Awareness and preparedness of Osun State University students towards adopting artificial intelligence for teaching science subjects

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ABSTRACT
The study investigated awareness and preparedness of Osun State University students towards adopting artificial intelligence (AI) for learning science subjects. The study is a descriptive and inferential statistical study; a sample of 150 students from Osun State University formed the participants for the study. Data collected was analyzed using descriptive statistics, such as frequencies, percentages, means, and standard deviations. The finding revealed that the level of awareness among Osun State University students of AI and its applications in science education is high. The perceptions and attitudes of Osun State University students towards the use of AI in science teaching is high. The level of preparedness of Osun State University students to engage with AI as a tool and resource in learning science subjects. The following recommendations were made; Osun State University should make efforts to integrate AI into science instruction materials. The government and management of tertiary Institutions should create focused interventions to improve AI awareness and readiness. Educational institutions in Nigeria and other developing nations should look to include AI into their science and study curricula. The government should improve the funding and provision of digital equipment to create enabling environment for optimal integration of AI into the learning system.

KEYWORDS
Artificial Intelligence, Science Education, learning motivation, Technology

RÉSUMÉ
L'étude a porté sur la sensibilisation et la préparation des étudiants d'Osun State University à l'adoption de l'intelligence artificielle (IA) pour l'apprentissage des matières scientifiques. La recherche est une étude statistique descriptive et inférentielle ; un échantillon de 150 étudiants d'Osun State University a constitué les participants à l'étude. Les données recueillies ont été analysées à l'aide de statistiques descriptives, telles que les fréquences, les pourcentages, les moyennes et les écarts standards. Les résultats ont révélé que le niveau de sensibilisation des étudiants d'Osun State University à IA et à ses applications dans l'enseignement des sciences est élevé. Les perceptions et les attitudes des étudiants d'Osun State University à l'égard de l'utilisation de l'IA dans l'enseignement des sciences sont élevées. Le niveau de préparation des étudiants d'Osun State University à l'utilisation de l'IA en tant qu'outil et ressource dans l'apprentissage des matières scientifiques. Les recommandations suivantes ont été formulées : l'Osun State University devrait s'efforcer d'intégrer l'IA dans les supports d'enseignement scientifique. Les établissements d'enseignement du Nigeria et d'autres pays en développement

devraient chercher à intégrer l'IA dans leurs programmes de sciences et d'études. Le gouvernement devrait améliorer le financement et la fourniture d'équipements numériques afin de créer un environnement propice à l'intégration optimale de l'IA dans le système d'apprentissage.

MOTS CLÉS
Intelligence artificielle, enseignement des sciences, motivation d'apprentissage, technologie

INTRODUCTION & LITERATURE REVIEW

In recent decades, the growth of Science Education has led to areas of research that are important for learning and teaching the Natural Sciences around the world. Thus, for example, much of the relevant research has been directed towards the identification and classification of misconceptions of students of all ages (Borghini et al., 2022; Kokologiannaki & Ravanis, 2013; Voutsinos, 2013), another part towards the development of effective teaching interventions (Gebru, 2021; Grigorovitch; 2014; Kotuláková, 2013) or in another direction towards teacher training (Draganoudi et al., 2023; Mabejane, 2016; Mudavanhu, 2023). In recent years, digital technologies have been gradually integrated into all these research fields and have become variables that are now studied and measured (Dolianiti, et al., 2021; Martin et al., 2024; Yeşiltaş & Taş, 2021). Of course, as technologies are rapidly developing, educational research is constantly adapting to these technological developments, which is why it has recently begun to monitor the questions and possibilities related to artificial intelligence.

Artificial intelligence (AI) is developing as a potent technology that has the ability to completely change the way we teach and learn, and this is causing a radical change in the education environment. This is especially true in the context of science education, where artificial intelligence-powered solutions may efficiently address the topics' intrinsic complexity and the necessity for active interaction. Osun State University is in a great position to lead this fascinating transformation because of its strong science programs and dedication to cutting-edge pedagogy.

The use of artificial intelligence in science education has become increasingly popular on a global scale in recent years. Research has indicated that the utilization of artificial intelligence-driven resources, such as interactive simulations, adaptive learning systems, and personalized feedback mechanisms, can greatly improve student engagement, retention of knowledge, and critical thinking (OECD, 2020; UNESCO, 2021). By accommodating varied learning styles and rates, these resources provide differentiated instruction—something that traditional approaches frequently find difficult to accomplish. Artificial intelligence can also automate monotonous jobs like record-keeping and grading, giving teachers more time to concentrate on individualized instruction and in-depth conceptual analysis (Huang & Qiao, 2024).

Artificial intelligence has the potential to personalize learning, provide immersive simulations, and automate tasks, ultimately enhancing student engagement and achievement (UNESCO, 2021). However, integrating artificial intelligence into science teaching requires not only technological infrastructure but also acceptance and preparedness from teachers and students (Akinfe, 2020).

The potential of AI in education is becoming more widely acknowledged in Nigeria. The National Policy on Education (2020) emphasizes how integrating technology into education may enhance equity, access, and quality. But there's still a long way to go before artificial intelligence-powered science teaching solutions are widely used, especially in public universities like Osun State University. There are several reasons for this discrepancy, including:

1. Low awareness: The adoption of artificial intelligence in science education is hampered by the fact that many teachers and students are unaware of its potential.
2. Insufficient infrastructure While having access to dependable technology and internet connectivity is essential for making efficient use of artificial intelligence technologies, resource constraints can present difficulties.
3. Absence of teacher training: In order to comprehend and successfully incorporate artificial intelligence tools into their current teaching techniques, teachers must receive proper training and assistance.
4. Ethics and bias concerns: To ensure ethical and responsible adoption, concerns about algorithmic fairness, data privacy, and the possibility that artificial intelligence will worsen already-existing disparities must be addressed.

Focusing on Osun State University, a critical gap exists in understanding students' awareness and preparedness towards adopting artificial intelligence for science teaching. This study aims to bridge the gap by exploring students' perceptions, knowledge, and anxieties related to artificial intelligence integration in their science learning experiences.

Artificial intelligence has become a game-changer in a number of industries, including education, in recent years. By automating administrative activities, improving educational outcomes, and offering tailored learning experiences, AI technologies have the potential to completely transform the teaching and learning process. Given the importance of AI in education, it is critical to investigate students' understanding of and readiness for utilizing AI for learning, especially in scientific courses. Like many other universities, Osun State University stands to gain from incorporating AI technologies into its curriculum in order to raise the standard of instruction. Nonetheless, student preparation and active engagement are necessary for the effective integration of AI in education. Consequently, knowing Osun State University students' awareness and readiness levels for the use of artificial Intelligence will be much relevant.

The purpose of this study is to find out how much knowledge Osun State University students have about AI and its possible uses in the classroom. In addition, the study will evaluate how prepared students are to use AI tools to learn science courses and investigate any obstacles or difficulties that now exist and could prevent the use of AI in the classroom. Through illuminating Osun State University students' understanding of and readiness for utilizing AI in science classes, this research aims to offer significant perspectives for educators, policymakers, and other education-related stakeholders. The results of this study can help build practical approaches to incorporate AI technologies into the curriculum, raise student interest, and improve science learning outcomes. Artificial intelligence plays an important role in:

1. Personalized learning: thanks to AI, tailor's education to each student's needs and preferences. It adapts the pace and style of learning to suit individual students, making science subjects more engaging and comprehensible.
2. Adaptive learning systems: another AI application, adjust the difficulty of learning materials based on students' performance. By providing challenges at the right level, these systems keep students motivated and help them grasp scientific concepts effectively.
3. Intelligent tutoring systems: use AI algorithms to offer personalized support to students. These systems provide instant feedback, identify areas of struggle, and offer targeted guidance, leading to improved understanding and performance in science subjects.

By incorporating AI into education through personalized learning, adaptive systems, and intelligent tutoring, students can benefit from tailored learning experiences, optimized challenges, and individualized support, ultimately enhancing their learning outcomes in science.

Adopting a new technology involves a critical examination of various requirements, ranging from technical issues to human-related issues. Based on this, the research adopted the Unified Theory of Acceptance and Use of Technology (UTAUT) model to investigate the behavioral intention of university students to use AI technologies. The acceptance and use of technologies in organizations, including academic libraries, depends on technical factors like the availability of necessary infrastructure, the relevance of software systems, effective policies and guidelines, and human-related factors such as skills and attitude. Extant literature has indicated that the adoption of AI in library operations is a very valuable asset in the promotion of effective library usage. Sife et al. (2019) noted that the level of ICT implementation in developing countries like Nigeria is very low due to socioeconomic and technological issues. The study used the UTAUT model to examine the factors that influence the use of AI technologies among university students in Nigeria. The theory is based on eight acceptance models, which include the Theory of Reasoned Action (TRA), the Motivation Model, the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), the Model of Personal Computer Utilization, the Social Cognitive Theory, and the Innovation Diffusion Theory (Venkatesh et al., 2019). The goal of the theory is to predict the behavioral intention to use a technology. Owolabi et al. (2019) noted that the theory has four independent variables, which are social influence (SI), performance expectation (PE), effort expectation (EE), and facilitating condition (FC). These constructs are moderated by age, voluntariness of use, gender, and experience.

In recent years, there has been a growing body of research exploring the potential of AI for science learning. Several studies have demonstrated the effectiveness of AI-based interventions in improving student learning outcomes in various science subjects (Akpan & Akinyemi, 2021; Ezeudu & Ogbonna, 2022; Okoye et al., 2023). Similarly, across the globe, higher education is witnessing a seismic shift driven by the burgeoning power of AI. In Nigeria, universities are beginning to explore the potential of AI to transform teaching and learning, seeking to address long-standing challenges and unlock new opportunities for students and faculty alike. This literature review delves into the nascent landscape of AI in Nigerian university teaching, examining its applications, impacts, and remaining hurdles. Intel (2019) published a model for AI readiness in academic libraries. The model includes organizational readiness, which can be measured in terms of the availability of appropriate hardware and software. It also includes operational AI readiness, which is basically about the management mechanisms that need to be put in place for the effective adoption of AI.

The use of artificial intelligence in science education has indeed been established in a number of studies in various literatures. For instance, Cukurova et al. (2021) had a successful primary school mathematics class in which individual lessons were developed and implemented based on the results of automated learning data analysis of 44 teachers. Also, findings of the studies by Xue and Wang (2022), and Kim and Kim (2022) in which it was noticed that most teachers perceive AI positively, and they consider it as one of the pillars of science teaching is in consonance with the current discourse. Moreover, Huang and Qiao (2024) found out in their study that the experimental group of students' computational thinking abilities, learning motivation, and self-efficacy were all enhanced by the inclusion of science, technology, engineering, and mathematics (STEM) education in AI teaching.

Furthermore, Tai et al. (2024) were able to provide a significant link between Generative Artificial Intelligence and Science Education. These authors examined the use of large language models and determined that it offers new tools for the analysis of textual data which has the potential to provide educators with rich insights into both learners' performance and understanding of science education. In a similar vein, Al Darayseh (2023) in his study on the application of AI in science education noticed improvement. The foregoing thus provides an

establishment of fact regarding the significant impact of AI use in science education including the various opportunities it offers.

The promise of AI in Nigerian universities lies in its ability to cater to the diverse needs of a large and rapidly growing student population. Personalized learning is at the forefront of this transformation. AI-powered platforms can analyze individual student data, including learning styles, academic performance, and engagement levels, to recommend tailored learning materials, adjust the pace of instruction, and offer targeted feedback. Imagine a student struggling with a complex scientific concept being presented with an interactive tutorial tailored to their learning style, while another student breezes through the same material and is challenged with advanced problems. This dynamic differentiation caters to individual strengths and weaknesses, paving the way for deeper understanding and improved learning outcomes.

Beyond personalized learning, AI offers avenues for reimagining how students are assessed. Automated essay scoring systems can provide timely and objective feedback, reducing the burden on faculty while freeing them to engage in more meaningful interactions with students. Adaptive quizzes adjust difficulty based on student performance, offering personalized challenges and preventing frustration or boredom. Furthermore, AI-powered plagiarism detection tools can ensure academic integrity and foster a culture of honest learning. These advancements hold the potential to create a more efficient and effective assessment system, promoting continuous learning and growth.

The field of AI in education is constantly evolving, and Nigerian universities are well-positioned to contribute to this exciting journey. Research collaborations with international partners and local tech startups can foster innovation and develop AI solutions tailored to the specific needs of the Nigerian context. Building strong partnerships with policymakers and stakeholders is essential to secure funding, develop national AI education strategies, and bridge the digital divide. Most importantly, continuous faculty training and development programs are needed to equip educators with the skills and confidence to harness the power of AI and become agents of positive change in the Nigerian university landscape.

Statement of Problem

In the light of artificial intelligence's enormous potentials to transform science education, and the particular circumstances surrounding its restricted implementation, this study seeks to investigate the awareness and preparedness of Osun state University students.

Purpose of the Study

This study's main goal is to evaluate Osun State University students' awareness of and readiness for implementing artificial intelligence in science education. The study specifically seeks to:

1. Assess Osun State University students' awareness of artificial intelligence and its possible uses in scientific learning.
2. Find out how Osun State University students feel about the application of artificial intelligence in science learning.
3. Examine the level of preparedness of osun state University students in engaging with artificial intelligence as a tool and resource in learning science subjects.

Research Questions

1. What is the level of awareness among Osun State University students of artificial intelligence (AI) and its applications in science education?
2. What are the perceptions and attitudes of Osun State University students towards the use of artificial intelligence in science learning?
3. What is the level of preparedness of Osun State University students to engage with artificial intelligence as a tool and resource in learning science subjects?

RESEARCH METHODOLOGY

Research Design

This study employed a quantitative cross-sectional research design to assess the awareness and preparedness of Osun State University students towards adopting AI for teaching science subjects. The cross-sectional design allowed for a snapshot of students' perceptions and attitudes at a specific point in time.

Population of the Study

The target population for this study comprised of all undergraduate science students in Osun State University. The population was considered accessible and manageable for the study's scope.

Sampling and Sampling Techniques

A stratified random sampling method was employed to select a representative sample of students from each science department (Biology, Chemistry, Physics, Mathematics and Computer Science etc.). This method ensured that the sample reflects the diversity of the student population in terms of their academic backgrounds.

The sample size was determined using the Krejcie and Morgan sample size table, considering the target population size of 150 respondents, a confidence level of 95%, and an acceptable margin of error of 5%.

Research Instrument

Primary data were collected through a self-administered inventory designed to measure students' AI awareness, perceptions, attitudes, and preparedness. The inventory was developed based on a thorough review of relevant literature and piloted with a small group of students to ensure its clarity and effectiveness.

Validation of Research Instrument

The inventory was validated through a pilot study conducted with a small group of students to assess its clarity, comprehensiveness, and reliability. Pilot testing allowed for refinement of the inventory before its final administration.

Reliability of the Instrument

For suitability in the present study, the internal consistency method was used to establish the internal consistency of the instrument. The instruments were administered on forty (40) undergraduates students who were not part of the study sample, and their results were examined. Pearson Product Moment Correlation was used to establish the reliability coefficient of the instrument.

Procedure for Data Collection

The researcher distributed the inventory to the selected number of students. The completed inventories were collected for analysis.

Method of Data Analysis

Data collected from the inventory was analyzed using descriptive and inferential statistical techniques.

RESULTS

Table 1 presents the gender distribution of respondents. It shows that 44.0% are male while 56.0% are female.

TABLE 1
Respondent distribution by gender (N = 150)

	f	%
Male	66	44
Female	84	56
Total	150	100

Analyses of Research Questions

Research Question 1: What is the level of awareness among Osun State University students of artificial intelligence and its applications in science education?

TABLE 2
Analysis of the level of awareness among Osun State University students of artificial intelligence and its applications in science education (N=150)

S/N	ITEMS	Response			
		Strongly Agree	**Agree**	**Disagree**	**Strongly Disagree**
		f %	f %	f %	f %
1	Are Osun University students aware of AI technologies?	68 45.3%	61 40.7%	15 10.0%	6 4.0%
2	Are you familiar with the term “artificial intelligence”	62 41.3%	51 34.0%	21 14.0%	16 10.7%
3	I understand the basic principles behind how AI works.	70 46.7%	50 33.3%	15 10.0%	15 10.0%
4	I have used AI-powered tools or applications in my daily life.	53 35.3%	57 38.0%	29 19.3%	11 7.3%
5	I have heard of AI being used in education.	68 45.3%	45 30.0%	28 18.7%	9 6.0%
6	I am aware of specific examples of AI being used in science education.	51 34.0%	63 42.0%	22 14.7%	13 8.7%
7	I have the understanding that AI has the potential to improve science education.	56 37.3%	43 28.7%	39 26.0%	12 8.0%
8	I am convinced that AI can make science learning more engaging and interactive.	65 43.3%	51 34.0%	24 16.0%	10 6.7%
9	I consider AI as a tool that can personalize learning and cater to individual needs in science.	52 34.7%	60 40.0%	26 17.3%	12 8.0%
10	I am concerned that AI could replace teachers in science classrooms.	64 42.7%	49 32.7%	21 14.0%	16 10.7%
11	I am worried that AI could lead to students becoming overly reliant on technology for learning.	54 36.0%	73 48.7%	13 8.7%	10 6.7%

Table 2 presents the analysis of the level of awareness among Osun State University students of artificial intelligence and its applications in science education. The items the respondents agreed with were; Are Osun State university students aware of AI technologies? (86.0%), Are you familiar with the term "artificial intelligence" (75.3%), I understand the basic principles behind how AI works (80.0%), I have used AI- Powered tools or applications in my daily life (73.3%), I have heard of AI being used in education (75.3%), I am aware of specific examples of AI being used in science education (76.0%), I have the understanding that AI has the potential to improve science education (66.0%), I am convinced that AI can make science learning more engaging and interactive (77.3%), I consider AI as a tool that can personalize learning and cater for individual needs in science (74.7%), I am concerned that AI could replace teachers in science classroom (75.4%), I am worried that AI could lead to students becoming overly reliant on technology for learning (84.7%).

Research Question 2: What are the perceptions and attitudes of Osun State University students towards the use of artificial intelligence in science teaching?

TABLE 3

Analysis of the perceptions and attitudes of Osun State University students towards the use of artificial intelligence in science teaching (N=150)

S/N	ITEMS	**Respons**			
		Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**
		f %	f %	f %	f %
1	I would feel comfortable using AI- powered tools to learn science concept.	76 50.7%	33 22.0%	21 14.0%	20 13.3%
2	I am confident in my ability to navigate and use AI- powered science learning platform.	56 37.3%	56 37.3%	23 15.3%	15 10.0%
3	I am interested in exploring different types of AI- powered resources for sciences learning.	62 41.3%	40 26.7%	32 21.3%	16 10.7%
4	I would welcome the opportunity to use AI-powered tools to complete science assignments or projects.	65 43.3%	46 30.7%	28 18.7%	11 7.3%
5	I perceive that AI- powered tools can help me to learn science more effectively.	61 40.7%	37 24.7%	37 24.7%	15 10.0%

Table 3 presents the analysis of the perceptions and attitudes of Osun State University students towards the use of artificial intelligence in science teaching. The items the respondents agreed with were; I would feel comfortable using AI-powered tools to learn science concepts (72.7%), they am confident in my ability to navigate and use AI-powered science learning platforms (74.6%), they am interested in exploring different types of AI-powered resources for sciences learning (68.0%), they would welcome the opportunity to use AI- powered tools to complete science assignments or projects (74.0%), I perceive that AI- powered tools can help me to learn science more effectively (65.4%).

Research Question 3: What is the level of preparedness of Osun State University students to engage with artificial intelligence as a tool and resource in learning science subjects?

Table 4 presents the analysis of the level of preparedness of Osun State University students to engage with artificial intelligence as a tool and resource in learning science subjects. The items the respondents agreed with were; Are you prepared to engage in artificial intelligence as a tool

and resource in learning science subjects (79.3%), Are you prepared to explore different types of artificial intelligence as a tool and resource for science learning? (75.3%), Are you ready to use artificial intelligence as a tool and resource to learn science concepts? (66.0%), Are you ready to use artificial intelligence as a tool and resource to complete science assignments or project (72.0%).

TABLE 4

Analysis of the level of preparedness of Osun State University students to engage with artificial intelligence as a tool and resource in learning science subjects (N = 150)

S/N	ITEMS	Response	
		Yes	**No**
		f %	f %
1	Are you prepared to engage in artificial intelligence as a tool and resource in learning science subjects.	119 79.3%	31 20.7%
2	Are you prepared to explore different types of artificial intelligence as a tool and resource for science learning?	113 75.3%	37 24.7%
3	Are you ready to use artificial intelligence as a tool and resource to learn science concepts?	99 66.0%	51 34.0%
4	Are you ready to use artificial intelligence as a tool and resource to complete science assignment or project	108 72.0%	42 28.0%

DISCUSSIONS, CONCLUSION AND RECOMMENDATION

Discussions

Analysis of Research Question One in which the level of awareness among Osun State University students of artificial intelligence and its applications in science education was investigated revealed that the level of awareness among Osun State University students of artificial intelligence and its applications in science education is considerably positive. The items the respondent agree on were that; Osun State University students are aware of AI technologies, they are familiar with the term "Artificial Intelligence", they understand the basic principles behind how AI works, they have used AI-powered tools or applications in their daily lives and have heard of AI being used in education. It was also revealed that the students have the understanding that AI has the potential to improve science education, they are convinced that AI can make science learning more engaging and interactive.

The results aligned with previous research conducted by Adeshina (2021) and Olalekan & Nwachukwu (2020) whose works showed that the level of awareness of students in Nigerian universities regarding artificial intelligence and its application in science education is progressively increasing yet remains varied across different institutions and disciplines. According to them many students in science and technology programs are becoming familiar with AI concepts through coursework and research projects, however the integration of AI into the curriculum is still in its early stages in some universities, leading to disparities in awareness and understanding. While there are concerted efforts by certain universities to incorporate AI into their educational frameworks, often facilitated by partnerships with tech companies and international collaborations, other institutions lack the necessary infrastructure and faculty expertise to effectively teach and apply AI in science education (Adeshina, 2021; Olalekan & Nwachukwu, 2020). Additionally, student-led initiatives and workshops play a crucial role in

promoting AI awareness and providing practical experience, although these efforts are often localized and dependent on external funding and resources (Chibueze, 2022).

However, this differs from the work of other researchers whose findings revealed that despite the global surge in AI integration into various scientific disciplines, Nigerian students often remain uninformed or under-informed about these developments due to inadequate educational infrastructure and insufficient curriculum updates (Adebayo, 2021; Eke, 2020). A study by Nwankwo and Afolabi (2022) highlights that most university programs in Nigeria lack comprehensive courses on AI, leading to a gap in students' knowledge and application skills in scientific research and innovation. This deficiency hampers their ability to engage with contemporary scientific methodologies and reduces their competitiveness in the global job market (Ogunleye, 2021). Addressing this issue requires a concerted effort to update educational curricula, improve teaching resources, and foster partnerships between academic institutions and technology industries to provide students with practical exposure to AI technologies.

Analysis of Research Question Two which sought to establish the perceptions and attitudes of Osun State University students towards the use of artificial intelligence in science learning provided a clue into the actual perceptions and attitudes of Osun State University students towards the use of artificial intelligence in science teaching. The items the respondents agreed with were that; they would feel comfortable using AI-powered tools to learn science concepts, they are confident in their abilities to navigate and use AI-powered science learning platforms, they are interested in exploring different types of AI-powered resources for sciences learning, they would welcome the opportunity to use AI- powered tools to complete science assignments or projects, they perceive that AI- powered tools can help them learn science more effectively.

These findings are in line with previous studies (Afolayan & Oni, 2022) who showed that many students appreciate AI's ability to provide personalized learning, automate repetitive tasks, and offer interactive and adaptive learning tools that make complex scientific concepts more accessible and engaging.

However, there are concerns among some students about the potential for AI to replace human educators and reduce job opportunities in the teaching profession (Okonkwo & Udechukwu, 2021). Additionally, the uneven access to AI technologies across different regions and institutions has led to disparities in perceptions, with students in well-resourced universities demonstrating more enthusiasm and optimism compared to their counterparts in less privileged settings (Olumide & Adebola, 2023).

Many students perceive AI as a threat to traditional teaching methods, believing that it may replace human educators and lead to a depersonalized learning experience (Oladejo, 2022). This skepticism is often compounded by limited exposure to AI technology and a lack of adequate training on its benefits and applications in the educational context (Adekunle, 2021). Additionally, cultural attitudes towards technology, which sometimes lean towards skepticism and resistance to change, further reinforce these negative perceptions (Eze, 2023). These differ from the results of the findings of this research work.

Analysis of Research Question Three where the level of preparedness of Osun State University students to engage with artificial intelligence as a tool and resource in learning science subjects was established revealed the following. A very large majority of the respondents agreed that: they are prepared to engage in artificial intelligence as a tool and resource in learning science subjects, they are prepared to explore different types of artificial intelligence as a tool and resource for science learning, they are ready to use artificial intelligence as a tool and resource to learn science concepts and they are ready to use artificial intelligence as a tool and resource to complete science assignments or projects. In conformity with the research of Adebayo & Olamide (2022) whose work revealed that the level of

preparedness of Nigerian students to engage with AI as a tool and resource in learning science subjects is varied and often hinges on factors such as access to technology, quality of educational infrastructure, and availability of skilled educators. According to them, more technologically advanced universities, students exhibit a higher level of preparedness characterized by familiarity with AI concepts, access to modern learning tools, and participation in AI-focused academic programs. However, a significant proportion of students in less resourced institutions face challenges such as inadequate access to AI tools, limited exposure to practical applications, and a shortage of educators' proficient in AI technologies (Nwankwo et al., 2021). Moreover, the digital divide and varying levels of technical literacy further exacerbate disparities in preparedness, making it difficult for many students to fully leverage AI in their science education (Chukwuemeka & Onwuegbuzie, 2023). Addressing these gaps through targeted educational reforms and increased investment in technology infrastructure is crucial for equipping Nigerian students with the skills needed to effectively use AI in their scientific learning (Oluwadare, 2020).

In contrast to the results of the analysis of this study, it has been found that Nigerian students are generally underprepared to engage with AI as a tool and resource in learning science subjects, due to several critical factors. A significant barrier is the inadequate technological infrastructure in many educational institutions, which limits students' access to AI technologies and relevant learning materials (Akinlade & Osuntokun, 2021). Additionally, there is a lack of specialized training and curriculum that integrates AI with science education, leaving students without the necessary skills to effectively utilize AI tools (Olumide et al., 2022). Furthermore, the disparity in technological proficiency and access between urban and rural areas exacerbates this preparedness gap, as students in less privileged regions often have minimal exposure to modern educational technologies (Ajayi & Ogunleye, 2023).

Conclusion

In this research, a result of the survey of the awareness and preparedness of Osun state University students towards adopting artificial Intelligence for teaching subjects has been presented and discussed. Based on the findings from this study, it has been revealed that there is a high level of awareness among Osun state students on artificial Intelligence and its application in science education. The perception and attitude of the respondents towards the use of artificial Intelligence has been found to be very positive and finally, the study showed that there is a high level of preparedness amongst Osun state University students to engage with artificial intelligence as a tool and resource in learning science subjects.

Recommendations

Based on the findings related to the awareness and preparedness of Osun state University students towards adopting artificial Intelligence for teaching subjects, here are some recommendations:

i. Osun state University should make efforts to integrate artificial Intelligence into science instruction materials.
ii. The government and management of tertiary Institutions should create focused interventions to improve AI awareness and readiness.
iii. Educational institutions in Nigeria and other developing nations should look to include artificial Intelligence into their science and study curricula.
iv. Government should improve the funding and provision of digital equipment to create enabling environment for optimal integration of artificial Intelligence into the learning system.

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