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Artificial Intelligence and the Future of Interactive Teaching and Learning: Exploring the Experience of Nigeria University Lecturers

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ABSTRACT

This study investigated artificial intelligence and the future of interactive teaching and learning: exploring the experience of Nigeria University lecturers. The study was based on mixed methods approach and concurrent mixed-method research design was adopted. The population of the study comprised all lecturers in both private and public universities in Nigeria across all disciplines. Using random sampling technique, 60 lecturers each from six universities in North and South zone was selected as the sample for this study. Methods of data analysis adopted were thematic, frequency and percentages statistics. The findings among others revealed that Google Classroom ranked first with a percentage score of 53.12 was the most utilised AI tool among lecturers while Microsoft Team with a percentage score 12.79 was the least adopted; and internet accessibility with a percentage score of 59.67 was the predominant challenges faced by lecturers in Nigerian universities while resistance to change with a percentage score of 6.23 was the least challenge among lecturers in Nigerian universities. Based on the findings of the study, it was recommended among others that lecturers should sustain their effort in the use of Google Classroom and explore other options of AI tool like ChatGPT, Learning Management System, Google Meet as well as Zoom; and universities should make concerted efforts to provide internet accessibility to lecturers as well as students to promote the adoption of AI among lecturers as well as students in the University.

Introduction

Artificial Intelligence (AI) is rapidly changing the face of educational systems around the globe. Today, virtual classroom, AI inclusive classrooms, instructional module which contains activities such as quiz and instructional slide shows based on lecturers notes and recordings are seen to be part of today's teaching realities. In fact, the 2020 corona pandemic experience has also led to a great extent, the need for virtual classroom. As the corona episode lasted, it was a timely innovation to note, classes were not missed and education did not suffer too much from the pandemic. Snowballing from these episodes and experiences is the popularization of virtual teaching where access to internet and availability of necessary software application replaces the need to be in a physical classroom. Also, the ever increasing demands for university education, leading to increase university enrolment over the years, without corresponding expansion in the

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classroom infrastructure make the need for technological innovation for non-interactive instructional deliveries across naturally populated classrooms, inevitable. AI tools are expected to play significant role in instructional delivery and also in test administration.

The integration of AI in education, no doubt presented a new experience and opportunities to enhance interactive teaching and learning across Nigeria higher institutions of learning. These facts are even made more significant with the current conditions of higher education in Nigeria, where universities are faced with the challenges relating to limited resources, large class sizes, and inconsistent access to technology.

Interactive teaching and learning is about active engagement, participation and collaboration between the teacher and the learners in the learning process, assisting the learner to be more involved in the process of knowledge acquisition. When AI is incorporated to the teaching and learning activities, it is expected that AI technology has the potential to enhance the learning outcome among the learners. Zawacks-Richter, et al. (2019) opined that researches as demonstrated that AI can assist in vocational institutional (tailoring) proceeding initiate factor and fostering a more collaborative learner-centred environment.

AI when incorporated to teaching and learning situation can support interacting learning in many ways, such as; its ability to enable personalized learning pathways. AI algorithms assist to analyse learners' strength and weakness, learning preferences and also adjust accordingly to learning content to suite learners. Research studies have suggested that personalized AI-driven learning can lead to improved engagement and good understanding of learning content (Homes et al., 2019).

However, the integration of AI in Nigeria universities also presents a unique challenge, particularly in how lecturers adapt to these technologies for interactive and instructional delivery. Hence this research study seeks to explore the experiences of Nigeria university lecturers in utilizing Ai to enhance interactive teaching and learning environment; in a way to access the future potential of AI in higher education in Nigeria.

Statement of the Problem

Despite the growing popularity of AI integration to education around the globe, there is a hinted research on the utilization and impact of AI in Nigeria university education, particularly enhancing interactive teaching and learning environment. Nigeria university lecturer have keyed to the successful integration of AI into educational practices. But the lecturers to a very large extent often are faced with the barriers such as inadequate infrastructure, lack of adequate specialized teaching training, and concerns over the effectiveness of AI replicating human element of institution. This study aims to address these gaps by exploring what challenges Nigerian lecturers faced in the integration of AI and the lecturers' perspective on the future role of AI in transforming interactive situation.

Objectives of the Study

The objectives of thus research are:

1. To explore the current AI tool used by Nigerian lecturers in interactive teaching and learning situation in the universities.
2. To identify the challenges universities lecturers face when using AI in their teaching practises.
3. To assess lecturers' perception of the future potentials of AI in enhancing interactive teaching and learning.

Research Questions

1. What are the AI tools currently being used by lecturers in Nigerian universities for interactive teaching and learning situations?
2. What are the challenges faced by Nigerian university lecturers in the use of AI for their teaching practices?
3. What is the perception of Nigerian university lecturers regarding the future of potentials regarding the future potentials of AI in enhancing interactive teaching and learning?

Literature Review

This section of study represents the review of existing literatures on the role of AI in educational, with specific focus on the integration of AI in interactive teaching and learning.

Interactive Teaching and Learning with AI Inclusion

Interactive teaching and learning situation, is an explanation of a teaching and learning environment where teachers and students engage interactively with each other and also with other learning materials to create a more dynamic and participating learning experience. This teaching and learning situation often emphasizes dialogue, collaboration and practical activities, thus giving the student a deeper and better understanding of the subject matter. Freeman et.al (2014) maintained that interactive instructional delivery

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enhances students understanding and retention of learning content and also reduces failure rate, especially in challenging subjects. Additionally, Cavanagh et.al (2016) which is study focused or flipped classroom method- where students reviewed contents before engaging with the teacher during class. The study found that students reported higher level of engagement and motivation, as greater satisfaction with the learning process. Interactive teaching and learning also enables immediate feedback and support, which are crucial for maintaining students' motivation to learning (Deslauriers et.al., 2011).

Basically, interactive teaching and learning situation includes: two-way communication, active participation, collaborative learning, problem solving and critical thinking, use of technology and multimedia and flexible and adaptive learning method.

Interactive teaching and learning wit AI inclusion would help make education more engaging, increase student motivation and enhance retention and understanding. This could be made possible through similarities, projects and case studies that are more effective using AI. Pane et al (2014) opened that AI can foster academic growth by customizing students learning paths. This will encourage the students to engage with the learning materials more deeply and persistently. This level of personalized learning helps prevent student disengagement, especially among students who are struggling to keep up with standard of instructions in higher institution.

Challenges Faced by Nigerian Lecturers in Adoption and Utilization of AI for Interactive Teaching Delivery

AI powered instructional tools such as chatbots, virtual tutors and adaptive quizzes when used for teaching delivery, contributes to increase students' engagement by creating interactive, responsive learning environment. Chen et al. (2020) conducted a research in virtual assistants in classroom, and the outcome shows that the tools can sustain students' interest and provide extra support outside of the class time.

Even though the inclusion of AI in interactive teaching delivery demonstrated significant potentials, there are relative challenges particularly regarding data privacy, algorithmic transparency, and the risk of consistent dependency. Perrotta et al. (2021) expressed that, while students appreciated the personalised and engaging aspects of AI tool, some display concerns about data privacy and felt that relying too heavily on AI could limit critical thinking and certainty. Teachers also face challenges in adapting to AI teaching tools, which often time require training and adjustments in teaching practices. Thus, institutions implementing AI inclusion in teaching practices need to ensure transparency and promote a balanced use of AI, thus, making the student to work with the tool and also relating well with other agency of learning. Perrotta et al. (2021) emphasize the importance of balancing AI driven in structural delivery with ethical consideration and promoting human central learning.

Methodology

The study was based on mixed methods approach. The research design adopted was a concurrent mixed-method research design which allows researchers to collect both forms of data at roughly the same time and then integrate the information in the interpretation of the overall results (Cresswell & Cresswell, 2018). It combined qualitative and quantitative data collection techniques to provide a comprehensive understanding of the experiences of Nigerian universities lecturers.

The population for the study comprised all lecturers in both private and public universities in Nigeria across all disciplines. Using random sampling technique, 60 lecturers each from six universities in North and South zone was selected as the sample for this study. A questionnaire titled Artificial Intelligence Questionnaire (AIQ) was used to collect the quantitative data for this study while a structured interview was used to obtain to qualitative data for this study. The questionnaire was validated by giving the questionnaire to experts in the field and the experts' views and recommendations were incorporated in the instrument. The researchers' uses online survey (Google Form) for the administration of the questionnaires and all ethical guidelines such as confidentiality among others are duly given adequate attention.

Table 1: Qualitative Data Codification

S/N	Themes
1	Theme One: AI tools currently being used by lecturers
2	Theme Two: Challenges faced by Nigerian university lecturers in the use of AI
3	Theme Three: Perception of Nigerian university lecturers regarding the future of potentials of AI in enhancing interactive teaching and learning

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Methods of data analysis adopted were thematic, frequency and percentages statistics. The quantitative data for this study was analysed using Statistical Package for Social Sciences (SPSS) Software while manual transcription was used for the qualitative data.

Results and Discussions

This section presents the data analysis results and discussion of the findings of the study. Frequency, percentages and thematic were used for the purpose of data analysis.

Research Question 1: What are the AI tools currently being used by lecturers in Nigerian universities for interactive teaching and learning situations?

Table 2: AI tools currently being used by lecturers in Nigerian universities

Items	Frequency	Percentage	Rank
Google Classroom	162	53.12%	1st
Microsoft Team	39	12.79%	4th
ChatGPT	58	19.02%	2nd
Zoom with AI integration	46	15.08%	3rd
Total	**305**	**100%**	

Table 2 revealed the AI tools being used by lecturers in Nigerian universities. Based on the result of this study, it was revealed that Google Classroom ranked first with a percentage score of 53.12 was the most utilised AI tool among lecturers while Microsoft Team with a percentage score 12.79 was the least adopted tool among lecturers in Nigerian universities.

Research Question 2: What are the challenges faced by Nigerian university lecturers in the use of AI for their teaching practices?

Table 3: Challenges faced by Nigerian university lecturers in the use of AI

Items	Frequency	Percentage	Rank
Limited Infrastructure	46	15.08%	3rd
Internet Access	182	59.67%	1st
Resistance to Change	19	6.23%	4th
Lack of ICT gadgets among students	58	19.02%	2nd
Total	**305**	**100%**	

Table 3 showed the challenges faced by Nigerian universities lecturers in the use of AI for their teaching practice. Based on the result of this study, it was revealed that internet accessibility with a percentage score of 59.67 was the predominant challenges faced by lecturers in Nigerian universities while resistance to change with a percentage score of 6.23 was the least challenge among lecturers in Nigerian universities.

Additional Evidences from Qualitative Approach

Theme One: AI Tools Currently being used by Lecturers for Interactive Learning

Base on the data obtained from the participant which was transcribed on AI tools currently being used by lecturers for interactive learning. The findings were provided below;

> "*AI tool has been helpful and has eased the pressure on some of the instructional areas. Some of the AI tools often adopted are ChatGPT prompt as well as Meta-Installed AI which has been helpful in highlighting of points in major concepts and constructs on which further research can be done. In addition, Google Meet has been helpful and zoom classroom experiences has been great. In data analysis, ChatGPT has been helpful and the result has been clear, understanding and factual. Recently, ChatGPT has been a great tool in the analysis of qualitative data. LMS has also been popular with numbers of features that assist the lecturers to paste their modules on the platform for accessibility of all the learners, giving of students' assignment, marking of attendance and monitoring of students' performance*".

Theme Two: Challenges Faced in the use of AI for their Teaching Practices

Based on the data obtained from the participants which was transcribed on challenges faced by lecturers in the use of AI for their teaching practice, the results of the challenges were provided below;

"According to the participants, *there are numerous challenges in the use of AI. The participants noted the difficulty in the installation of AI tools due to inaccessibility of authentic tools and some due to high cost of subscription fee. It was further noted that internet accessibility and connectivity are other challenges lecturers faced in the use of AI. In addition, it was deduced that technical know-how and ethical compliance are some of the challenges in the use of AI. Additionally, it was observed that there is no formal training and orientation to guide lecturers in the ethical use of AI and some lecturers prefer using their traditional mode of doing things as they considered it easy and used to those means. Other challenges that creates fear in the use of AI is the data privacy and accessibility of people to the data personalised and highly classified data"*

Theme Three: Perception of Lecturers Regarding the Future Potentials of AI in Enhancing Interactive Teaching and Learning

Base on the data obtained from the participants which was transcribed on perceived future potentials of AI in enhancing interactive teaching and learning. The findings are provided below;

"*Yes, AI has the potential to enhance interactive teaching and learning. With the continuous modification and conceptualisation of AI tools, it will in the future provide a fascinating platform for educators and learners to engage. The tools are being upgraded daily with the tools becoming more users friendly and becoming easy to use. With the situation of things, some AI tools will be developed for educational purpose only and this will make its use more general and the adoption will be popular among the students and the staff".*

Discussion of Findings

Research question one revealed that Google Classroom ranked first with a percentage score of 53.12 was the most utilised AI tool among lecturers while Microsoft Team with a percentage score 12.79 was the least adopted tool among lecturers in Nigerian universities. This implies that lecturers in universities often make use of google classroom for instructional purposes. This was followed by the use of ChatGPT with a percentage score of 19.02 and closely followed by Zoom with a percentage score of 15.08. The analysis indicated that Microsoft Team is the least adopted tools. This is closely related with the findings from the qualitative approach which indicated that participants often used ChatGPT coupled with other tools like Meta-Installed AI and Learning Management System.

Table 3 showed the challenges faced by Nigerian universities lecturers in the use of AI for their teaching practice. Based on the result of this study, it was revealed that internet accessibility with a percentage score of 59.67 was the predominant challenges faced by lecturers in Nigerian universities. This is followed by Lack of ICT gadgets among students with a percentage score of 19.02 and closely followed by Limited Infrastructure with a percentage score of 15.08. Resistance to change with a percentage score of 6.23 was the least challenge among lecturers in Nigerian universities. The result implies that lecturers are constrained in the use of AI not because they are not ready to adopt it but due to inaccessibility to internet. The findings agree with the qualitative result which showed that difficulty in the installation of AI tools due to inaccessibility of authentic tools and some due to high cost of subscription fee, internet accessibility and connectivity were some challenges faced by lecturers in the use of AI.

The result of this study agrees with the findings of the study carried out by Lawoye, Ahmed, Yusuf and Abdulraheem (2024) which revealed that the challenges in the adoption of AI in universities include identified include inadequate infrastructure, limited internet connectivity, insufficient funding, lack of skilled personnel, and concerns over data privacy and security. The result is also in line with outcome of the study carried out by Kayode and Odumabo (2024) which revealed that the key barriers to the implementation of artificial intelligence technology are strategy, organizational maturity, data governance, and infrastructure of necessary IT in the campuses. The outcome of this study also agrees with the result of the study carried out by Al Onyanabo (2024) which revealed the challenges for adopting AI to include inadequate infrastructure, limited funding, poor internet connectivity, and resistance to technological change among educators and policymakers.

Conclusion

Based on the findings of the study, it was concluded that Google Classroom is popular and was the most adopted AI tools among lecturers in universities and internet accessibility remains the greatest challenge faced by lecturers in the adoption and use of AI tools in universities in Nigeria. Conclusively, AI has the future potential of positively changing the face of teaching and learning as it has the potential of providing a fascinating platform for both educators and the learners.

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Recommendations

Based on the findings and the conclusion of the study, the following recommendations were made:

1. Lecturers should sustain their effort in the use of Google Classroom and explore other options of AI tool like ChatGPT, Learning Management System, Google Meet as well as Zoom.
2. Universities should make concerted efforts to provide internet accessibility to lecturers as well as students to promote the adoption of AI among lecturers as well as students in the University.
3. Efforts should be made by lecturers to contribute positively in form of opinion on what to be included to make AI platform more interactive for future teaching and learning purpose.

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