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Abstract

This study examined impact of artificial intelligence (AI) in teaching and learning in Nigeria University. Two research questions and two hypotheses guided the study. the study adopted descriptive survey research design. The population of the study is 3604 teaching staff from tertiary institutions in Imo State. The simple random sampling technique was employed and the sample size was 232 which was 6% of the population. The instrument was questionnaire. The instrument was face and content validated. The use Chronbach Alpha formula for the instrument showed a reliability coefficient of 0.81 obtained. The data collected from respondents was analyze using Mean and Standard Deviation while the hypotheses were tested using t-test Statistics at 0.05 level of significant. It shows applying artificial intelligence will encourage students to discuss issues concerning research and academics. Artificial intelligence can enhance lecturer assessment skills in monitoring students' progress toward meeting desired levels of proficiency. Professional development and training programs should be provided for educators to build their capacity for effectively integrating AI tools and resources into subject instruction, assessment, and curriculum development.

Key words: Artificial Intelligence, Teaching and Learning

Introduction

Education is the cornerstone of a nation's culture and an absolute necessity for economic and social prosperity and development. There is hardly any household in this country that is not concerned about the state of education system particularly the tertiary education. However, higher education is a developmental programme that liberates the ingenuity of the mind and thereby holding the key to unlocking the development of human and material resources. According to section 8(58) of the National Policy on Education of Federal Republic of Nigeria (FRN, 2013), tertiary education is the education given after secondary education

either in universities, colleges of education, polytechnics, monotechnics including those institutions offering correspondence courses.

One of the goals of such tertiary education is to acquire both physical and intellectual skills which will enable individuals to be self-reliant and useful members of the society. Tertiary institutions of learning were also vested with the responsibility of providing skilled and high-level workforce for the economy. An important goal of tertiary education as an institution of higher learning is to enrich and develop ones potentials to positively connect within the society and promote nation building. The importance of tertiary education is to provide quality education for her products so that they can assume leadership positions in their immediate and external communities (Federal Republic of Nigeria (FRN), 2013).

In order for tertiary education to actualized its stated goal and objectives, in the 21st century, there is need to incorporate the service of technology so as to achieve quality standard in the education. The goal achievement of a university education might depend on several factors, but it seems integration of technology in universities is essential, because it will help to improve the knowledge, skills and ability of the Nigeria students. In the last few decades, technology has occupied a commanding position in almost every aspect of human life. Humans cannot imagine a single day without technological interference. The emergence of artificial intelligence (AI) brings new possibilities as well as new challenges to the teaching-learning process (Sen, 2021). Teaching and learning has upgraded from the traditional way to a more innovative way using artificial intelligent.

Artificial intelligence (AI) is the impersonation of human knowledge procedures, for example, discourse and visual acknowledgment, interpretation of the dialects and virtual decision making by machines and robots. Tuomi (2018) writes that artificial intelligence is often defined as a computer system with the ability to perform tasks commonly associated with intelligent beings. Artificial intelligence (AI) is a promising new tool that can be used to improve learning and teaching processes as technology develops.

Artificial intelligence also known as AI, may be defined as ‘man-made thinking power’, in which artificial means ‘man-made’ and intelligence means ‘thinking power’ (Choudhury, 2022). With its ability to customize lessons, enhance learning opportunities, and provide educators and students with cutting-edge tools and resources, artificial intelligence (AI) has the potential to completely transform the educational landscape in terms of both teaching and learning effectiveness.

Therefore, integration of Artificial Intelligence (AI) in education has gained significant attention in recent years due to its potential to revolutionize teaching and learning practices. AI can facilitate personalized learning experiences, enhance student engagement, and improve educational outcomes, particularly in any given of students’ specialization in tertiary institution (Fernandez et al., 2019). However, the successful implementation of AI technologies in educational settings largely depends on the perceptions and attitudes of lecturers, who play a crucial role in the adoption and integration of these technologies

(Thomas et al., 2022). The progress and success of any higher institution depend on the effectiveness of the lecturers in managing students' academic performance.

Understanding university lecturers' perceptions of AI is crucial because they are at the forefront of implementing and observing the outcomes of AI applications in education. Their insights can provide valuable information on the practical benefits and challenges of AI integration in teaching and learning processes. AI-powered tutoring systems can provide students with immediate feedback, guidance, and support, allowing them to learn at their own pace and freeing up lecturers to focus on more complex tasks. The impact of AI on student academic performance cannot be over emphasized. Academic performance entails the different means students respond to their academic materials assigned by their teachers/lecturers. This explains that high academic performance is directly connected and measured by the examination results.

Specifically, AI applications in the form of automated assessment and tutoring tools use machine learning and natural language processing to evaluate students continue assessment, work and provide timely feedback (Bai & Stede, 2022). These tools aim to reduce the workload on lecturers and offer immediate feedback to students, thereby enhancing the learning process (Tubino & Adachi, 2022).

Consequently, the introduction of AI in education has pose serious challenges on the mental reasoning and knowledge of human. Many lecturers do not rely on their intellectual ability, cognitive domain to solve critical academic issues rather the depend on the results given by AI. Despite the potential benefits of integrating Artificial Intelligence (AI) into education, particularly in the realm of students' assessment and academic performance, challenges persist. Issues related to data privacy, bias, and the need for human oversight pose significant concerns. This, therefore, necessitates the need to examine the various application of AI tools in classroom assessment, highlighting the collaboration between AI and lecturers in addressing associated challenges and providing practical strategies to enhance AI utilization in education, particularly in classroom assessment and students' academic performance. It against this background the paper address the impact of AI in teaching and learning in Nigeria Universities.

Statement of the Problem

Despite the rapid advancement in educational technologies, many schools continue to operate within traditional frameworks that do not fully leverage the potential of Artificial Intelligent (AI). AI is characterized as valuable insights into student performance through learning analytics, enabling educators to identify areas where students may be struggling and provide timely interventions. However, the adoption and effective implementation of artificial intelligent systems remain inconsistent, particularly in tertiary institutions in Imo State for the improvement of effective teaching and learning on students' academic performance. Numerous schools' lecturers face challenges in their use of AI in the assessment of students' academic performance, because of limited financial resources. Based

on this observed problem the study pose as question is: what ways is IA used in improving students' academic performance.

Purpose of the study

The main purpose of the study is to investigate impact of AI in teaching and learning in Nigeria Universities. Specifically, the study set to achieved the following;

1. determine the ways artificial intelligent can be used to improve students' academic performance in university in Imo State.
2. ascertain the ways artificial intelligent can improve lecturers' assessment skills in universities in Imo State

Research Questions

The following research questions were pose to guide the study

1. What ways do artificial intelligent used to improve students' academic performance in university in Imo State?
2. What ways do artificial intelligent used to improve lecturers' assessment skills in university in Imo State?

Hypotheses

The following hypotheses formulated guided the study at 0.05 level of significance:

H₀2: There is no significant difference in the mean responses of male and female respondents on the way artificial intelligent are used to improve students' academic performance in university in Imo State

H₀2: There is no significant difference in the mean responses of male and female respondents on the way artificial intelligent are used to improve lecturers' assessment skills in university in Imo State

Concept of Artificial Intelligence

The phrase "artificial intelligence" (AI) now refers to a broad range of technologies that underpin many of the products and services that people use on a daily basis, such as chatbots that offer real-time customer care and applications that suggest TV series. Artificial intelligence, or AI, is a technology that, when used alone or in conjunction with other technologies, allows computers and other machines to mimic human intelligence and problem-solving abilities. Tasks that would normally require human intelligence or intervention can be completed by AI.

Moreover, Copeland (2024) defined artificial intelligence (AI) as the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. Bassey and Owushi

(2023) defined artificial intelligence (AI) as “the development of computer systems that can perform tasks that typically require human intelligence.”

Additionally, Laskowski (2024) mentioned that artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition, and machine vision. In a number of areas, AI can perform tasks much better than humans. Kanade (2022) described artificial intelligence (AI) as the intelligence of a machine or computer that enables it to imitate or mimic human capabilities. AI uses multiple technologies that equip machines to sense, comprehend, plan, act, and learn with human-like levels of intelligence. Fundamentally, AI systems perceive environments, recognize objects, contribute to decision-making, solve complex problems, learn from past experiences, and imitate patterns.

Concept of Teaching

Teaching effectiveness is the capability of teachers to teach in such a manner that they achieve success and bring about the desired change in the students' behavior. Umo (2013) as cited in Nyarks and Okey-Agbo (2023) stated that they are difficulties hindering learning. Hence, the need for teachers' dispositions and effectiveness, which determine the quality of a teacher's performance. According to Hawthorne (2022), teaching effectiveness is the knowledge, strategies, processes, and behaviors of teachers that lead to good student outcomes. The Australian Institute for Teaching and School Leadership (2012) defined teaching effectiveness as “both the quality of teaching and the capability of teachers.” Teaching effectiveness requires teachers to continually enhance practice by adopting an evaluative mindset.

Teaching effectiveness is informed by growth-focused evaluations of teaching practice, indicators of learning and wellbeing, and a positive school culture. Furthermore, Little, Goe, and Bell (2009) mentioned that teaching effectiveness is a teacher's ability to produce gains on student achievement scores, taking account of a baseline measure of students' prior attainment and other characteristics of student intake. According to Jupp (2009), teaching effectiveness is defined as the “practical outputs of teaching.” These outputs are quantitative—student learning, as calculated by value-added assessments (which measure how much a specific teacher improves an individual student's learning) or other rigorous measures. And they are qualitative—observations of a teacher's classroom performance by a principal or peer who understands the classroom practices that improve student achievement.

Concept of Learning

When designing learning programs, effectiveness is a very important factor to consider. When learners can retain and access information over long periods of time, it is indicative of effective learning processes. According to Goel (2023), learning effectiveness refers to the ability of a learning program to achieve its intended learning outcomes and produce the desired results. In that sense, a learning-effective program focuses on the quality

of learning and the application of that learning to impact performance. An effective program does that by keeping learners engaged, motivated, and participative. Effective learning refers to a teaching and learning process that not only focuses on the results achieved by students but also emphasizes the understanding, intelligence, perseverance, and quality of learning. It involves creating a comfortable and conducive learning environment, providing necessary facilities and resources, and incorporating research components into the curriculum.

Effective learning is characterized by the ability to generate positive feelings and favorable attitudes towards learning, which in turn promotes active engagement and proactive behavior in the learning situation. It also involves strategies such as interrogating information, thinking it through, and organizing and linking concepts (SciSpace, 2023). Hawthrone (2022) mentioned that learning effectiveness is the knowledge, strategies, processes, and behaviors that lead to good student outcomes. Teacher effectiveness has a positive impact on their students, and they use their expertise to improve learning. These good outcomes are often those that can be measured easily, usually through summative assessment. Effective teaching is constantly recognized as one of the key drivers of school improvement. Learning effectiveness helps students achieve their goals, both personal and academic. It is well known that effective teachers can be hugely influential figures for many young people, providing them with both certainty and assurance when they need it the most.

Impact of AI on Students' Academic Performance

Students' performance can be measured by giving tests. Through evaluation or testing, evidence of growth and progress of learners towards desired outcomes. Student' performance in school depend to great extent on the management of schools' available resources in terms of physical, human, material and financial resources towards the achievement of educational goals. Umoh, cited Neha and Kumar (2022) defines student' academic performance as the final grade which students get after a systematic and comprehensive measurement and evaluation of the individual student in a school setting for the purpose of making decision or judgment on his/her cognitive, affective and psychomotor domains.

Learning using this AI system is learning that has been modified so that it can improve learning achievement and student focus. This is because AI has the advantage of teaching students individually and marking the desired problem to find the correct and appropriate way of teaching students using artificial intelligence technology. Artificial Intelligence (AI) holds great promise for transforming teaching processes by enhancing student achievement, providing personalized learning experiences, and improving educators' efficiency (Dwivedi et al., 2021; Haseski, 2019).

Impact of AI on Lecturers' Assessment Skills

AI does not impact only the teaching and learning process but also assist in improving the assessment and grading skills of the students. Classroom assessment refers to the process in which lecturers and students gather, interpret and use evidence of student learning for a

variety of purposes, including diagnosing students' strengths and weaknesses, monitoring students' progress toward meeting desired levels of proficiency, assigning grades, and providing feedback to parents' (McMillan, 2018).

Various AI-powered tools such as digital assessment tools, formative assessment tools and classroom response systems among others can help to improve classroom assessment using software like Edulastic, Exam View, Mentimeter, Socrative and Top Hat among others. These tools provide educators (lecturers) with valuable knowledge of students' performance, learning outcomes, and instructional effectiveness. For instance, AI-powered formative assessment tools can analyze student responses to assignments and provide individualized feedback which help lecturers identify areas of students' strengths and weaknesses (Nazaretsky et al., 2022). These AI tools can also provide lecturers with insights into the effectiveness of their instruction and identify areas where they may need to adjust their teaching strategies while teaching in the classroom.

Methodology

The study adopted descriptive survey design. This design was considered most appropriate for the study because a survey design, utilizes questionnaire, observations, tests, and interviews as tools in obtaining information. The population of the study was made up of 3604 teaching staff from university in Imo State. The simple random sampling method was employed to select 232 teaching staff drawn from the population. The sample was derived using proportionate random sampling techniques. The academic staff are chosen because they play major roles in the implementation of teaching and learning in tertiary institution environment. The instrument for data collection was a questionnaire, validity of research instrument was determined by three specialists two, the copies of the instrument were administered to 30 undergraduate students of public universities in Imo State. With compute reliability co-efficient of instrument using the Cronbach Alpha statistics overall reliability coefficient of 0.81. The instrument was administered to respondents by the researcher, completed copies of the questionnaire were correctly checked to ensure their level of completeness by the respondents. The mean and standard deviation was employed in answering the two research questions on a benchmark of 2.50; while t-test statistic was employed in testing the two null hypothesis formulated at 0.05 levels of significance. The hypothesis was based on 0.05 level of significance. Therefore, when any calculated value is higher than 0.05, the null hypotheses was accepted and when any calculated value is lesser than 0.05, the null hypothesis was rejected.

Presentation of Data and Discussion of Results

Research Question One

What ways are artificial intelligent used in improving students' academic performance in university in Imo State?

Table 1.1: Mean and Standard Deviation responses on the ways artificial intelligent are used to improve students' academic performance in university in Imo State. (N=232)

N/S	Statement	X	SD	Remarks
1.	Using artificial intelligence in learning encourages students to discuss issues concerning their academics	2.92	0.94	Agreed
2.	Students can apply artificial intelligence in philosophy of education teamwork and assignments using Twitter	2.93	0.92	Agreed
3.	Students can use artificial intelligence in carrying out collaborative assignment	3.08	0.86	Agreed
4.	Artificial intelligence enable students to check the academic activities	2.96	0.87	Agreed
5.	Students can access high quality research material using artificial intelligence	2.99	0.88	Agreed
6.	Artificial intelligence enable students to search for any topic of their choice, join other great group available using artificial intelligence	3.02	0.86	Agreed
7.	Artificial intelligence help students to understand a knowledge application to problem stating.	3.02	0.82	Agreed
8.	Artificial intelligence assist students to seek assistance from experts in their field, hence impact their academic performance.	3.04	0.88	Agreed
9.	When philosophy of education students applies artificial intelligence responsibly, it can improve their academic performance.	3.09	0.83	Agreed
10	Artificial intelligence serves as a source of inspiration and motivate the philosophy of education students in research	3.07	0.83	Agreed
Cluster Mean/SD		3.01	0.89	Agreed

Table 1.1 revealed that respondents agreed to the items measuring the ways artificial intelligent is used in improving students' academic performance in university in Imo State this is reflected in the mean score of 3.01 and 0.89 which is above the mean benchmark of 2.50 for region of acceptance. Hence, it is safe to say that Artificial intelligence application do influence students' academic performance.

Research Question Two

What ways do artificial intelligent used to improve lecturers' assessment skills in university in Imo State?

Table 1.2: Mean and Standard Deviation responses on the ways artificial intelligent used in improving lecturers' assessment skills in university in Imo State. (N=232)

N/S	Statement	X	SD	Remarks
1.	Helps lecturers to ensure fairness in grading students assessment,	2.71	0.91	Agreed

2.	Help automate many aspects of classroom assessment processes	2.95	0.85	Agreed
3.	Saving time and reducing the burden on lecturers in assessment	2.92	0.92	Agreed
4.	Help lecturers to identify students at risk of falling behind or those that need remediation	2.84	0.93	Agreed
5.	Assist in analyze students' data, such as test scores and attendance records.	2.82	0.97	Agreed
6.	Artificial intelligence enhance lecturers assessment skills on monitoring students' progress toward meeting desired levels of proficiency	2.81	0.93	Agreed
7.	Artificial intelligence helps to improve lecturers' assessment skill using software like Edulastic.	2.88	0.94	Agreed
8.	Artificial intelligence assist lecturers identify areas of students' strengths and weaknesses.	2.34	0.86	Disagreed
9.	Artificial intelligence help to identify areas where they may need to adjust their teaching strategies while teaching in the classroom.	3.01	0.83	Agreed
10	Artificial intelligence improves lecturers' classroom assessment process's efficiency and effectiveness.	2.51	0.85	Agreed
Cluster Mean/SD		2.78	0.90	Agreed

Table 1.2 revealed that respondents agreed to nine items measuring the ways artificial intelligent are used to improve lecturers' assessment skills in university in Imo State. Also this is reflected in the mean score of 2.78 and standard deviation of 0.90 which is above the mean benchmark of 2.50. It also showed that the respondents were not far apart in their responses. Hence, artificial intelligence impact lecturers' assessment skills.

Hypothesis One

Ho₁: There is no significant difference in the mean responses of male and female respondents on the way artificial intelligent are used in improving students' academic performance in university in Imo State

Table 1.3: t-test Analysis of Male and Female Respondents' Mean Ratings on way artificial intelligent are used to improve students' academic performance in university in Imo State

Variable	N	Mean	SD	df	α	t-cal	p-value	Decision
Male	76	3.09	0.39	230	0.05	-.315	0.77	Not Significant
Female	156	3.01						

Data presented in Table 1.3 showed the t-test statistical analysis between male and female undergraduate students with regards to way artificial intelligent are used in improving students' academic performance. The observed t-cal is -256 while 0.77 is p-value. Consequently, the critical t-value of 1.96 is greater than the observed t-value and the p-value is also greater than the alpha value of 0.05, hence, the null hypothesis is accepted. Therefore, there is no significant difference between the mean response of male and female students on the way artificial intelligent are used in improving students' academic performance.

Hypothesis Two

Ho₂: There is no significant difference in the mean responses of male and female respondents on the way artificial intelligent are used to improve lecturers' assessment skills in university in Imo State

Table 1.3: t-test Analysis of Male and Female Respondents' Mean Ratings on way artificial intelligent are used to improve lecturers' assessment skills in university in Imo State

Variable	N	Mean	SD	df	α	t-cal	p-value	Decision
Male	76	2.67	0.97	230	0.05	-.292	0.68	Not Significant
Female	156	2.78						

Table 1.4 showed the t-test statistical analysis between male and female on the way artificial intelligence are used in improving lecturers' assessment skills. From the Table, the observed t-cal was -.417 while the p-value was 0.68. Accordingly, the t-critical of 1.96 observed t-cal and alpha value of 0.05, thus, the hypothesis of no difference was accepted. Therefore, there is no significant difference between the mean response of male and female on the way artificial intelligence are used to improve lecturers' assessment skills.

Discussion of Findings

The findings of research question one showed the ways artificial intelligence are used in improving students' academic performance. From the findings it was also revealed that applying artificial intelligence will encourage students to discuss issues concerning research and academics. This finding is in line with the findings of Chen, (2022) who state that AI, can improve student achievement during the teaching and learning process in the classroom, especially at the senior high school level. Findings from hypothesis one revealed that there is no significant difference between the mean response of male and female on the ways artificial intelligent are used in improving students' academic performance. This finding aligned with Lenandlar (2020) who noted that artificial intelligence has been used by students in education for various purposes which do influence their ways of doing things and by extension, networking with regards to academic activities.

The findings of research question two revealed ways artificial intelligence are used to improve lecturers' assessment skills. From the findings it was also revealed that Artificial intelligence can enhance lecturer assessment skills in monitoring students' progress toward meeting desired levels of proficiency. The finding of this study is in corroboration with the findings of Nazaretsky et al., (2022) who opined that AI tools can also provide lecturers with insights into the effectiveness of their instruction and identify areas where they may need to adjust their teaching strategies while teaching in the classroom. Finding from hypothesis two revealed that there is no significant difference between the mean response of male and female students on the way artificial intelligent are used to improve lecturers' assessment skills.

Recommendations

The following recommendations were made from the findings that:

1. Government and the relevant authorities should consistently make the utilization of artificial intelligence for learning in university a necessity;

2. Professional development and training programs should be provided for educators to build their capacity for effectively integrating AI tools and resources into subject instruction, assessment, and curriculum development

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