Assessment of College of Education Students on the Utilization of Artificial Intelligence Software for Learning in South-West, Nigeria

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Abstract
In recent times, considerable progress have been made in different countries of the world to make use of Artificial Intelligence (AI) for supporting students learning and as such, should not be left to chance in Nigeria school generally. This study investigated the assessment of College of Education (COE) students on the utilisation of AI software for learning in South-west, Nigeria. The study was a descriptive research, using the survey method. The population of the study was all students of COE in South-west, Nigeria. Four Federal COE were purposively selected for the study; random sampling technique was used to select 326 students that form the sample of the study. The instrument for the study was questionnaire. Seven experts validated the instrument. The reliability of the constructs was examined using the Crombach Alpha and it yielded 0.78 for utilisation and 0.71 for ease of use respectively. Data collected were analysed using mean and standard deviation for research questions one, two, three and four while t-test was used to test hypotheses one and two which were derived from research questions three and four. The result revealed among other that, students in COE utilised AI for learning. But there was significant difference between male and female COE on the utilisation of AI for learning. It was recommended among others that COE students should be trained to improve in the utilisation of AI for learning.

Keywords: Artificial Intelligence, learning, South-west Zone, utilisation

Introduction

Artificial intelligence (AI) has been in public conversation for many years. It is frequently portrayed in science, fiction, movies or arguments about how clever computers would take over the world and reduce humans to menial labourers in order to uphold the new artificial intelligence order. Although, this image presents artificial intelligence in a somewhat caricatured manner, the truth is that artificial intelligence has already arrived

in the current day, and many of us use technology on a daily basis. Artificial intelligence technology is no longer the domain of futurologists; rather, it is becoming a crucial part of many organisations' business models and a major strategic component of plans for several businesses, governments and medical fields worldwide. Due to artificial intelligence's transformative power, there has been a notable surge in scholarly interest; recent studies have focused on the technology's effects and repercussions rather than its performance implications, which appear to have dominated the field for a while. Software programmes that employ machine learning to carry out particular tasks are known as artificial intelligence tools (Yogesh et al, 2021).

Singh (2024) opined that AI tools are made to be able to adjust to data, learn from it, and mimic human decision-making. Based on this submission, one may not realise how much experience one has with artificial intelligence tools until oneconsiders Zoom, Google Photos, Netflix suggestions, Google Assistant, Siri, and Amazon Alexa, among several other tools. The use of artificial intelligence in education is expanding quickly, and the global market for it is expected to reach several billion dollars. Its capacity to revolutionise numerous facets of teaching and learning process accounts for its explosive expansion. Artificial intelligence is capable of much more work, including the creation of "smart content," immersive virtual learning environments, easing language barriers, bridging the gap between teaching and learning and personalised learning programmes for every student.

Artificial intelligence has the potential to completely transform the education industry by improving student learning and instructor effectiveness. With its ability to reduce administrative workloads, provide immersive learning environments and provide individualised lesson plans, AI solutions are quickly becoming essential in classrooms, as such, (Mcfarland, 2024) opined thatthe quick development of AI in education is evidence of its promise to improve efficiency, engagement and customisation of teaching and learning procedure. It is seen that AI in education has been in existence for about 40 years and has operated under various other names, the most common of which is intelligent tutoring systems which has continued to use techniques from AI and cognitive science to attempt to understand the nature of learning and teaching and to build systems to assist learners to master new skills or understand new concepts in ways that mimic the actions of a skilled human tutor working one-on-one with the learner. This assumption was also subscribed to by Boulay (2016) who affirmed that such systems attempt to adapt the way they teach the learners, impart knowledge, skills and preferred ways of learning, and to consider the learners' affective trajectory as they deal with the expected setbacks and impasses of mastering new material. There are clearly some overlaps with other uses of computing technology in education, although the commitment to individual adaptation through modelling different parts of the educational process is key.

Dogan et al. (2023) explained that AI in online learning in Colleges of Education had a noticeable increase after 2007, and most of the papers published in the databases show that research on AI in higher education lacks educational and psychological theories. This implies that the vast majority of the papers published about artificial intelligence and higher education or online education are from the Computer Science or Engineering field, focusing on technological implementations of AI in higher education.

Algorithmic online learning environments are those that apply AI and machine learning approaches to the design and implementation of the learning environment. For learners, the ease of use of artificial intelligence to create a successful path has advantages. With personalised features, Kavitha and Lohani (2019) and Lee, et al. (2021) surmised that AI can give students a better learning experience and improve their learning outcomes. Massive online open courses and other online learning environments that use AI-driven learning experiences use machine learning algorithms to track learner behaviours in order to improve learners' performance. The relationship between learning behaviour and efficacy can be clarified by processing vast volumes of learning data with machine learning algorithms. This can also provide effective pathways for recommender systems that help learners make decisions in online learning.

West, et al. (2019) focused on the intersection of gender discrimination and digital assistance and offered suggestions for closing the gender gap in digital skills, including coding for various artificial intelligence applications. Kausar, et al, (2023) asserted that there has to be a global conversation on the relationship between artificial intelligence and gender prejudice because artificial intelligence approaches heavily favour gender impartiality, which can result in positive social developments. One example of this would be AI-powered recruitment software, which can be used to remove gender biases against women while also helping firms write more inclusive job listings by including gender-sensitive phrasing.

While it is widely believed that as digital technologies become more accessible, it will help to narrow the pervasive gender gap (Bryant,2022), as such, the fact remains that there are differences in how men and women use digital services, including AI tools. Gendered effort and performance expectations are significant elements influencing this discrepancy among other causes (Eccles, 2015) and (Ofosu-Ampong, 2023).Additionally, these expectations change far more slowly than technological advancements. Men are therefore more likely to employ artificial intelligence technologies than women, even though women may be downloading and visiting them.

Statement of the Problem

In recent years, the use of artificial intelligence in education has increased worldwide. The launch of the ChatGPT-3 posed great challenges for higher education, given its popularity among university students. Uket-Eteng and Effiom (2024) worked on

analysis of higher education students' attitude towards artificial Intelligence-based educational intervention for learning. The result showed that 98% representing majority of the students had a positive attitude towards AI-based educational intervention for learning and research. However, researchers focus on analysis of higher education student's attitude towards artificial Intelligence-based educational intervention for learning, but not focusing on assessment of College of Education students on the utilisation of artificial intelligence software for learning.

Traditional teaching methods come with limitations in today's evolving world. This engagement by students is limited; traditional methods can lead to passive learning. So students become recipients of information, and are not active participants in the learning process; lack real-world connection; and more often than not, traditional methods often fail to connect learning to real-world applications. It makes it difficult for students to see the relevance of what they are learning, lacks personalisation and traditional methods may not cater for individual learning styles and paces. Students come with diverse learning preferences and abilities, and they may find it challenging to thrive in a one-size-fits-all approach. Billabong (2024) reported that the use of technology is limited; traditional teaching methods may not fully leverage the benefits of modern technology. It is an era where technology plays a significant role in various aspects of life. The limited integration of technology tools in traditional methods can be a disadvantage. Hence, the rationale behind carrying out a study on assessment of Colleges of Education students on the utilisation of artificial intelligence software for learning in South-west, Nigeria.

Purpose of the Study

This study investigated the assessment of College of Education students on the utilisation of artificial intelligence software for learning in South-west, Nigeria. Specifically, the study examined:

- The College of Education students' on the utilisation of artificial intelligence for learning.
- The College of Education students' on the ease of use of artificial intelligence for learning.
- The influence of gender on College of Education students on the of artificial intelligence for learning.
- The influence of gender on College of Education students on the ease of use of artificial intelligence for learning

Research Questions

The study sought and provided answers to the following research questions:

- What are the College of Education students' on the utilisation of artificial intelligence for learning?
- What are the College of Education students' on the ease of use of artificial intelligence for learning?
- What influence do College of Education students' have on the utilisation of artificial intelligence for learning based on gender?
- What influence do College of Education students' have on the ease of use of artificial intelligence for learning based on gender?

Research Hypotheses

The following research hypotheses were formulated and tested at 0.05 level of significance:

Ho_1: There is no significant difference in College of Education students on the utilisation of artificial intelligence for learning based on gender.

Ho_2: There is no significant difference in College of Education students on ease of use of artificial intelligence for learning based on gender.

Methodology

The descriptive survey research design was employed in carrying out the study. The population for the study was all College of Education students that were located in the South-west geo-political zone in Nigeria. In order to ensure a fair representation, multi-stage sampling technique was used for selection of sample for the study. In first stage, four Federal Colleges of Education were purposively selected for the study. In the second phase, the stratified random sampling technique was used to select 326 200level Science students that form the sample size of 15% of 2,174 of the target population for the study. The instrument for data collection was researcher-constructed questionnaire title: assessment of College of Education students on the utilisation of artificial intelligence software for learning. The instrument was made up of three sections (A, B and C). Section A sought responses on bio-data (gender),section B contained 10 statements that sought the College of Education students' opinion on the utilisation of artificial intelligence software for learning. Section composed of 10 statements that sought the College of Education students' opinion on the ease of use of artificial intelligence for learning. The responses for all the items in sections B and C were framed on four point Likert scales of Strongly Agree (SA=4), Agree (A=3), Disagree (D=2) and Strongly Disagree (SD=1).

The face and content validity of the instrument was established by 12 experts from the Department of Educational Technology, University of Ilorin, Nigeria. Thereafter, the corrections and suggestions of the experts were incorporated in the final draft of the

instrument. The validated instrument was used for reliability data. The reliability of the instrument was established using Crombach Alpha. The instrument was administered to 30 Colleges of Education 200level Science students in Kwara State Colleges of Education, Ilorin, North-central, Nigeria, who were outside the area of the study. The response of the students was scored and subjected to Crombach Alpha version 23. On the analysis of the data, a reliability coefficient of 0.78 for utilisation of artificial intelligence software was obtained

The researchers and two research assistants personally administered the questionnaire in four Federal Colleges of Education in South-west, Nigeria. The researchers sought permission from Heads of Departments of the sampled institutions to distribute copies of the questionnaire to the selected 200level Science students. Subsequently, copies of the questionnaire were disseminated among the participants in order to elicit their responses to the presented items. The students were encouraged to fill the questionnaire on the spot. Thereafter, the researchers and the assistants collected the questionnaire immediately after response. Subsequently, the participants' responses were gathered and examined using mean and standard deviation for research questions one, two, three and four. The criterion mean was established at 2.50 due to the utilisation of a four-point Likert scale to frame the items in the questionnaire$\left(\frac{4+3+2+1}{4} = 2.50\right)$. Thet-test was used to test hypotheses one and two which were derived from research questions three and four. The hypothesis was tested at 0.05 significant level.

Results

Research Question one: What are the colleges of education students' on the utilisation of artificial intelligence for learning?

Table 1: The Mean and Standard Deviation on the Colleges of Education Students' on the Utilisation of Artificial Intelligence for Learning.

S/N	Statements	Mean	Std. Deviation	Remark
1	Artificial intelligence would give me the opportunity to learn anytime anywhere	3.35	1.011	Agree
2.	Artificial intelligence can be used to download additional reading materials to that of lecturers' note	3.25	1.046	Agree
3.	The use of artificial intelligence is better than use of paper (hardcopy).	2.38	1.048	Agree
4.	Classroom noise and distraction can be avoided with use of artificial intelligence	3.49	0.803	Agree

5.	Artificial intelligence are better use for entertainment than for studying	1.51	0.803	Disagree
6.	The use of artificial intelligence makes my study very interesting	2.99	1.032	Agree
7.	The use of artificial intelligence make learning comfortable	3.56	0.604	Agree
8.	Artificial intelligence provide more information than lecturers	2.98	1.018	Agree
9.	The use of artificial intelligence for reading make the coverage of course work faster than handouts	2.81	1.039	Agree
10.	The use of artificial intelligence for study improve my academic performance and understanding	3.53	0.751	Agree

Criterion mean: 2.50

Table 1 indicates that items 5 with mean values of 1.51 are below the criterion mean of 2.50. Other items 1, 2, 3, 4, 6, 7, 8, 9 and 10 with mean values of 3.35, 3.25, 2.38, 3.49, 2.99, 3.56, 2.98, 2.81 and 3.53 are above the criterion mean. The data showed that items 1, 2, 3, 4, 6, 7, 8, 9 and 10 are artificial intelligence that were utilised by colleges of education students for learning while items 5 was not used by colleges of education students for learning. This shows that colleges of education students utilised the artificial intelligence for learning.

Research Question 2: What are the colleges of education students' on the ease of use of artificial intelligence for learning?

Table 2: The Mean and Standard Deviation on Colleges of Education Students' on the Ease of Use of Artificial Intelligence for Learning

S/N	Statements	Mean	Std. Deviation	Remark
1	The use of artificial intelligence for learning requires less efforts	3.13	0.892	Agree
2.	The small screen size of mobile technologies make it not easy to use artificial intelligence for learning	2.97	0.897	Agree
3.	It is easy to use artificial intelligence anytime and anywhere	1.61	0.890	Disagree
4.	The use of artificial intelligence for learning does not require any stress	2.35	0.964	Agree

5.	The use of artificial intelligence for learning requires the assistance of expert and special skill	1.46	0.763	Disagree
6.	Unstable power supply make it easy to use artificial intelligence for learning.	1.88	0.747	Disagree
7.	The use of artificial intelligence for learning consumes more time than lecture from lecturers	2.02	0.740	Disagree
8.	With instability of power supply it is not difficult to learn with artificial intelligence	1.57	0.830	Disagree
9.	It is easy to do assignment using artificial intelligence than using paper and pen	3.07	0.765	Agree
10.	It is easy to get relevant information for study with the use of artificial intelligence	1.35	0.888	Disagree

Criterion Mean: 2.50

Table 2 indicates that items 3, 5, 6, 7, 8 and 10 with mean values of 1.61, 1.46, 1.88, 2.02, 1.57 and 1.35 are below the criterion mean of 2.50. Other items 1, 2, 4 and 9 with mean values of 3.13, 2.97, 3.35 and 3.07 are above the criterion mean. The data showed that items 1, 2, 4 and 9 are artificial intelligence that colleges of education students found easy to use for Learning while items 3, 5, 6, 7, 8 and 10 are artificial intelligence that college of education students were not found easy to use for learning . This presents that colleges of education student did found artificial intelligence easy to use for learning.

Research Question Three: What influence does colleges of education students' gender have on the utilisation of artificial intelligence for learning?

Table 3: The Mean and Standard Deviation on the colleges of education students' gender have on the utilisation of artificial intelligence for learning

Gender	N	Mean	Std. Deviation
Male	101	27.08	2.64
Female	225	27.59	2.44

Table 3 shows that the male college of education students had the mean score of 27.08 with standard deviation value of 2.64 while the female college of education students had the mean score of 27.59 with standard deviation value of 2.44. This result reveals a difference in the value of mean scores. Therefore, it can be said that there is a difference

between male and female college of education on the utilisation of artificial intelligence for learning.

Research Question Four: What influence does colleges of education students' gender have on the ease of use of artificial intelligence for learning?

Table 4: the influence of gender on colleges of education students on the ease of use of artificial intelligence for learning

Gender	N	Mean	Std. Deviation
Male	101	21.88	2.55
Female	225	22.66	2.71

Table 4 shows that the male college of education students had the mean score of 21.88 with standard deviation value of 2.55 while the female college of education students had the mean score of 22.66 with standard deviation value of 2.71. This result reveals a difference in the value of mean scores. Therefore, it can be said that there is a difference between male and female college of education on the ease of use of artificial intelligence for learning.

Hypotheses testing

Hypothesis one: There is no significant difference in colleges of education students on the utilisation of artificial intelligence for learning based on gender.

Table 5: t-test of male and female colleges of education students on the utilisation of artificial intelligence for learning

Gender	N	Mean	Std.D	Df	T	Sig	Remark
Male	101	27.0792	2.63698	324	1.695	.091	NS
Female	225	27.5867	2.43538				

Table 5 shows that there was no significant difference between the male and female colleges of education students on the utilisation of artificial intelligence for learning (df = 324; t= 1.695; p>.091). Based on this result, hypothesis 1 is not rejected.

Hypothesis Two: There is no significant difference in colleges of education students on ease of use of artificial intelligence for learning based on gender.

Table 6: t-test of male and female colleges of education students on ease of use of artificial intelligence for learning

Gender	N	Mean	Std.D	Df	T	Sig	Remark
Male	101	21.8812	2.55064	324	2.433	.016	S
Female	225	22.6578	2.71458				

Table 6 shows that there was significant difference between the male and female colleges of education students on the ease of use of artificial intelligence for learning (df = 324; t= 2.433; p>.016). Based on this result, hypothesis 2 is hereby rejected.

Discussion of Findings

The research findings of this study are discussed in relating to the research questions and research hypotheses. The result of the findings revealed that College of Education students utilised the artificial intelligence for learning. The finding of this study agreed with that of Boulay (2016) who affirmed that artificial intelligence in education has been in existence for about 40 years and has operated under various other names, the most common of which is intelligent tutoring systems. It continues to use techniques from artificial intelligence and cognitive science to attempt to understand the nature of learning and teaching and to build systems to assist learners to master new skills or understand new concepts in ways that mimic the actions of a skilled human tutor working one-on-one with the learner. That is, such systems attempt to adapt the way they teach to the learners' knowledge, skills and preferred ways of learning, and to consider the learners' affective trajectory as they deal with the expected setbacks and impasses of mastering new material. There are clearly some overlaps with other uses of computing technology in education, although the commitment to individual adaptation through modelling different parts of the educational process is key.

The result of the findings revealed that College of Education students found artificial intelligence easy to use for learning. The finding of this study agreed with that of Dogan et al (2023) who opined that artificial intelligence in online learning in Collegesof Education had a noticeable increase after 2007, and most of the papers published in the databases show that research on artificial intelligence in higher education lacks educational and psychological theories. The vast majority of the papers published about artificial intelligence and higher education or online education are from the Computer Science or Engineering field, focusing on technological implementations of artificial intelligence in higher education.

The result of the findings revealed that there was no significant difference in colleges of education students on the utilisation of artificial intelligence for learning based on gender. The findings of the study is in line with that of Kausar, et al. (2023) who asserted that there has to be a global conversation on the relationship between artificial intelligence and gender prejudice because artificial intelligence approaches heavily favour gender impartiality, which can result in positive social developments. One example of this

would be AI-powered recruitment software, which can be used to remove gender biases against women while also helping firms write more inclusive job listings by including gender-sensitive phrasing. The result of the findings revealed that there was significant difference in College of Education students on ease of use of artificial intelligence for learning based on gender. The findings of the study agreed with that of Eccles(2015) who affirmed that there are differences in how men and women use digital services, including artificial intelligence tools. Gendered effort and performance expectations are significant elements influencing this discrepancy among other causes, additionally, these expectations change far more slowly than technological advancements. Men are therefore more likely to employ artificial intelligence technologies than women, even though women may be downloading and visiting them

Conclusion

Based on the findings of the study, College of Education students utilised the artificial intelligence for learning, Colleges of Education students found artificial intelligence easy to use for learning, there was no significant difference in College of Education students on the utilisation of artificial intelligence for learning based on gender, there was significant difference in College of Education students on ease of use of artificial intelligence for learning based on gender.

Recommendations

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

- College of Education students should be trained to improve in the utilisation of artificial intelligence for learning.
- Educational policy makers should collaborate with ICT experts to develop course wares that will strengthen College of education students' ease of use of artificial intelligence for learning.
- Colleges of Education management should ensure data privacy and security measures are in place to protect students' information and maintain trust in utilisation and ease of use artificial intelligence for learning.
- Laudable training and policies that are devoid of gender discrimination should be formulated and implemented in Colleges of education by stakeholders in order to strengthen female college students to utilise artificial intelligence for learning.

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