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An Assessment of Artificial Intelligence (AI)-Enhanced Classroom on Teacher's Productivity in Lagos State Education District V

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Abstract

This study investigated an assessment of Artificial intelligence AI Enhanced Classroom on Teacher's Productive in Lagos State Education District V. The study population consisted of 10 senior secondary schools in Lagos State Educational District V. Simple random sampling techniques was used to select one school from each zonal under the selected Education District. On the other hand, 25 teachers were chosen at random from each chosen school using a purposive sampling technique making a total of 100 participants. This study used a 4-point Likert scale questionnaire to generate the data. Hypotheses were tested using Pearson's Product Moment

Correlation Coefficient Analysis. ($\beta = 0.242$, $p < 0.05$) Study results showed that artificial intelligence AI Enhanced Classroom has a positive effect on Teachers' Productive in Lagos State Education District V. It was recommended that educational policymakers and administrators in Lagos State Educational District V take additional steps to integrate AI-enhanced classrooms, given the study's strong findings and encouraging educators to work together and share knowledge in a positive environment helps hasten the adoption of AI technologies.

Keywords: *Artificial Intelligence, Assessment, Educational District, Enhanced classroom, and Teacher productivity.*

Introduction

Artificial intelligence (AI) has become a widespread component of modern society, influencing many different fields and causing revolutionary shifts in some industries, changing the fundamental nature of our work and lifestyles (Konecki, et al., 2023, Vacarelu, 2023). Artificial intelligence (AI) techniques and technology have been more widely used in educational contexts, especially in classrooms, in recent years. Even though these AI-enhanced classrooms stand out the possibility of raising teacher productivity and student learning results, it is important to assess the dynamics and effects of AI adoption. This study aims to address some important issues: While AI is being used in classrooms to improve teaching and learning, there isn't much empirical data to support how much AI enhances student performance in terms of engagement, academic accomplishment, critical thinking, and problem-solving abilities. It's crucial to comprehend how useful AI tools are in various educational settings. UNESCO (2019), states that there are three ways in which AI and education are linked: learning with AI (using AI tools in the classroom), learning about AI (its technologies and approaches), and getting ready for AI (enabling all citizens to understand the potential impact of AI on human life). Within computer science lies the field of artificial intelligence (AI) (Palanivelu & Vasanthi, 2020). It entails creating computer programs to carry out operations that would typically need human intelligence (Mpu & Adu, 2019). AI algorithms are capable of learning, perceiving, solving problems, comprehending language, and using logic (Mpu & Adu, 2019). Numerous academics have stated that since artificial intelligence (AI) has the potential to accelerate the fourth industrial revolution, it will pose a serious threat to management systems in organizations (Ziyad, 2019). Artificial intelligence (AI) has been widely used in educational practices (Artificial Intelligence in Education; AIEd) with the advancement of computing and information processing techniques. AI applications in education include intelligent

tutoring systems, teaching robots, learning analytics dashboards, adaptive learning systems, and human-computer interactions (Chen, Xie, & Hwang, 2020). AI has been regarded as a potent instrument to enable new paradigms for instructional design, technological development, and education research that are otherwise hard to build in traditional education modes since the launch of AIEd about three decades ago (Holmes et al., 2019; Hwang et al., 2020). This study assessed the relevance of AI on teachers' productivity in Lagos State Educational District V.

Research Objectives

The purpose of this study was to investigate the impact of Artificial Intelligence (AI)-Enhanced Classroom on teachers' productivity in Lagos State Education District V**.**

Research Question

i. Is there a significant relationship between AI-enhanced classrooms and teachers' productivity in Lagos State Education District V?

Research Hypotheses

i. There is no significant relationship between AI-enhanced classrooms and teachers' productivity in Lagos State Education District V.

Literature Review

The fast advancement of science and technology has led to significant changes in society and the economy, as well as changes in the characteristics of the labour market. These factors have made 21st-century skills (21st CS) necessary (Global Partnership for Education [GPE], 2020). "The skills, knowledge, and expertise students must master to excel in job and life" is the definition of the 21st-century curriculum (Partnership for 21st Century Skills, 2009). Making learning more relevant and responsive is the goal of teaching 21st-century computer science (Lavi et al., 2021). Thus, teachers have a civic and academic duty to provide these abilities to their pupils (Gündüz & Akkoyunlu, 2019; Khoiri et al., 2021).

The first programmes to implement this approach should be teacher education programs, which will help students investigate, consider, and use these abilities in their field service projects (Valtonen et al., 2021). This knowledge is especially important for education students because they will be the ones teaching their future students how to build these skills (Shidiq & Yamtinah, 2019).

The national educational goals of several countries have stressed 21st-century skills in response to the demands of the times (Niu et al., 2021; Afandi et al., 2019). The primary tactic used by the states to adapt the teaching and learning process to the demands of the time is integrating 21st-century computer science into the basic education curriculum (Makmee, 2021). However, in terms of practical teaching methods, these skills play a far smaller role (Gelmez Burakgazi et al., 2019). The body of research on studies done for 21st-century computer science education shows less than ideal results (Chu, et al., 2021; Urbani et al., 2017). This is a major issue since educators who were taught using the outdated teaching paradigm lack the abilities needed to create a learning environment where students can learn the 21st CS (Bedir, 2019). According to Haviz et al. (2020), research investigations of these talents from diverse viewpoints and essential domains must be conducted because they have become a global issue.

The current study closes a gap in the literature on teacher education by concentrating on 21st-century computer science teaching practices, which emphasize creativity and innovative thinking, communication, teamwork, and critical thinking. The following research questions were specifically addressed: How much do 21st-century computer science teaching approaches emphasize creativity & inventive skills, communication, critical thinking, and teamwork? To what extent do 21st-century computer science teaching approaches predict students' academic success, either individually or in combination?

Teacher Productivity

According to Chouhan (2014), competence is a critical quality that determines how someone acts or thinks in many contexts and changes with time. Furthermore, competence is an action with observable results (Campbell et al., 2013). Though there is ongoing discussion on the definition and meaning of the term productivity. The aim of Schippmann et al. (2010) is to modify the definitions put forward by Bartman et al. (2012). Productivity, according to Bartman et al. (2012), is a collection of actions that contribute to reaching the intended result. Stated differently, capability refers to an individual's capacity to use or utilise their knowledge, skills, abilities, behaviours, and personal traits to complete a challenging task in a certain role or position.

Tucker and Cofsky (2004) suggest that productivity consists of five primary components: (i) knowledge, which is the information and knowledge that an individual possesses; (ii) skills, which are the abilities to carry out specific tasks; (iii) self-concept and values, which are the attitudes,

values, and self-image of an individual; Characters: (iv) the capacity to carry out tasks in his or her sector; and (v) motives: feelings, wants, bodily needs, or impulses to take action. A person's ability to carry out tasks under loose supervision is significantly influenced by the interaction of reason and natural forces. High performance is influenced by these five essential behaviours that make up competence.

The Challenges of 21st Century Learning Skills in Every Classroom

It is not new, but the importance of 21st-century abilities has increased (Schmoker, 2011). Indeed, teachers are only now realising that fundamental concepts and methods are what matter most when it comes to 21st-century learning skills. These days, this word is often discussed in many forums and conversations, as well as being a common topic for seminars and workshops. In formal terms, the twenty-first century—also referred to as the Common Era—began on January 1, 2001, and will officially finish on December 31, 2099. This is the current Anno Domini year. But what about education in the twenty-first century, is so different from that of the past that we have to invest time, resources, and money to study, investigate, and comprehend it for our benefit? Schools were characterised very differently in the twentieth century than they are today. Most students' activities are solo, with very little done in groups. Instructors evaluate students using a summative assessment system that includes certain formative aspects, best expressed as a percentage or numerical value. The instructor was the only source of information in the teacher-centric classroom. Most of the learning was restricted to a few procedures. The sole goal of the teaching methods is for the pupils to learn; they do not address individual distinctions that are of little importance to them, frequently have no currency, or provide them with no context. Most thinking abilities were created to be unstructured and lower order. During this period, kids were also taught how to use technology and were given instructions on how to accomplish tasks. Rules governed students' self-management, and they had little or no say in the framework. Academic advancement was achieved through single-level instruction; acceleration was prioritised for bright and talented children; read/write and auditory learning methods predominated. There was also very little feedback. The Framework for 21st Century Learning is a cohesive, group vision for learning that was created by the Partnership for 21st Century Learning (P21) in 2015. This framework, which combines content knowledge, specialised skills, expertise, and literacies, outlines the knowledge, abilities, and competencies students need to acquire to excel both in the workplace and in life. All pupils must acquire fundamental academic subject knowledge and comprehension to implement

any 21st-century talent. Critical thinkers and good communicators need to start with a foundation of fundamental academic subject knowledge. Students must acquire the necessary abilities for success in the modern world, such as critical thinking, problem-solving, communication, and teamwork, within the framework of key knowledge education. According to the Asian Development Bank (2016), leaders, educators, and students work together to create 21st-century learning. Today's media-rich, instantaneous, rapid, dynamic, engaging, and instantaneous electronic and digital world, which implies instant pleasure through communication, shapes students in part (Nakrani, A., 2013). Millennials, Neo-Millennials, Digital Natives, Digital Children, and 21st Century Learners are some of the terms used to describe today's students. They are motivated and engaged, and gain knowledge from the usage of digital technology because of regular exposure to a range of digital media. They seem to be wired to use digital media and are proficient with it. Students create, develop, and assess processes in addition to material. In addition, they receive the opportunity to apply numerous intelligence and learning styles more comprehensively, all while managing their education according to moral and ethical principles. Feedback is also obtained from a variety of sources, including peers, teachers, and oneself.

Empirical Review

The study of Salido (2023), titled Impact of AI-Powered Learning Tools on Student Understanding and Teachers' Performance, discussed the introduction of artificial intelligence into the field of education is driving a fundamental shift in the approaches to teaching and educational practice that are now in use. The primary purpose of this research is to evaluate the effect that artificial intelligence-driven educational resources, such as intelligent tutoring systems and virtual learning environments, have on the academic performance and comprehension of students. The findings suggest that artificial intelligence has the potential to bring about a huge revolution in the field of education by making it possible to personalize and adjust students' educational experiences in a way that boosts both students' academic performance and their overall level of comprehension. Despite this, it is necessary to recognize the ethical repercussions that may result and the limitations that may be imposed by the infrastructure. This highlights the importance of the responsible incorporation of artificial intelligence. In a nutshell, the findings of this research shed light on the considerable influence that artificial intelligence could potentially have on the field of education. When it comes to putting AI into educational settings, it is essential to consider pedagogical, ethical, and infrastructure considerations, as this article explains. It accomplishes this

to foster equitable and improved educational experiences while preserving the core principles that underpin education.

Sandhya, and Varghese, (2023). posit that the education industry is only one of the many industries that have been impacted by technology and its achievements. The pedagogy and tactics used by educational institutions across the globe for instruction make clear how technology has been incorporated into the education sector. Blended learning has garnered significant interest owing to its diverse character, which encompasses the integration of traditional in-person instruction with online and electronic media. Because integrating technology necessitates processing vast volumes of student data, its sensitive and private nature can also give rise to ethical quandaries and issues. The numerous facets of technology integration in the educational system are the main topic of this chapter, along with the useful ramifications for improving student learning and engagement. to serve as a guide for the next studies on creating an educational model that can enhance teaching and learning environments.

Wang, Li, Tan, Yang, and Lei, (2023), assert that when it comes to integrating artificial intelligence (AI) into the classroom, teachers are leading the way. It is anticipated that they will acquire sufficient comprehension of AI and turn into knowledgeable educators and users. The success of AI-enhanced education depends on their preparedness for its application. The current study examined the interrelationships between the four components of AI readiness—cognition, ability, vision, and ethics in the use of AI in education—as well as the consequences for the work of instructors. 3164 primary school teachers' data were gathered, and cluster analysis and partial least square structural equation modelling were used to analyse it. This study discovered a favourable correlation between ethical considerations and cognition, ability, and vision in the educational usage of AI. The four aspects of AI-ready were all positively correlated with AI-enhanced innovation, which in turn was positively correlated with teachers' job satisfaction. However, perceived risks from AI were adversely correlated with AI readiness. Based on the teachers' degrees of AI preparation, this study divided the teachers into three groups. Instructors who demonstrated high levels of AI preparedness also tended to see fewer dangers from AI, exhibit high levels of AI-enhanced innovation, and report higher levels of job satisfaction. Nonetheless, there were no appreciable disparities between instructors from different socioeconomic backgrounds and genders in terms of their preparedness for AI and how it will affect their work.

This study has significant implications for the creation of tactics and regulations supporting effective AI-enhanced education as well as providing empirical support for the significance of AI ready for teachers' work. Despite the similarities between this study and previous research, the previous studies did not look at the students' academic performance and teachers' productivity in AI-enhanced classrooms.

Methodology

A descriptive survey research design was employed by the researcher. This aids in supplying data regarding the impact of the independent variables. As a result, the researcher presented the data exactly as it happened, without changing any of the factors. Teachers at Lagos State Education District V's senior secondary schools were the study's target group. 3514 teachers in the district made up this group. Although junior and senior secondary school teachers work in the district, only the senior secondary school teachers are surveyed. District V comprises Ajeromi/Ifelodun, Amuwo-Odofin, Badagry, and Ojo zone. One hundred teachers made up the study's sample. The sample was selected using simple random sampling techniques to select 1 school from each zone and a purposive sampling technique was used to select 25 teachers. On the other hand, 25 teachers were chosen at random from each chosen school, making a total of 100 participants.

Instrumentation

This study on Artificial Intelligence and Teachers Productivity Questionnaire (AITPQ) adopted a self-developed questionnaire. The reliability quality of the questionnaire was assessed using Pearson's Product Moment Correlation Coefficient, which came out at 0.72. However, the researcher created the Artificial Intelligence and Teachers Productivity Questionnaire (AITPQ), which consists of five components. The 4-point Likert-type rating scale Strongly Agree (4 points), Agree (3 points), Disagree (2 points), and Strongly Disagree (1 point) was used to score the item. Using Pearson's product-moment correlation coefficient, the questionnaire has undergone the necessary validation, yielding a reliability 0.72 coefficient.

With the principal’s agreement, the researcher was able to visit the schools in person and deliver the questionnaire to the researcher with the assistance of two research assistants who had received training. The significance of the study and the anonymity of their answers were sufficiently explained to the respondents. Pearson's Product Moment Correlation Coefficient was used to

analyse the data that was gathered. The sample was created using simple random sampling procedures and proportionate stratified sampling. Two instructors were chosen at random from each of the 2% of the zone's schools that were chosen.

Result Presentation and Analysis

H_{o1}: There is no significant relationship between AI-enhanced classrooms and teachers' productivity in Lagos State Education District V.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.775[a]	.739	.715	.67845

a. Predictors: (Constant), AI-enhanced classrooms

Table 2: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.691	1	4.691	13.637	.000[b]
	Residual	33.724	98	.344		
	Total	38.415	99			

a. Dependent Variable: Teachers Productivity

b. Predictors: (Constant), AI-enhanced classrooms

Table 3: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.679	.063		13.156	.000
	AI-enhanced classrooms	.242	.029	.775	5.439	.000

a. Dependent Variable: Teachers' Productivity

Summary of Findings

The above analysis shows the model summary of the significant effect of AI-enhanced classrooms on teachers' productivity in Lagos State Educational District V. The table revealed that there is a strong level of fitness at an R-value of 0.775, R^2 of 0.739, and an F-value of F= 45.553. The R^2 of 73.9% of AI-enhanced classrooms explains teachers' productivity by the regression model.

Also, the R-value of 0.775 in the table implied that there exists a significant and positive effect of the independent variable on the dependent variable (i.e. AI-enhanced classrooms on teachers' productivity). This also helps to authenticate the regression result stated in the hypothesis. In furtherance, the results revealed that at a 95% confidence level, AI-enhanced classrooms (β = 0.242, $p< 0.05$), have a positive and statistical effect on teachers' productivity as their P-values were less than 0.05.

Therefore, since the F-sig. (p-value) of 0.000 is less than (0.05), which implies that AI-enhanced classrooms affect teachers' productivity. Therefore, the null hypothesis which previously stated that AI-enhanced classrooms do not have a significant effect on teachers' performance in Lagos State Educational District V was rejected while the alternative is accepted.

Discussion of Findings

The hypothesis indicates a strong level of fitness, with an R-value of 0.775, R^2 of 0.739, and an F-value of 45.553. The R^2 of 73.9% suggests that AI-enhanced classrooms explain a substantial portion of teachers' productivity in Lagos State Educational District V. The coefficient analysis reveals a positive and statistically significant effect of AI-enhanced classrooms on teachers' productivity ($\beta = 0.242$, $p < 0.05$). The F-sig. (p-value) of 0.000, being less than 0.05 indicates that the effect is significant. Therefore, the null hypothesis is rejected, concluding that AI-enhanced classrooms do have a significant effect on teachers' productivity. This result was supported by Wang, Li, Tan, Yang, and Lei, (2023), who assert that when it comes to integrating artificial intelligence (AI) into the classroom, teachers are leading the way. They are anticipated to acquire a sufficient comprehension of AI and become knowledgeable educators and users. The results from the hypotheses consistently indicate that AI-enhanced classrooms play a significant role in affecting teachers' productivity in Lagos State Educational District V. The high R^2 values suggest that a substantial proportion of teachers' performance can be explained by the presence of AI-enhanced classrooms. These findings contribute to the growing body of literature on the impact of technology in educational settings, specifically highlighting the positive relationship between AI-

enhanced classrooms and teachers' productivity in the context of Lagos State Educational District V.

Conclusion

In conclusion, the comprehensive analysis conducted on the assessment of Artificial intelligence AI Enhanced Classroom on Teacher's Productive in Lagos State Educational District V yielded compelling results. One main hypothesis formed the basis of the inquiry, which examined the impact and influence of AI-enhanced classrooms on the productivity of teachers. The hypothesis results categorically refute the null hypothesis and demonstrate that AI-enhanced classrooms do, in fact, significantly improve teacher effectiveness. Strong fitness is highlighted in the model summary, which has an astounding R-value of 0.775 and 73.9% explanatory power. The positive and statistically significant effect is further highlighted by the coefficients analysis, which has a beta value of 0.242 and a p-value less than 0.05. The null hypothesis is firmly rejected by the total statistical significance, which is shown by an F-sig. value of 0.000. This strong evidence supports the idea that teachers' productivity is positively impacted by AI-enhanced classrooms.

In synthesis, these findings collectively contribute valuable insights to the ongoing discourse surrounding the integration of technology in educational settings. The results underscore the positive correlation between AI-enhanced classrooms and enhanced teachers' productivity in Lagos State Educational District V. This study serves as a noteworthy addition to the body of knowledge on educational technology, providing empirical support for the notion that embracing AI in classrooms can lead to tangible improvements in teachers' performance. As educational institutions continue to navigate the evolving landscape of technology in education, these findings offer practical implications and avenues for further exploration, emphasizing the potential benefits of AI-enhanced learning environments for educators in Lagos State Educational District V.

Recommendations

It is advised that educational policymakers and administrators in Lagos State Educational District V take additional steps to integrate AI-enhanced classrooms, given the study's strong findings. This could entail offering teachers training courses to improve their ability to use AI tools. Furthermore, encouraging educators to work together and share knowledge in a positive environment helps hasten the adoption of AI technologies. It will be crucial to continuously observe and assess how AI-enhanced classrooms affect teachers' productivity to improve and optimize these teaching

strategies. Moreover, engaging in partnerships with technology providers to ensure access to cutting-edge AI tools can contribute to sustained advancements in the quality of education in the district.

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