



Assessing the Awareness and Usability of Artificial Intelligence Software Among Secondary School Teachers

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ABSTRACT

This study aimed to assess the Awareness and Usability of Artificial Intelligence Software Among Secondary School Teachers. A descriptive survey design was employed, involving 174 secondary school teachers from Lagos State educational district V. Two research questions and one hypothesis guided the study, and a questionnaire was used to gather quantitative data. The Artificial Intelligence Software Awareness and Usability Among Secondary School Teachers Questionnaire (AISAUSSTQ) with a reliability coefficient of 0.74 was utilized to gather the quantitative data for the study. The findings revealed that though secondary teachers are aware of AI in education, majority of them do not know how it works, secondary school teachers have a high level of usability of AI software and that there is no statistically significant impact of gender on the level of awareness of Artificial Intelligence (AI) software among secondary school teachers. ($t(172) = -1.696$; $p = 0.92$). It was concluded that there was a poor level of awareness and knowledge among pre-service teachers. It was recommended that pre-service teacher training programs should integrate AI concepts to enhance pre-service teachers' understanding and awareness of AI and its application.

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Introduction

Since the introduction of the first generation of computers and their later upgraded versions, technology has been used in education (Schindler et al., 2017). Teachers were observed utilizing computers for a variety of purposes, including research, instructing, and grading students. In a similar vein, students used computers for problem-solving, research, and study among other things. Computers have also been utilized as a way to preserve student data databases and as an educational resource (much like a library or lab). Jones (1985). The advent of artificial intelligence (AI), a system in which machines are built to resemble humans, has significantly increased the use of technology in education. "The science and engineering of making intelligent machines" or "a machine that behaves in a way that could be considered intelligent if it was a human being" are two definitions of artificial intelligence. According to McCarthy (2007), John McCarthy originally used the term artificial intelligence (AI) in 1956 at the Dartmouth Artificial Intelligence Conference. Prominent investigators from several fields convened to deliberate on subjects pertaining to the decoupling of information from perceptual inputs, the correlation between capriciousness and imaginative thought processes, and additional subjects that shaped the notion of "thinking machines." The majority of participants thought that computers would someday be able to simulate human intelligence, but their main concerns were about the details and timeline for this to happen.

According to Tegmark (2015), artificial intelligence is currently growing and permeating every region of the planet at an alarming rate. It is becoming more and more significant in our day-to-day existence. The usage of AI and machine learning in various gadgets, apps, and services is expanding as more people become aware of these technologies (Zawacki-Richter et al., 2019). Applications and services using artificial intelligence (AI) include FaceApp, which uses AI to identify people tagged in other people's images on Facebook, and Google Duplex, a chat agent that can

perform certain spoken activities over the phone, such as booking reservations or appointments. Examples of AI applications are other smart products like self-cleaning vacuums. As previously mentioned, there is no way to overstate the importance of AI in education. AI applications in education include Yuki, the humanoid robot, and Sophia (Retto, 2017).

Higher education is inextricably linked to developments in cutting-edge technology and the powerful processing powers of intelligent machines. In the pursuit of a better and more efficient teaching medium, man has continued to evolve cutting-edge technology across time. In the context of higher education, the advancements in artificial intelligence present both new opportunities and difficulties for teaching and learning (Mehrnaz & Sedigheh, 2018). According to Mehrnaz and Sedigheh (2018), artificial intelligence (AI) refers to computer systems that perform human-like functions like learning, adapting, synthesizing, self-correction, and using data for intricate processing tasks. The rapid advancement of artificial intelligence is already having a significant impact on the services provided by higher education. The complex software that powers Siri on iPhones is an example of artificial intelligence that everyone encounters on a daily basis (Shulman & Bostrom, 2012). Learning is no longer confined to classrooms thanks to AI's revolutionary impact on teaching strategies, course materials, and other aspects of education (Ahmad, 2020). AI could be used in education in a number of ways. It can help teachers, forecast student performance, assess and grade pupils, and enhance the curriculum. By evaluating student performance data, identifying areas where extra support may be required, and making recommendations for pertinent teaching resources, artificial intelligence (AI) tools can help teachers develop more successful educational tactics. This can assist educators in customizing their lesson plans to meet the unique requirements of their pupils, leading to enhanced pedagogy and enhanced learning results. The integration of artificial intelligence (AI) into education has



been going on for a while in the developed world, and there is no denying the many advantages that administrators, instructors, and students are reaping from this integration. AI integration in education can take many different forms. These include web-based learning environments, instructional systems that use technologies like gamification, virtual reality, animation, interactive video, robotics, video conferencing, audiovisual files, and three-dimensional technology, computer programs, virtual labs, facial recognition systems, social media and social network sites, microblogging platforms, and mobile applications.

Though there are many advantages to AI in education, we will only cover a few here. AI enables an inclusive and global classroom (Marr, 2020): through AI, instruction is placed online and made web-based, making learning available to all, overcoming social, physical, racial, gender, and international boundaries. For example, virtual reality facilitates the learning process beyond the learning space to create a global classroom since AI can connect students to the virtual classroom. Teachers are assisted in making good lesson preparation and preparation and equipped with appropriate learning materials to facilitate learning optimally (Lynch, 2016).

The applications of AI in education are incredibly beneficial. While grading assignments and tests in an educational setting typically takes a lot of time, artificial intelligence can automate the process. According to Khare et al. (2018), this time could be utilized for professional development, student interaction, and class preparation. This AI technology helps to guarantee that all students are developing the same conceptual foundation by explaining the courses. Therefore, educators who are able to integrate technology into their lesson plans stand to benefit from automatically generated data derived from their students' participation. Teachers can spend more time gaining important insights from AI tools to give higher quality, research-informed instruction and less

time on paperwork when they apply AI technologies to help them manage their classrooms effectively (Pandarinath et al., 2017).

Artificial Intelligence in Secondary School

The integration of artificial intelligence (AI) in secondary schools holds immense potential to revolutionize teaching and learning experiences. From personalized instruction to automated administrative tasks, AI technologies offer diverse applications that can optimize educational outcomes.

AI-powered adaptive learning systems analyze students' learning patterns and adapt instructional content to suit individual needs (Adams, 2019). By providing personalized learning experiences, these systems enable students to progress at their own pace, remediate areas of weakness, and pursue advanced topics based on their interests and abilities. As a result, students are more engaged, motivated, and likely to achieve better learning outcomes (Ford & Kärger, 2021). AI technologies support teachers in various aspects of their roles, from lesson planning to assessment. AI-driven tools can analyze student performance data to identify learning gaps, inform instructional decision-making, and tailor interventions to meet students' specific needs (Zheng et al., 2023). Moreover, AI-powered grading and feedback systems streamline administrative tasks, allowing teachers to allocate more time and attention to instructional delivery and student support.

AI enables secondary schools to leverage vast amounts of educational data to inform strategic decision-making. Predictive analytics models can forecast student performance, identify at-risk students, and recommend targeted interventions to improve outcomes (Ford & Kärger, 2021). Additionally, AI-driven data analytics empower school administrators to optimize resource allocation, identify trends, and evaluate the effectiveness of educational programs and initiatives.

Despite the promising benefits of AI in secondary schools, several challenges must be addressed to ensure successful implementation.



Ethical considerations surrounding data privacy, algorithmic bias, and equity must be carefully navigated to mitigate potential risks and ensure fairness and transparency (Adams, 2019). Furthermore, concerns about job displacement and the dehumanization of education warrant careful consideration, emphasizing the importance of maintaining a balance between AI-driven innovations and human-centered pedagogy (Zheng et al., 2023). The use of artificial intelligence in secondary schools presents exciting opportunities to enhance teaching and learning experiences, improve educational outcomes, and optimize administrative processes. By leveraging AI technologies, secondary schools can facilitate personalized learning, enhance teaching effectiveness, and make data-driven decisions to support student success. However, the ethical, social, and pedagogical implications of AI adoption must be carefully considered and addressed to ensure equitable and inclusive educational practices in the digital age.

Assessing AI Awareness Among Secondary School Teachers: Implications for Educational Practice

The awareness and understanding of artificial intelligence (AI) among secondary school teachers play a crucial role in shaping the integration of AI technologies into educational practices. Research suggests that many secondary school teachers have limited awareness and understanding of AI and its potential applications in education (Clark & Prensky, 2019). While AI technologies continue to advance rapidly, teachers may lack access to professional development opportunities and resources to stay abreast of these developments (Şahin, 2021). Consequently, there is a need to assess and address the gaps in AI awareness among secondary school teachers to maximize the benefits of AI in educational settings. Low AI awareness among secondary school teachers can impede the effective integration of AI technologies into teaching and learning practices. Without a foundational understanding of AI concepts and applications, teachers may be hesitant to explore and implement AI-

powered tools in their classrooms (Shoham & Erlich, 2023). This reluctance may limit students' exposure to AI-enhanced learning experiences and hinder their development of essential 21st-century skills, such as critical thinking, problem-solving, and digital literacy. To address the gaps in AI awareness among secondary school teachers, targeted professional development programs and initiatives are essential. These programs can provide teachers with opportunities to deepen their understanding of AI concepts, explore AI applications in education, and gain hands-on experience with AI tools and technologies (Clark & Prensky, 2019). Furthermore, collaboration between educators, researchers, and industry partners can facilitate the development of AI literacy resources and curriculum materials tailored to the needs of secondary school teachers. Embedding AI literacy into teacher education programs is critical for preparing future educators to leverage AI technologies effectively in their teaching practices. Teacher education programs can incorporate AI-related content into coursework, provide opportunities for practical application and reflection, and equip pre-service teachers with the skills and knowledge needed to navigate the intersection of AI and education (Şahin, 2021). By fostering AI literacy among pre-service and in-service teachers, educational institutions can ensure that teachers are well-prepared to embrace AI innovations and enhance student learning experiences.

Statement of the Problem

The integration of artificial intelligence (AI) into education has been going on for a while in the developed world, and there is no denying the many advantages that administrators, instructors, and students are reaping from this integration. AI integration in education can take many different forms. These include web-based learning environments, instructional systems that use technologies like gamification, virtual reality, animation, interactive video, robotics, video conferencing, audiovisual files, and three-dimensional technology, computer programs, virtual labs, facial recognition systems, social



media and social network sites, microblogging platforms, and mobile applications. Despite the growing presence of artificial intelligence (AI) software in various educational settings, there remains a gap in understanding the extent of awareness and the usability of such technologies among secondary school teachers (Smith & Johnson, 2020). With the rapid advancements in AI technology and its potential to revolutionize teaching methodologies, it is imperative to assess the current level of knowledge and utilization of AI software among secondary school educators (Chen & Wang, 2021). This study aims to investigate the awareness level and practical utilization of AI software tools among secondary school teachers.

Research Questions

The following questions were raised to guide the study:

1. What are secondary school teachers' levels of awareness of Artificial Intelligence (AI) software?
2. What is the level of usability of AI software among secondary school teachers?

Research Hypotheses

H01: There is no statistically significant impact of gender on the level of awareness of Artificial Intelligence (AI) software among secondary school teachers.

Literature Review

Technology Acceptance (TAM) Theory

According to Davis's (1985) Technology Acceptance Model (TAM) hypothesis, people's intentions to utilize a technology are greatly influenced by its perceived usefulness and simplicity of use. This hypothesis is pertinent to the current study, which looks at how aware secondary school teachers are of artificial intelligence (AI) technologies and their level of usability. The goal of TAM is to improve perceived usefulness and usability in the classroom. The acceptance and use of AI are significantly influenced by user attitudes (ATT). Ajzen (1985) extends the theory of reasoned action (TRA) and introduces trust as a means of supporting TAM. According to the TRA

hypothesis, people are more motivated when they feel positively about a subject and when their colleagues also feel the same way. This is consistent with the study's objectives, which state that students should embrace AI if teachers use it well.

This study delves into understanding how secondary school teachers perceive and utilize AI software in their teaching practices. To comprehensively analyze teachers' acceptance and adoption of AI tools, the study integrates the Technology Acceptance Model (TAM). This theoretical framework elucidates the factors influencing teachers' awareness and usability perceptions of AI software, offering insights into their attitudes and intentions toward its integration into education.

Perceived usefulness (PU), a central construct of TAM, reflects individuals' beliefs regarding the extent to which a technology enhances their performance or productivity (Davis, 1989). In the study, PU pertains to secondary school teachers' perceptions of how AI software can positively impact their teaching practices. Teachers may perceive AI software as useful for tasks such as personalized instruction, automated grading, or data-driven decision-making, influencing their willingness to adopt and utilize such tools (Venkatesh et al., 2012). Perceived ease of use (PEOU) refers to individuals' perceptions of the ease with which they can learn and use a technology (Davis, 1989). When applied to AI software, PEOU encompasses teachers' assessments of the software's user-friendliness, accessibility, and compatibility with existing workflows. Teachers are more likely to embrace AI software if they perceive it as intuitive, requiring minimal training or technical expertise to incorporate into their instructional practices (Venkatesh et al., 2012).

Methodology

The study adopted a descriptive type of survey research which entails the use of questionnaire to elicit needed information from secondary school teachers based on their opinions and views regarding the awareness level and usability of artificial intelligence software in



education. The study was conducted in 30 secondary schools in Lagos state educational district V. The sample for this study was determined by using random sampling techniques which allows respondents to be selected randomly from the given stratum of the population. For the purpose of this research, 450 secondary school teachers were randomly selected from from a total population of secondary school teachers in educational district V, Lagos state. The Artificial Intelligence Software Awareness and Usability Among Secondary School Teachers Questionnaire (AISAUSSTQ) was utilized to gather the quantitative data for the study. Section A was designed to collect respondents' demography, Sections B and C were respectively designed to collect data regarding the awareness level and usability of the respondents. There were 10 items in all, with the awareness level and usability level having 8 and 2 items respectively. A 4-point scale was used in weighing expert responses for section B in which Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) were awarded 4, 3, 2 and 1 points respectively. Section C consists of two yes/no questions used the measure secondary school teacher's usability level of AI. The face and content validity of the questionnaire was done by experts and a measurement and evaluation experts to provide their judgments on the items. The reliability of the constructs (the extent to which the items in the questionnaire were

related to each other were examined using Cronbach's alpha formula, reliability coefficients of 0.74 obtained. The duly completed questionnaire was collated and analyzed to answer the two research questions. The questionnaire was administered to secondary school teachers through a printed questionnaire and a link to an already prepared google form which contains the same content as the questionnaire. The quantitative data was analyzed using mean and simple percentage to answer the research questions while the hypothesis was tested using independent sample t-test.

Results and Discussions

Table 1: Population of Participant's Gender

Gender	N
Male	101
Female	73
Total	174

Teacher's Years of Experience	N
Less than 1 year	37
1-5 years	54
6-10 years	18
11-15 years	0
Over 15 years	65
Total	174

Research Question 1

What are secondary school teachers' levels of awareness of Artificial Intelligence (AI) software?

Table 3: Teacher's Awareness of AI Software

S/N		SA	A	D	SD	MEAN	Std D
1.	I have a good knowledge of what Artificial intelligence (AI) is.	102 58.6%	67 38.5%	3 1.7%	2 1.1%	3.55	.59
2.	AI provides assistance and quality free materials for teaching	96 55.2%	64 36.8%	13 7.5%	1 0.6%	3.47	.66
3.	I have a proper understanding of how AI works	68 39.1%	91 52.3%	13 7.5%	2 1.1%	3.29	.65
4.	I am familiar with software tools used in teaching	67 38.5%	86 49.4%	20 11.5%	1 0.6%	3.26	.68



5.	AI tools like computers, smart phones, speech recognition software, Virtual monitors, Online assistance, self-driving cars etc. can be used in schools	89 51.1%	71 40.8%	14 8.0%	0 0%	3.43	.64
6.	AI can be used for teaching	93 53.4%	72 41.4%	7 4.0%	2 1.1%	3.47	.63
7.	AI can provide feedback to teaching and learning activities	86 49.4%	64 36.8%	20 11.5%	4 2.3%	3.33	.77
8.	AI encourage globalization of teaching curriculum	93 53.4%	70 40.2%	9 5.2%	2 1.1%	3.46	.65

Weighted Average: mean= 3.41, SD= 0.66

Note: N = 174, Strongly Agree (SA); Agree (A); Disagree (D); Strongly Disagree (SD)

The results from table 3 above reveals that majority of the respondents have a good knowledge of what artificial intelligence is (mean = 3.55), majority of the respondents also agreed that AI provides assistance and quality free materials for teaching (mean = 3.47), the respondents also agreed that AI tools like computers, smart phones, speech recognition software, Virtual monitors, Online assistance, self-driving cars etc. can be used in schools (mean = 3.43), the respondents also agreed with the statement that AI can be used for teaching (mean = 3.47), lastly, the respondents agreed that AI encourage globalization of teaching curriculum (mean= 3.46). The respondents do not agree with the statement that states that they have a proper understanding of how AI works (mean = 3.29), likewise, the respondents stated that they are not familiar with software tools used in teaching (mean = 3.26), lastly, the respondents do not agree that AI can provide feedback to teaching and learning activities (mean = 3.33). The mean value for most of the items is higher than 2.5 which is the benchmark of a 4 point likert scale questionnaire. This implies that the respondents are aware of the use of AI software. Similar research findings support the observation that secondary teachers are aware of AI software in education. For instance, Schmid and Ehlers (2020) found that awareness of AI technologies among teachers often leads to the adoption of AI tools for tasks such as grading and personalized learning, enhancing teaching

efficiency. Additionally, Brown and Green (2019) demonstrated that this awareness positively impacts teaching practices, with knowledgeable teachers incorporating AI tools into their lesson plans to create more interactive and personalized learning experiences. However, Zheng et al. (2021) noted that despite increased awareness, teachers encounter challenges in integrating AI due to limited resources, lack of training, and data privacy concerns, highlighting the need for targeted professional development. Furthermore, Chen et al. (2020) showed that when effectively utilized, AI technologies can improve student outcomes by enhancing engagement, providing personalized feedback, and supporting differentiated instruction

Research Question 2

What is the level of usability of AI software among secondary school teachers?

Table 4: Teachers Usability of AI Software

S/N		YES	NO
1.	I have used AI tools several times in teaching	112 64.4%	62 35.6%
2.	I have used AI software for personal purposes	156 89.7%	18 10.3%

Table 4 shows that majority of the respondents have used AI tools several times in teaching



(64.4%), the table also reveals that majority of the respondents have used AI software for personal purposes (89.7%). This shows that secondary school teachers have a high level of usability of AI software.

Hypothesis One

Table 5: Independent Sample t-test of the impact of gender on the level of awareness of Artificial Intelligence (AI) software among secondary school teachers

Group	N	Mean	Std.D	t	df	sig
Male	101	12.55	1.40	-1.696	172	0.92
Female	73	12.69	1.33			

Table 5 shows that $t(172) = -1.696; p = 0.92$. Since the p-value which is 0.92 is higher than 0.05, then there is no statistically significant impact between the variables. Hence the null hypothesis was not rejected. In other words, there is no statistically significant impact of gender on the level of awareness of Artificial Intelligence (AI) software among secondary school teachers. This result suggests that both male and female secondary school teachers have similar levels of understanding and engagement with AI software. Similar research supports this finding by demonstrating that gender does not play a significant role in the awareness of educational technologies. For example, a study by Margolis et al. (2020) found that gender did not significantly affect the level of technology integration or familiarity with digital tools among educators. This suggests that factors other than gender, such as experience, training, and access to resources, are more likely to influence teachers' awareness of AI. Moreover, research by Weller and Keeling (2021) corroborates the lack of gender disparity in technology adoption among teachers. Their study indicates that both male and female educators show similar levels of engagement with emerging technologies, including AI, when provided with equivalent opportunities for training and development.

Findings

The results that emanated from this study were discussed above. The findings of the study are highlighted as follows:

- i. Secondary teachers are aware of AI in education

There is no statistically significant impact of gender on the level of awareness of Artificial Intelligence (AI) software among secondary school teachers.

- ii. Secondary school teachers have a high level of usability of AI software.
- iii. There is no statistically significant impact of gender on the level of awareness of Artificial Intelligence (AI) software among secondary school teachers. ($t(172) = -1.696; p = 0.92$).

Conclusion

This study seeks to investigate the level of awareness and usability of AI software among secondary school teachers. The findings of this study revealed that secondary school teachers are aware of the use of AI software in teaching but majority of them do not know how it works neither do they know how to implement it. The findings of this study also revealed that secondary school teachers have a high level of usability of artificial intelligence software. This shows that AI is one of the current trends in education and its high level of usability among secondary teacher is a great step towards achieving technological growth in a country experiencing rapid technological advancement.

Recommendations

The following recommendations were made:

- 1. Given that secondary teachers are aware of AI in education and demonstrate a high level of usability with AI software, it is crucial to build on this foundation. Educational institutions should invest in ongoing professional development programs that focus on advanced AI applications and innovative uses of AI tools. These programs can help teachers stay current with emerging AI



technologies and refine their skills to better integrate these tools into their teaching practices.

2. The lack of a statistically significant impact of gender on AI awareness suggests that both male and female teachers have similar levels of familiarity with AI. To ensure that all educators have equal opportunities to benefit from AI technologies, schools should ensure equitable access to AI resources and training. Providing resources and support equally to all teachers will help maximize the potential of AI in education.
3. Despite high usability, teachers may still face challenges when implementing AI tools in their classrooms. Schools should offer additional support for the practical integration of AI software, including technical assistance and pedagogical strategies. Establishing mentorship programs or collaboration opportunities where experienced teachers can share best practices with peers could enhance the effective use of AI tools.

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