurance et al. (2021) noted that the integration of artificial intelligence in education can enhance teaching.

Conclusion

Based on the findings of the study, it was concluded that school management encourages the integration of artificial intelligence to enhance teaching and learning in public universities in Anambra State to a low extent. Many factors such as resistance to change, concerns about potential job displacement, insufficient training opportunities among others are factors inhibiting the integration of artificial intelligence (AI) in teaching and learning, while collaborative learning experiences, access to vast online learning resources among others are the opportunities associated with the integration of artificial intelligence in teaching and learning in public universities in Anambra State.

Recommendations

On the basis of the findings of this study, the following recommendations were made:

1. University management should enhance support and training programmes to assist academic staff in understanding the importance of effectively utilizing AI-based learning management systems and educational applications for improved teaching and learning outcomes.
2. Management should consider investing in upgrading technological infrastructure and acquiring necessary software licenses to overcome challenges like inadequate technological resources and limited access to high-quality AI software, enabling a smoother integration process in public universities in Anambra State.
3. Non-governmental organizations (NGOs) and well-meaning in Nigerian are encouraged to contribute financial support towards artificial intelligence (AI) initiatives within institutions of higher learning. Recognizing the transformative potential AI offers to education in the 21st century, such funding endeavours can significantly enhance research and development in education field.
- 4.

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