# Indonesian Journal of Teaching in Science

**IJOTIS**

# University Students' Awareness of, Access to, and use of Artificial Intelligence for Learning in Kwara State

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## A B S T R A C T S

This study determined university students' awareness of, access to, and use of artificial Intelligence for learning in Kwara State. The study adopted descriptive research of the survey type. This study adopted a descriptive research design of the survey method and employed a three-sectioned questionnaire to elicit information from the respondents. The sample size included a multistage sample of 200 undergraduates across three universities in Kwara state. Descriptive statistics and inferential statistics were employed to answer and test the formulated hypotheses at a 0.05 level of significance. The findings of the study were that majority of the university students are not aware of Artificial intelligence for learning and there was no significant difference between male and female university students' awareness of the use of artificial intelligence for learning. This study concluded that students' ability to explore digital resources such as AI is dependent on their awareness and access to digital technologies. A lack of these will result in a lack of use and lack of skill to use them.

## A R T I C L E   I N F O

## 1. INTRODUCTION

The use of emerging education technology in Nigerian universities is an idea that has become part of this digital society, which characterized science, teaching, and learning in the twenty-first century. Nigeria Computer Society (NCS) claimed that emerging technology is an integral part of information and communication technology (ICT) that is capable of stimulating, inspiring, and engaging students in education (NCS, 2014). According to the communications minister of Nigeria as of 2013, thirty-two million, five hundred and thirteen thousand, two hundred and sixty-one Nigerians access the Internet through telecommunications networks, a larger percentage of which are young people (Osisanwo *et al.,* 2014). Different applications or devices in the ICT environment allow young people to interact more with ICT. Some of these innovations include cloud computing, digital computing, mobile learning, open content, learning analytics, three-dimension (3D) printing, wearable technology, massively open online learning (MOOCs), online learning, remote labs, Edmodo, learning management system (LMS), Google Apps for Education (GAfE), machine learning or Artificial Intelligence learning, and so on.

Access to artificial Intelligence (AI) among students is one of the long-term consequences of increasing the emergence of AI technological devices for educational purposes, is perhaps the evolution of what is termed smart classrooms. This kind of classroom is a departure from the traditional classroom. Smart classrooms are largely technologically enhanced settings that are believed to have the capacity to increase learners' opportunities to actively engage and participate in teaching and learning through the use of technological tools and devices such as Specific software tools, high-speed computers, assertive listing systems, audience response technologies, networking devices and audio-visual capabilities (Ikedinachi *et al.,* 2019). AI systems are finding ever wider applications across companies. Artificial Intelligence is part of our normal lives now. Through automatic parking systems, smart sensors for taking amazing pictures, and personal assistance, we are overwhelmed by this technology. Likewise, in school, artificial intelligence is sensed, and traditional methods are drastically changing (Meyer and Norman, 2020).

One of the main aims and objectives of Massive Open Online Courses (MOOC) providers is to raise awareness of the frontier of knowledge and to make education accessible and inexpensive for all those who want to obtain such knowledge to learn or develop their skills and educational resources base for purposes of achieving better living standards and enhanced job or working conditions and opportunities. Throughout the twentieth century, this singular motive led to the institutionalization of systems and educational platforms that first emerged as laboratory experiments at major Ivy League universities such as Harvard, Stanford, and the Technology Institute of Massachusetts (MIT). The initial purpose of setting up these platforms to disseminate knowledge and education to the world was large to make quality education at all levels, affordable and accessible to all, regardless of the geopolitical locations or time zone of the individual (Chan, 2020). Artificial intelligence is incorporated invisibly by computer applications that can help us improve our understanding and reasoning and communicate with others. Immersive systems have become more ubiquitous, those that use technology to bring us to a separate version of reality (Southgate *et al.,* 2019). Artificial Intelligence is not just a part of computer science, although it is so vast that it requires many other factors that can contribute to it. First, we should know how intelligence is composed to create the AI, so intelligence is an intangible part of our brain that is a combination of

reasoning, learning, perception problem-solving, understanding language, and so on (Mikalef and Gupta, 2021).

Ikedinachi *et al.,* (2019) asserted that application of AI in education, the teacher can be freed from certain routine tasks and can concentrate on establishing links with students, getting to know them, and mastering skills that will accompany them on their journey towards their human development. The development and adoption of new learning and teaching technologies have grown steadily over the past 30 years. Looking through the modern prism, it's easy to forget the controversies raging in our universities about allowing students to use what is now perceived to be outdated technology. In a longitudinal study of facilities for students with disabilities undertaken in the United State between 1993 and 2005, authors remind us of how divisive the controversy surrounded the use of calculators and spell-check systems for students with disabilities in the general student body (Lazarus *et al.,* 2009).

Higher education's future is intrinsically linked to the new smart machines' developments in new technologies and computing capabilities. In this area, advances in artificial intelligence are open to new teaching and learning opportunities and challenges in higher education, with the potential to fundamentally change governance and the internal architecture of higher education institutions. Currently, artificial intelligence is progressing at an accelerated rate, affecting the deep nature of higher education services. The realm of teaching and learning in higher education presents a very different set of challenges as AI solutions have the potential to structurally change university administrative services. Artificial intelligence applications apply to tasks that can be simplified but can not yet be seen as a solution for higher learning tasks that are more complex (Popenici and Kerr, 2017). AI is a technology that affects how people communicate with the Internet and are influenced by it. Likely, its effect will only continue to grow in the near future. AI has the potential to significantly change the way human beings interact, not only with the digital world but also with each other, for better or worse, through their work and other socio-economic institutions.

Technology is getting more commonplace in the recent educational scenario. The use of classroom technology enhances learning and teaching and adds a new dimension to the learning experience as a whole. In the learning sector, emerging technologies such as Artificial Intelligence, Big Data Analytics, Cloud Computing, Augmented, and Virtual Reality are already finding their place. Applying emerging technology trends will lead to a transformation of educational models and re-imagine the way students approach learning altogether. There is an increasing preference for courses combining conventional, face-to-face learning with technological features of online learning environments. Increasing the current education system using smart methods of learning using mobile apps, tablets, and laptops are gradually becoming the norm (Kaliski, *et al.,* 2008). The use of these technological solutions was eventually extended, and we now see them in all personal computers, handheld devices, or wearable devices as common features. Innovations are now what students encounter worldwide, expanding opportunities for teaching and developing educational experiences. Moreover, in cities and campuses around the world, artificial intelligence (AI) is now enhancing tools and instruments that are used day by day. From Internet search engines, smartphone features, and apps, to household appliances and public transport. For example, the complex set of algorithms and software that power the Siri iPhone is a typical example of artificial intelligence solutions that became part of everyday experiences (Bostrom and Yudkowesky, 2014).

Human artificial Intelligence interaction and communication tools to support people with disabilities are already available. Educators are encouraged to apply them to education to

increase teaching and learning for a more engaging method. Complex computing systems using machine learning algorithms can serve people with all kinds of skills and participate in human-like processes and complex computational activities that can be used in teaching and learning to a certain degree. This opens up a new age for higher education institutions. This type of interface between humans and machines offers the immediate potential for changing how we read, memorize, view, and create knowledge (Ikedinach *et al.,* 2019).

Artificial Intelligence (AI) is a computer system that includes human-like processes like learning, adapting, synthesizing, self-correcting, and using data for complex processing tasks. Artificial intelligence is evolving at an accelerated pace, impacting the deep essence of higher education services. It should therefore be pointed out that machine learning is a growing artificial intelligence research area. Many artificial intelligence solutions are highly programmable based, while some of these solutions have an essential ability to predict and learn patterns. Machine learning is software that makes predictions, finds trends, and applies certain patterns that have recently been discovered to situations not covered by their primary architecture (Fahimirad and Kotamjani, 2018). Artificial Intelligence (AI) is a device or instrument that is commonly used throughout the world in various cities or campuses. These include certain technologies such as smartphones, the Internet, search engines, various applications, and household appliances. In addition, they are involved in some human-like processes to some extent and can do some complicated teaching and learning tasks in the world. Therefore, universities are opening up a new age for higher education.

This type of human-machine interaction is a turning point to help people learn and memorize information. There will be some changes in technology applied in education, especially after 2007 when the first iPhone models came on the market, according to Massachusetts Institute of Technology (MIT) scholars. Not only is iPhone a new technology that lets us access and uses the knowledge that was not possible since 2006, but it also triggers a significant cultural shift that influences the social lives of individuals (Liebowitz, 2001). The artificial intelligence sector is an environment dealing with some major innovations like Apple, Google, Microsoft, and Facebook, and are investing heavily in their new applications and research.

Miller, (2019) reported that a new computer model called D-Wave 2X is capable of doing artificial intelligence complex operations (Caplar *et al.,* 2017) This model of computer is faster than the current computers. Like it is a leap forward for Google researchers and a breakthrough in the AI field. "it's hoped it will help researchers create more efficient and accurate models for everything from speech recognition, web search, and protein folding" (Elsayed *et al.,* 2015). Artificial intelligence (AI) can better achieve and manage educational goals. By using AI teachers, students in a class can be evaluated and identified as slow learners to understand the topics. If students have some deficiencies in some areas or fail to understand few subjects, then AI analysis should present this report to lecturers or parents, then appropriate action can be taken by lecturers for scaffolding learning (Bharati, 2017). The AI program helps to explain courses and ensure that all students develop the same conceptual foundation (Elsayed *et al.,* 2015).

Bingimlas, (2009) asserted that the lack of effective access to technical tools also acts as a major barrier to the successful use of technology in education. Most schools and teachers do not have access to technical devices such as smart whiteboards and projectors that can be used in classroom visual representations. Some institutions do not have enough computers and even lack internet access which can be of great use in academic research and remote learning.

The current global economy framework has recognized advanced digital technology development and benefits derived from information and communication technology in a variety of industries, such as banking systems, industry, transportation, communications, and so on, therefore, the education sector must not be left out. To compete favorably with the global trend to modern education technology innovation, there is a strong need to digitize classroom practices in others. The use of technology in Nigerian universities is still very weak, which means that education is lagging as new technologies, especially for learning, are not adequately embraced (Osadebe, 2014).

By introducing AI in education, the teacher can be liberated from certain routine tasks and can focus on building ties with students, getting to know them, leading them to learn skills that will accompany them on their journey towards their human development (Ikedinach *et al.*, 2019). AI, which is built on online platforms, offers learners the ability to get extra help from AI tutors. Above all, AI-driven systems provide the students on the platform with almost immediate helpful feedback. Accordingly, the goal of the researcher is to bridge the gap created by classroom learning by incorporating the power of current technological innovation, especially the use of artificial intelligence among students. This, the researcher noted, is likely to match teaching and learning with digital natives' educational technological innovation. To make a successful transition to knowledge-based education, the introduction of artificial intelligence would be a necessary tool to shift Nigerian education from analog to digital. Hence, this study is focused on students' awareness and access to artificial intelligence for learning in universities in Kwara State Nigeria.

For guiding the conduct of this study, the following research questions are generated:

(i) Are universities students aware of the use of artificial intelligence for learning?
(ii) Do university students have access to Artificial intelligence for learning?
(iii) What is the level of university students' competency in the use of artificial intelligence for learning?

Based on the research questions, the following hypotheses were postulated:

(i) **$H_{01}$:** There is no significant difference between male and female university students' awareness of the use of artificial intelligence for learning.
(ii) **$H_{02}$:** There is no significant difference between male and female university students' access to the use of artificial intelligence for learning.

## 2. METHODS

Descriptive research of the survey type was adopted for this study. This method was considered the most suitable design for this study because it involves selecting a chosen sample from a large population. The population for the study consists of students in three Universities in Kwara state. Kwara State University, Al-Hikmah University, and the University of Ilorin. A multi-stage sampling technique was adopted for this study. Proportional sampling techniques were used to draw the precise number of the participant from each University after which simple random sample technique was used to select 200 respondents out of the total population of 60533 students in the three Universities. The sample size for the study consists of 200 undergraduate students. This study employs a questionnaire to elicit information from the respondents and the categories of variables were independent variables of awareness, access, and competence use of the dependant's variable.

## 2.1. Research Instruments

The instrument used for this research is a structured questionnaire titled "University Student's Awareness of, Access to, and the Use of Artificial Intelligence for Learning in Kwara State". The questionnaire is a close-ended type, which contains a set of pre-determined options to the items presented. The questionnaire contains three sections. Section A, require the demographic information of the respondents. Section B asked the question to assess students' awareness and accessibility of artificial intelligence while section C, asked questions on students' competence in the use of artificial intelligence for learning. Section B was structured using Nominal Scale of Aware, Not Aware and Accessible, Not Accessible question while section C Scale was structured using Likert scale responses modes of Highly Competent (HC), Moderately Competent (MC), Not Skilled (NS). These were presented using three (3) point ratings ranging from Highly Competent (1) to Not Skilled (3) using the mean score benchmark of 2.5 for correspondent's competency.

## 2.2. Validation of the Research Instrument

The instrument was validated by three experts from the Educational Technology Department at the University of Ilorin, Nigeria. The comment and suggestions that were given by the experts led to the modification of the items in the questionnaire. All the items in the questionnaire were judged to be relevant to what is being measured thereby ensuring adequate content and face validity of the instrument. A pilot study was administered from a specific university in the Ekiti State of Nigeria for the reliability of the research instrument. The research instrument was reliable at 0.84 for items on Awareness and Accessibility on the Use of Artificial Intelligence for Learning at 0.05 level of significance, using Cronbach Alpha SPSS statistical tool.

## 2.3. Procedure for Data Collection

The researcher obtained a letter of introduction from the Head of the department, Educational Technology, University of Ilorin, to seek permission from the acceptable authority within the sampled schools to facilitate easy administration of the questionnaires. The researcher read and explained the aim of the study to the participants. The respondents got sufficient time to answer the questionnaire. After which, the researcher personally collected the answered questionnaire and reviewed the qualified and sufficiently completed questionnaire. Insufficient information or a doubtful answer like showing observable patterns was removed for those particular items only. Through the assistance of the statistical analyst, the researchers tabulated the data collected from the participants using Microsoft Excel and eventually process the data collected using SPSS (Statistical Package for Social Sciences). Ethical consideration was maintained through the period of data collection. The researcher ensured that respondents were not coerced to fill the questionnaire and respondents were allowed to participate voluntarily. Also, utmost confidentiality and secrecy of the respondents were maintained during the administration, collation, and report of research findings.

## 2.4. Data Analysis Techniques

Both descriptive and inferential statistics were employed to answer research questions and test the formulated hypotheses at a 0.05 level of significance. The data collected and analyzed in this section represents the variables of focus for the study and background

information of undergraduate students that were actively involved in the study. The demographic information in which data were collected and analyzed is presented in **Table 1**.

Table 1 revealed the demographic information of the participants in this study. As indicated, the gender difference rate of 35.0% was observed, indicating that there was a difference in the proportion of participants in the study: female respondents (67.5%) were more than male respondents (32.5%). Equally, more students from Federal universities 53.0% formed a larger proportion of the sample size, while 34.0% were from state universities and 13.0% were from private universities. This demography implies that there is an almost proportionate representation among the categories of participants.

## 3. RESULTS AND DISCUSSION

### 3.1. Research Question One: Are universities students aware of the use of artificial intelligence for learning?

To investigate the university student's awareness of Artificial intelligence for learning, a data refinement was done and only 60% (120) of the sample size successfully responded to the questionnaire adequately. Then, a percentage point scale of 50.0% was adopted. Data collected were analyzed using frequency counts and percentages. As indicated in Table 2, higher parts of the responses were skewed towards the "not aware" response, implying that the majority of the university students are not aware of Artificial intelligence. However, Google Assistance, Alexa, and Oliva seem to be seemingly known among university students. Perhaps, in general, the cumulative total percentage point scale of 80.3% which is greater than the benchmark of 50.0% indicated that the majority of the university students are not aware of Artificial intelligence for learning.

### 3.2. Research Question Two: Do university students have access to Artificial intelligence for learning?

In investigating university student's access to Artificial intelligence for learning, a percentage point scale of 50.0% was adopted. Data collected were analyzed using frequency counts and percentages. As indicated in **Table 3**, higher parts of the responses were skewed towards the "not accessible" response, implying that the majority of the university students do not have access to Artificial intelligence. Perhaps, in general, the cumulative total percentage point scale of 80.7% which is greater than the benchmark of 50.0% indicated that the majority of the university students do not have access to Artificial intelligence for learning.

### 3.3. Research Question Three: What is the level of university students' competency in the use of artificial intelligence for learning?

In assessing the competency of university students on the use of Artificial intelligence for learning, a percentage point scale of 33.3% was adopted. Data collected were analyzed using frequency counts and percentages. As indicated in **Table 4**, higher parts of the responses were skewed towards the "not skilled" response. However, few of the participants still indicated that they were moderately competent in using Artificial intelligence. These include: using Alexa to convert speech to text; using Google Assistant to send mail, share calendar schedule and learning independently; using Siri to create a to-do list, play audiobook, and send mail; using Socratic to solve homework; using Cortana to source for information online on the PC; interacting with Replica on day-to-day activities; using ELSA Speak to improve on speaking skills; using Hound to send messages and provide news or accurate weather, and using Lisa to select the best media to illustrate learning. Cumulatively, the summary total percentage

point scale of 44.8% which is the greatest among the percentage values and greater than the benchmark of 33.3% indicated that the majority of the university students are not skilled and incompetent in the use of artificial intelligence for learning.

### 3.4. Hypotheses Testing
### 3.4.1. Hypothesis One: There is no significant difference between male and female university students' awareness of the use of artificial intelligence for learning

From **Table 5**, there was no significant difference between male and female university students' awareness of the use of artificial intelligence for learning. This is reflected in the findings of the hypothesis tested df (118), t= -.847, p>0.05=0.399). Thus, the hypothesis which states that "there is no significant difference between male and female university students' awareness in the use of artificial intelligence for learning" is accepted.

**Table 1.** Demographic information of the respondents.

| Demographic Data | | Frequency | Percentage |
|---|---|---|---|
| **Gender** | Male | 65 | 32.5 |
| | Female | 135 | 67.5 |
| | **Total** | **200** | **100.0** |
| **Institution Type** | Federal University | 106 | 53.0 |
| | State University | 68 | 34.0 |
| | Private University | 26 | 13.0 |
| | **Total** | **200** | **100.0** |

**Table 2.** Awareness of the use of artificial intelligence for learning.

| S/N | Items | Aware Freq. (%) | Not Aware Freq. (%) |
|---|---|---|---|
| 1 | Alexa | 31 (25.8) | 89 (74.2) |
| 2 | Google Assistance | 32 (26.7) | 88 (73.3) |
| 3 | Siri | 26 (21.7) | 94 (78.3) |
| 4 | Socratic | 21 (17.5) | 99 (82.5) |
| 5 | Cortana | 21 (17.5) | 99 (82.5) |
| 6 | Replica | 26 (21.7) | 94 (78.3) |
| 7 | Elsa Speak | 27 (22.5) | 93 (79.2) |
| 8 | Hound | 25 (20.8) | 95 (79.2) |
| 9 | Wysa | 24 (20.0) | 96 (80.0) |
| 10 | FaceApp | 22 (18.3) | 98 (81.7) |
| 11 | Parla | 19 (15.8) | 101 (84.2) |
| 12 | Duolingo Bots | 15 (12.5) | 105 (87.5) |
| 13 | Lisa | 16 (13.3) | 104 (86.7) |
| 14 | Tetra | 23 (19.2) | 97 (80.8) |
| 15 | Oliva | 31 (25.8) | 89 (74.2) |
| 16 | Astro | 26 (21.7) | 94 (78.3) |
| 17 | Trove | 23 (19.2) | 97 (80.8) |
| 18 | Capsule AI | 21 (17.5) | 99 (82.5) |
| 19 | Brain.fm | 22 (18.3) | 98 (81.7) |
| 20 | Ada Healthcare App | 22 (18.3) | 98 (81.7) |
| **Cumulative Total** | | **473 (19.7)** | **1927 (80.3)** |

**Table 3.** Students' access to the listed artificial intelligence items for learning.

| S/N | Items | Accessible Freq. (%) | Not Accessible Freq. (%) |
|-----|-------|---------------------|--------------------------|
| 1 | Alexa | 19 (15.8) | 101 (84.2) |
| 2 | Google Assistance | 24 (20.0) | 96 (80.0) |
| 3 | Siri | 28 (23.3) | 92 (76.7) |
| 4 | Socratic | 27 (22.5) | 93 (77.5) |
| 5 | Cortana | 18 (15.0) | 102 (85.0) |
| 6 | Replica | 17 (14.2) | 103 (85.8) |
| 7 | Elsa Speak | 21 (17.5) | 99 (82.5) |
| 8 | Hound | 23 (19.2) | 97 (80.8) |
| 9 | Wysa | 20 (16.7) | 100 (83.3) |
| 10 | FaceApp | 20 (16.7) | 100 (83.3) |
| 11 | Parla | 19 (15.8) | 101 (84.2) |
| 12 | Duolingo Bots | 27 (22.5) | 93 (77.5) |
| 13 | Lisa | 26 (21.7) | 94 (78.3) |
| 14 | Tetra | 31 (25.8) | 89 (74.2) |
| 15 | Oliva | 19 (15.8) | 101 (84.2) |
| 16 | Astro | 18 (15.0) | 102 (85.0) |
| 17 | Trove | 19 (15.8) | 101 (84.2) |
| 18 | Capsule AI | 33 (27.5) | 87 (72.5) |
| 19 | Brain.fm | 25 (20.8) | 95 (79.2) |
| 20 | Ada Healthcare App | 28 (23.3) | 92 (76.7) |
| **Cumulative Total** | | **462 (19.3)** | **1938 (80.7)** |

### 3.4.2. Hypothesis Two: There is no significant difference between male and female university students' access to the use of artificial intelligence for learning

From **Table 6**, there was no significant difference between male and female university students' access to the use of artificial intelligence for learning. This is reflected in the findings of the hypothesis tested df (118), t= .518, p>0.05=0.606). Thus, the hypothesis which states that "there is no significant difference between male and female university students' access to the use of artificial intelligence for learning" is accepted.

### 3.5. Discussion of Findings

This study is premised on bridging the gap created by classroom learning by incorporating the power of current technological innovations such as artificial intelligence. It was conceptualized that to make a successful transition to knowledge-based education, the introduction of artificial intelligence would be a necessary tool to shift Nigerian education from analog to digital. Hence, this study focused on university students' awareness, access, and use of artificial intelligence for learning in universities in Kwara State Nigeria. Three research questions were raised and answered while two hypotheses were formulated based on the research questions and tested at a 0.05 level of significance.

**Table 4.** Level of university students' competency in the use of artificial undergraduate for learning.

| S/N | Items | Highly Competent Freq. (%) | Moderately Competent Freq. (%) | Not Skilled Freq. (%) |
|---|---|---|---|---|
| 1 | I can use Alexa to create to-do list | 8 (6.7) | 42 (35.0) | 70 (58.3) |
| 2 | I can use Alexa to play audiobook | 10 (8.3) | 36 (30.0) | 74 (61.7) |
| 3 | I can use Alexa to convert speech to text | 16 (13.3) | 72 (60.0) | 32 (26.7) |
| 4 | I can use google assistance to send mail | 27 (22.5) | 66 (55.0) | 27 (22.5) |
| 5 | I can share calendar schedule using google assistance | 11 (9.2) | 52 (43.3) | 57 (47.5) 260 |
| 6 | I can share calendar schedule using Alexa | 8 (6.7) | 42 (35.0) | 70 (58.3) |
| 7 | I can use google assistance to interact with my course mate | 10 (8.3) | 36 (30.0) | 74 (61.7) |
| 8 | I can use google assistance to learn on my own | 16 (13.3) | 72 (60.0) | 32 (26.7) |
| 9 | I can use Siri to create to-do list | 27 (22.5) | 66 (55.0) | 27 (22.5) |
| 10 | I can use Siri to play audiobook | 11 (9.2) | 52 (43.3) | 57 (47.5) |
| 11 | I can use Siri to send mail | 32 (26.7) | 58 (48.3) | 30 (25.0) |
| 12 | I can use Siri to share calendar schedule | 8 (6.7) | 42 (35.0) | 70 (58.3) |
| 13 | I can use Siri to interact with my course mate | 10 (8.3) | 36 (30.0) | 74 (61.7) |
| 14 | I can use Socratic to solve my home work | 16 (13.3) | 72 (60.0) | 32 (26.7) |
| 15 | I can use Socratic to solve mathematical problem | 8 (6.7) | 42 (35.0) | 70 (58.3) |
| 16 | I can use Socratic to search historical content | 10 (8.3) | 36 (30.0) | 74 (61.7) |
| 17 | I can use Cortana to source for information online on my PC | 16 (13.3) | 72 (60.0) | 32 (26.7) |
| 18 | I can interact with Replica on my day-to-day activities | 27 (22.5) | 66 (55.0) | 27 (22.5) |
| 19 | I **can use** ELSA Speak to improve on my speaking skills | 11 (9.2) | 52 (43.3) | 57 (47.5) |
| 20 | I can use Hound to send messages and provide news or accurate weather | 32 (26.7) | 58 (48.3) | 30 (25.0) |
| 21 | I can use Parla to improve on my vocabulary | 8 (6.7) | 42 (35.0) | 70 (58.3) |
| 22 | I can use Duolingo Bots to practice reading and writing | 10 (8.3) | 36 (30.0) | 74 (61.7) |
| 23 | I can use Lisa to select best media to illustrate my learning | 16 (13.3) | 72 (60.0) | 32 (26.7) |
| 24 | I can use Tetra for recording and listen to class discussion | 27 (22.5) | 66 (55.0) | 27 (22.5) |
| 25 | I can use Astro to interact with my email inbox efficiently | 11 (9.2) | 52 (43.3) | 57 (47.5) |
| **Cumulative Total** | | **386 (13.5)** | **1188 (41.7)** | **1276 (44.8)** |

This study found that the majority of university students are not aware of and do not have access to the use of AI for learning. This finding could be premised on the fact that AI is relatively new to the Nigerian learning community. The application of AI in education is largely credited to the developed countries where most of the students are aware and their resources to access them (Lazarus *et al.,* 2009). Studies have emphasized that the development and adoption of new learning and teaching technologies have grown steadily over the past 30 years, but the adoption in developing countries is relatively low. This finding equally supports the findings of (Ikedinachi, et al., 2019) who stated that knowledge about and access to AI among students is one of the long-term consequences of increasing the emergence of AI technological devices for educational purposes. The researchers stressed that perhaps AI is the evolution of what is termed smart classrooms, that is, a departure from the traditional classroom. However, it is largely technologically dependent, with greater emphasis on large integration of resources which could be relatively unavailable to the students.

The finding of this study shows that majority of the university students are not skilled and incompetent in the use of AI for learning. This finding corroborates the earlier finding of lack of awareness and access. It is believed that competency in technological innovation is dependent on the knowledge of, availability, and access to the technological innovations. This finding supports the finding of Popenici and Kerr, (2017) who relayed that the realm of learning in higher education presents a very different set of challenges for students, especially as the ability to explore AI solutions will potentially restructure the learning process for students. The researchers emphasized that the capability to explore AI skillfully and gain substantive knowledge through its use is wide and requires lots of technical skills which might be unavailable to many students at this time.

This study found that gender does not influence university students' awareness of, access to, and competency in the use of AI for learning. Researchers over the years have reported differing findings as regards gender differences in technology adoption, integration, and use. These differing findings indicated that gender difference issues remain inconclusive. In the light of this, this study found out that as a majority of students are not aware of, lack access to, and do not have the skills to explore or use AI, their gender is not influential to their position.

This finding negates the position of Zawacki-Richter *et al.,* (2019) who reported that students' gender has a significant impact on all educational actors in general and in particular on artificial learning intelligence. The researcher stressed that innovation, incorporation, and implementation of emerging technologies are highly gender sensitive. In fact, the researcher reported that women and girls are poorly positioned to benefit from the use of AI because they have less access to specific scientific and technical education and education in general.

**Table 5.** Independent sample t-test analysis of gender difference in the students' awareness of the use of artificial intelligence for learning.

| Gender | N | X | SD | df | *T* | Sig. (2-tailed) | Remark |
|--------|----|------|------|-----|-------|-----------------|----------|
| Male   | 37 | 1.79 | .089 |     |       |                 |          |
|        |    |      |      | 118 | -.847 | .399            | Accepted |
| Female | 83 | 1.81 | .098 |     |       |                 |          |

**Table 6.** Independent sample t-test analysis of gender difference in the students' access to the use of artificial intelligence for learning.

| Gender | N | X | SD | df | *T* | Sig. (2-tailed) | Remark |
|---|---|---|---|---|---|---|---|
| Male | 37 | 1.82 | .088 | | | | |
| | | | | 118 | .518 | .606 | Accepted |
| Female | 83 | 1.80 | .083 | | | | |

## 4. CONCLUSION

In an effort to adopt ICT into Nigeria's educational system, the Nigeria Government suggested that a regional fiber optic backbone network should be built to ensure high bandwidth availability, universal funding, and programs for access to emerging digital technologies such as AI. Sadly, the efforts have shown no positive outcome. Despite the laudable evidence shown in developed countries as regards AI integration in education. AI has shown capabilities to provide unique knowledge and skills that are required to live the fourth evolution era by providing ways to dynamically explore and represent information. This study has provided evidence that students' ability to explore digital resources such as AI is dependent on their awareness and access to digital technologies. A lack of these will result in a lack of use and lack of skill to use them.

## 5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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