



APPLICATION OF ARTIFICIAL INTELLIGENCE FOR EFFECTIVE TEACHING IN NIGERIAN PUBLIC UNIVERSITIES

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Abstract

As an educational paradigms shift towards digitalization, AI emerges as an invaluable transformative tool capable of enhancing effective teaching. Universities educational goals are adequately achieved through the application of artificial intelligence in the universities. The application of Artificial Intelligence (AI) for effective teaching in Nigerian public Universities has shown a lot of potentials to improve accuracy and timeliness of educational practices. It is against this background that this paper examined the appraisal of Application of Artificial Intelligence in effective teaching in public Universities Nigeria. The purpose of this paper was to examine the challenges and benefits of using AI technologies in teaching in the public universities. To achieve this purpose, qualitative research methods was used for the study and this provided insights into the efficacy of AI-driven educational tools, their impact on student learning outcomes, and the institutional readiness for broader AI integration. The study found out that there is a positive reception of AI-enhanced teaching tools among students and lectures. It was discovered that there is increased engagement, personalized learning experiences, and efficient assessment mechanisms. However, concerns related to data privacy, accessibility, and technological proficiency remains significant barriers to widespread AI adoption. The study concluded that adopting AI for teaching in the university will go a long way to improve teaching and learning as well as unbiased assessment of students. Recommendations made include enhancing AI literacy, infrastructure development, and policy formulation to leverage the full potential of AI in advancing educational excellence in Nigerian public Universities.

Keywords: Artificial intelligence, effective teaching, public universities

INTRODUCTION

Education is the most significant industry in Nigeria since it affects the lives of everyone either directly or indirectly, no matter the age or location. Therefore, advancement in education has an impact on university education and this plays vital roles in the growth of any nation. Hence, learning experiences can be achieved with Artificial Intelligent assisted tools and systems. Education is said to be influenced by artificial intelligence. This is because AI technologies have the capacity of making Nigeria's overcrowded educational system a smart one. It can also operate along with virtual networks to provide the ideal learning environment for both teachers and students. The significance of higher education belonging to education sector is widely recognized since "Universities are the main sources of highly qualified workforce and "knowledge and are "being instrumental in the development of societies and economies based on knowledge" (Dinu, 2011). The adoption of AI technologies in the universities seeks to enhance knowledge acquisition, leading to a surge in online learning. However, many developing nations like Nigeria currently face challenges in fully harnessing the benefits of AI due to inadequate power supply, limited access to the Internet and AI facilities. The escalating demand for education worldwide strains existing institutional infrastructure and human resources. Developing nations grapple with operational and technological challenges, impeding the integration of AI-backed learning despite its recognized advantages. This is exacerbated by financial constraints, hindering the establishment of necessary infrastructure and internet access. Adesulu, (2018), opined



that the disparity between education demand and institutional capacity results in the rejection of numerous qualified candidates thereby limiting their access to education and potential income. In Nigeria alone, where millions apply for admission, the available universities cannot accommodate the influx due to technological deficiencies

Purpose of the Study

The main purpose of this study is to ascertain application of Artificial Intelligence for effective teaching in Nigerian public Universities. The specific objectives are to:

1. Examine the benefits of using AI among for teaching by Lecturers in public Universities?
2. Find out the challenges faced by lecturers in using AI for teaching in the public Universities

Research Questions

- i. What are the benefits of the using AI among lecturers in Nigeria public Universities?
- ii. What are the challenges faced by Lecturers in the use of AI for teaching in Nigeria public Universities?

Conceptual clarifications

Concepts were clarified under the following headings, Concept of use of Artificial Intelligent, and effective teaching. Artificial Intelligence refers to the simulation of human intelligence processes by computer systems. In the context of teaching and assessment, AI technologies are employed to facilitate various educational tasks, including content delivery, student engagement, and assessment. Artificial Intelligence Systems encompass a variety of AI technologies and applications designed to support teaching and assessment in educational settings. These systems may include intelligent tutoring systems, automated grading tools, virtual assistants, and learning analytics platforms. Williams and Brown, (2022) observed that AI-based grading systems can provide consistent and timely feedback to students, reducing the workload for lecturers and promoting self-directed learning. AI platforms can be used to automate the grading process and provide instant feedback to students, saving educators' time and offering timely insights to students. Shah, and Kwok, (2022) conducted a study on AI-powered grading systems, demonstrating their accuracy and efficiency in evaluating students' assignments and providing constructive feedback. With Artificial Intelligence Systems, lecturers can easily detect originality of work using AI plagiarism detectors. AI-powered plagiarism detection tools scan students' submissions and compare them against a vast database of academic papers and online sources to identify potential instances of plagiarism. Martin & Lee, (2022), advocated that lecturers can easily detect originality of work using AI plagiarism detectors. AI-powered plagiarism detection tools scan students' submissions and compare them against a vast database of academic papers and online sources to identify potential instances of plagiarism. Also, AI platforms utilize predictive analytics to forecast students' performance and identify at-risk students who may need additional support.

In regards to Effective teaching, effectiveness involves the ability to do something or carry out a programme or ability to achieve a goal (with minimum efforts and use of scarce). Ogunyemi 2019 posit that effective goes beyond just imparting knowledge but it is a purposeful activity carried out by someone with specialized knowledge in a skilled way to enhance the cognitive, affective and psychomotor development of a person or group of persons. Therefore there is need for lecturers to be skilled in the usage of Artificial Intelligence to teach effectively so as to achieve the goals of university organizations.

Benefits of Using of Artificial Intelligent in Teaching and learning

Artificial Intelligence aids students' assessments in the universities. For example, students assessment is easily carried out on Computer based Test (CBE). Performance level of students can be predicted using a variety of machine-learning algorithms. For example, Abunasser and AL-Hiealy (2022), asserted that Machine learning techniques provide computers with the ability to learn from data



and further anticipate the future. Therefore, AI can be used for creating useful tools to solve many problems such as forecasting students enrollment, student performance evaluation, forecasting students grade point average, and other aspects of education management. With the usage of the Internet, new web-based educational tools like e-learning platforms have emerged. Examples include, Computer Based Examination (CBE), Learning Management Systems. Egielewa et al., 2022, pointed out that AI tools were served as a vital tool in during COVID-19 pandemic. However, irrespective of the various benefits that would be acquired, students would have a tutor who would instruct them at their pace while maintaining the same feeling throughout learning.

With AI, the prominence of obstacles like; distance, time, space, availability of current learning materials, cost of trip, and risk of travel have seized. Fast technological advancement is a sign that AI e-learning will inescapably play a part in raising the standard of higher education (Angibet al., 2022). AI algorithms and systems have been increasingly popular and well-known in recent times, particularly in the field of education. It must be acknowledged that some renowned private institution mandatorily use computer tablets. This could easily take the place of note books in the learning process and internet-based learning has become more common (Taylor & Clark, 2022). There is therefore no doubt that digital tools have transformed education and made learning more active and independent. Lecturers must therefore keep pace with digital developments in the universities.

Challenges facing the use of AI in teaching and Assessment

The implementation of using AI to teach in the public universities comes with cost as well as challenges for example, inadequate funds to adequately implement AI. Considering the fact that Nigeria is a developing nation, hence, the nation is far from adopting it adequately. The effective integration of AI technologies into teaching and learning is hampered by several issues. Inadequate power supply, knowledge or skills, problems with availability and accessibility, funding, inadequate professional development, unreliable internet connections, etc; all hands must therefore be on deck by stakeholders in the education sector like educators, policymakers, curriculum planners, and students must work together to overcome these obstacles (Enang, 2022). In the same vein, Johnson, and Smith, (2022) asserted the potential of AI-powered chatbots in providing instant feedback and support to students, enhancing their learning experience outside traditional classroom settings. Furthermore, Chen, and Liu, (2023) emphasized the use of AI in creating interactive simulations and virtual laboratories, enabling students to engage in hands-on learning experiences remotely. These AI-driven platforms have been shown to increase students' understanding of complex concepts and foster critical thinking skills.

Methodology

This study adopted descriptive research design. The population comprise lecturers from Nasarawa State University Keffi, (North –Central), Ambrose Alli University Ekpoma, (South-South), Federal University Kashere, (North-West), Federal University, Dutsinma (North –East), Lagos State University (South-West) and Imo state University, Owerri (South-East). The Convenience sampling technique was used based on lecturers' availability and willingness to take part in the respondents. The instrument for collecting data in this study was the structured questionnaires designed by the researcher titled Artificial Intelligence Questionnaires for teaching in public Universities in Nigeria. The reliability of the instrument was determined using the test re-test method while the validity was determined using Pearson Product Moment Correlation Coefficient which yielded a coefficient of 0.67. This showed that the instrument was valid to be used for the data. The statistical tool for analyzing data was the descriptive statistics (simple mean).



Analysis of Data

Research Question 1: What are the benefits of the using AI among lecturers in Nigeria public Universities?

Table:2 Benefits of AI to teach among Lecturers in Public Universities in Nigeria

S/N	Item	MeanSD	Criterion	Decision	
1	AI helps to Detect Plagiarism	4.62	.512	3.00	Agree
2	AI Enhance personalized learning	4.63	.483	3.00	Agree
3	AI helps in Unbiased Assessment	4.60	.505	3.00	Agree
4	AI helps to engage Students and increases social interactions	4.66	.475	3.00	Agree
5	AI takes the place of lecturers	2.00	.682	3.00	Disagree
6	AI enhances easy learning and Improves students performance.	4.61	.490	3.00	Agree
7	AI enhances generating contents	4.67	.473	3.00	Agree

Source: Field Study, 2024

Data presented on the benefits of AI used for teaching by the lecturers in the public university in Table 1 above, showed that items 2 -4 and 6-7 were agreed or accepted by the respondents. This is evident as individual mean scores of 4.62, 4.63, 4.60, 4.66, 4.61 and 4.67 were more than the criterion mean of 3.00 while item 5 was disagreed or rejected by respondents as the mean scores of 2.00 was less than the criterion mean of 3.00. These shows that majority of the lecturers agreed on the benefits of using AI for teaching.

Research Question 2: What are the challenges faced by Lecturers in the use of AI for teaching in Nigeria public Universities?

Table 2: Challenges of Using AI in teaching in Public Universities in Nigeria

S/N	Item	Mean	SD	Criterion	Decision
1	Technical issues while using AI	4.62	.526	3.00	Agree
2	Difficulty in providing technical support to Lecturers using Artificial Intelligence to teach	4.56	.498	3.00	Agree
3	Inefficiency of power and powering system	3.62	.573	3.00	Agree
4	Cost of data and internet facilities	3.65	.574	3.00	Agree
5	Inadequate infrastructure	3.67	.497	3.00	Agree
6	Poor basic digital literacy skills	4.58	.521	3.00	Agree
7	Poor funding of the system	3.80	.446	3.00	Agree

Source: Field Study, 2024

Table 2 revealed that the respondents agreed and accepted all the items measuring the challenges of Artificial intelligence in teaching by lecturers in public Universities as the individual mean scores were more than the criterion mean of 3.00. These therefore showed that the major challenges of AI identified in the public universities include; technical issues, difficulty providing technical support to lecturers using Artificial Intelligence tools, Inefficiency of power and powering systems, difficulties in engagement using Artificial Intelligence teaching, cost of data and internet facilities, inadequate of infrastructure, poor basic digital literacy skills and Poor funding of the system which all recorded high mean scores.



Findings

Based on the study, findings include; AI helps to detect plagiarism, AI enhance personalized learning, AI helps in unbiased Assessment, AI helps to engage Students and increases social interactions, AI takes the place of lecturers functions, AI enhances easy learning and improves students performance. AI enhances generating contents.

Secondly, the challenges of lecturers using Artificial Intelligence include; Technical issues while using AI, There is difficulty in providing technical support to lecturers using Artificial Intelligence to teach, inadequacy of power and powering system; cost of data and internet facilities, inadequate infrastructure, poor basic digital literacy skill and poor funding of the system

Recommendations

- i. Public Universities Management in Nigeria must adequate internet facilities and AI facilities to alleviate the cost burden of the lecturers using AI.
- ii. Public University management must improve on the quality of power supply and system
- iii. Public University management should must ensure adequate training of lecturers and students for adequate usage of AI
- iv. Public universities management in Nigeria must provide adequate funds for adequate implementation of AI.
- v. The government can also intervene by providing adequate funds to public universities to meet the demands of using Artificial Intelligence.

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