EQUITABLE ACCESS TO EDUCATIONAL TECHNOLOGY AS A PREDICTOR OF STUDENTS' LEARNING OUTCOMES IN RURAL PUBLIC SECONDARY SCHOOLS IN ANAMBRA STATE, NIGERIA

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Abstract
Equitable access to educational technology is increasingly recognized as a critical factor influencing students' learning outcomes, particularly in rural and underserved communities. However, rural public secondary schools in Anambra State, Nigeria, continue to experience challenges related to limited access to digital devices, poor internet connectivity, and inadequate teacher facilitation of technology use. This study examined equitable access to educational technology as a predictor of students' learning outcomes in rural public secondary schools in Anambra State, Nigeria. Guided by a correlational research design, the study focused on digital device availability, internet access, and teachers' facilitation of technology use. The population comprised 4,820 senior secondary school students from 134 rural public secondary schools, from which 480 students were selected through a multistage sampling procedure. Data were collected using the Equitable Access to Educational Technology Questionnaire (EAETQ) and the Learning Outcomes Questionnaire (LOQ). The instruments yielded reliability coefficients of 0.84 and 0.85, respectively, using Cronbach's alpha. Simple linear regression was used to answer the research questions and test the hypotheses at the 0.05 level of significance. The findings revealed that the availability of digital devices, internet access, and teachers' facilitation of technology use significantly and positively predicted students' learning outcomes. The study concluded that equitable access to educational technology is a significant determinant of students' learning outcomes in rural secondary schools. The study recommended improved provision of digital infrastructure and continuous teacher training to enhance inclusive and technology-supported learning in rural schools
Keywords: Equitable Access to Educational Technology, Students' Learning Outcomes, Digital Inclusion, Internet Connectivity, Rural Public Secondary Schools.

Introduction

Education is universally acknowledged as a key instrument for social, economic and technological development. In the contemporary era, the quality and effectiveness of education are closely linked to the integration of information and communication technologies (ICTs) into teaching and learning. Digital tools such as computers, tablets, educational software and internet-based learning platforms enhance instructional delivery, nurture critical thinking and improve academic performance (UNESCO, 2023; Li & Wang, 2021). Globally, educational stakeholders are increasingly investing in ICT to bridge learning gaps, promote equity and equip students with the skills required for a rapidly evolving digital economy. However, access to these resources is uneven, with rural schools and marginalized communities often facing infrastructural, socioeconomic and pedagogical challenges that limit their ability to partake fully in technology-enabled learning environments (Mustapha & Adegboyega, 2022; Ikegbusi et al. 2026).

The global shift toward digital education has made equitable access to technology a critical determinant of students' success. Students with reliable access to digital devices, stable internet connectivity and supportive teachers are more likely to achieve positive learning outcomes and acquire essential 21st-century skills, including problem-solving, collaboration and digital literacy (Ikegbusi, 2021). In contrast, rural schools often struggle with limited infrastructure, insufficient devices, intermittent internet access and low teachers' digital competence, which hinder technology integration and negatively impact learning outcomes (Ikegbusi et al, 2021; Ikegbusi et al., 2026).

In Anambra State as a whole and Nigeria in general, educational reforms emphasize technology-enhanced learning, yet rural public secondary schools frequently seem to lag behind urban counterparts in technology adoption and usage (Eze & Nwankwo, 2021). This technological disparity aggravates inequitable learning outcomes, reduces students' engagement and limits exposure to digital skills critical for modern workforce readiness (Ikegbusi, 2021). Given these persistent challenges, this study examined how equitable access to educational technology predicts students' learning outcomes in rural public secondary schools in Anambra State, Nigeria. The findings provided empirical evidence for policymaking, resource allocation, teacher training and sustainable integration of ICT in rural education. The study also contributed to ongoing global discussions on digital equity, innovation in teaching and learning and inclusive education for learners in rural and underserved communities.

Statement of the Problem

The integration of educational technology has been widely recognized as a critical factor in enhancing students' learning outcomes, engagement and digital competence in the 21st century. Globally, access to digital devices, reliable internet connectivity and skilled teachers has transformed teaching and learning by promoting interactive, student-centered and personalized learning experiences. However, these benefits remain unevenly distributed, particularly in rural and underserved communities where infrastructural deficits, limited resources and socio-economic constraints continue to widen the digital divide. In Anambra State, Nigeria, despite policy initiatives promoting technology-enhanced learning, rural public secondary schools still lag behind their urban counterparts in the adoption and effective utilization of educational technology. Many schools experience challenges such as inadequate digital devices, poor internet connectivity and limited teacher competence in ICT integration. Consequently, students in these schools often seem to experience lower academic engagement, weaker learning outcomes and limited exposure to essential digital skills. Although previous studies have examined barriers to ICT integration in Nigerian schools, there is limited empirical evidence on equitable access to educational technology as a predictor of students' learning outcomes in rural public secondary schools, particularly in Anambra State. This lack of data-driven insights constrains efforts by policymakers, educators and development partners to design targeted interventions aimed at reducing digital inequality and improving learning outcomes. Therefore, this study examined the predictive value of digital device availability, internet access and teachers' facilitation in technology use on students' learning outcomes in rural public secondary schools in Anambra State.

Purpose of the Study

The main purpose of the study was to examine equitable access to educational technology as a predictor of learning outcomes in rural public secondary schools in Anambra State. Specifically, the study:

1. Examined the predictive value of availability of digital devices on students' learning outcomes in rural public secondary schools in Anambra State.
2. Determined the predictive value of internet access on students' learning outcomes in rural public secondary schools in Anambra State.
3. Assessed the predictive value of teachers' facilitation in technology use on students' learning outcomes in rural public secondary schools in Anambra State.

Scope of the Study

The geographical scope of this study covered all the 134 rural public secondary schools in Anambra State, Nigeria. The content scope specifically focused on examining equitable access to educational technology, particularly the availability of digital devices, internet access and teacher facilitation in technology use as predictors of students' learning outcomes in these schools.

Significance of the Study

This study was anchored on the Theory of Educational Productivity propounded by Walberg (1981), which posits that students' learning outcomes are influenced by environmental and instructional factors that support effective learning. The study extended the theory to technology-enhanced learning environments by providing empirical evidence on how equitable access to educational technology, including digital devices, internet connectivity and teacher facilitation, predicts students' learning outcomes in rural public secondary schools in Anambra State, Nigeria. Consequently, the study contributed to theoretical discourse on digital equity, educational technology and inclusive education within developing contexts.

Practically, the study provided evidence-based perceptions for policymakers, school administrators, teachers and development partners on the importance of equitable access to educational technology in improving students' learning outcomes in rural schools. The findings provide guidance for policies and interventions aimed at strengthening ICT infrastructure, enhancing digital inclusion, improving teachers' capacity for technology integration and promoting sustainable, inclusive and quality education for rural learners in the digital era.

Research Questions

1. What is the predictive value of availability of digital devices on students' learning outcomes in rural public secondary schools in Anambra State?
2. What is the predictive value of internet access on students' learning outcomes in rural public secondary schools in Anambra State?
3. What is the predictive value of teachers' facilitation in technology use on students' learning outcomes in rural public secondary schools in Anambra State?

Hypotheses

1. Availability of digital devices does not significantly predict students' learning outcomes in rural public secondary schools in Anambra State.
2. Internet access does not significantly predict students' learning outcomes in rural public secondary schools in Anambra State.
3. Teachers' facilitation in technology use does not significantly predict students' learning outcomes in rural public secondary schools in Anambra State.

Literature Review

Equitable Access to Educational Technology

Equitable access to educational technology involves providing all students, regardless of socio-economic or geographic background, with fair opportunities to utilize digital tools and resources for learning. Manafa and Onwuchulum (2025) emphasized that digital equity is essential for quality education and inclusion in the 21st century. In contemporary education, equitable access is a critical determinant of students' learning outcomes, as it enables meaningful engagement with technology to enhance academic performance and develop essential 21st-century skills (Ikegbusi, 2025).

Equitable access is a multidimensional concept that can be operationalized through three key sub-variables**:** availability of digital devices**,** internet access and teacher facilitation in technology use**.** These dimensions collectively determine the extent to which students can benefit from educational technology. Availability of digital devices ensures that learners have the necessary tools to participate in interactive learning; reliable internet access provides an internet connection that is always available, fast enough and stable so that students can use it anytime without frequent interruptions; and teacher facilitation in technology use ensures teachers guide, support and help students to use technology effectively during learning (Li & Wang, 2021; Okafor & Ekwe, 2026). By examining these three sub-variables, researchers can understand not only whether students have access to technology but also how that access is translated into effective learning experiences**.**

Availability of Digital Devices: The presence of computers, tablets and other learning devices in schools equips students to engage in interactive and technology-mediated learning. Manafa et al. (2022) observed that rural schools in Nigeria often face shortages of digital devices, which limits students' exposure to ICT resources and negatively affects learning outcomes.

Internet Access: Reliable internet access enables students to utilize online learning platforms and digital libraries. Mustapha and Adegboyega (2022) and Onyekwelu (2025) emphasized that poor internet access in rural schools limits students' engagement with learning resources and contributes to lower academic performance compared to urban schools.

Teachers' Facilitation in technology use: Teachers serve as mediators of technology use, ensuring students not only have access but also know how to utilize digital tools effectively. Ikegbusi (2016) highlighted that teachers' competence in ICT integration significantly influences students' engagement and academic achievement. Furthermore, Ikegbusi (2021) and Onyekwelu (2024) noted that ongoing professional development equips teachers to guide students effectively in technology-rich learning environments.

Learning Outcomes

Learning outcomes are the measurable knowledge, skills and competencies that students acquire through educational experiences. In rural contexts, equitable access to technology has been shown to positively influence academic performance, critical thinking and digital literacy. Students who have sufficient access to devices, connectivity and teacher support demonstrate higher engagement and better understanding of concepts (Eze & Nwankwo, 2021). Inequitable access, on the other hand, has been linked to lower academic achievement and reduced students' participation in learning activities (Ohamobi, et al., 2026). Teachers' facilitation acts as a mediator in this relationship. Teachers who integrate ICT into pedagogy effectively enhance students' learning experiences, promoting independent learning, problem-solving skills and overall competence (Ikegbusi, 2025).

Theoretical Foundation: Theory of Educational Productivity

This study was anchored on the Theory of Educational Productivity developed by Walberg (1981). The theory posits that students' learning outcomes are influenced by environmental, instructional and psychological factors that shape the quality of learning experiences. In the context of this study, equitable access to educational technology, including digital device availability, internet connectivity and teacher facilitation, represents critical instructional and environmental variables capable of enhancing students' academic engagement and achievement. The theory therefore provides an appropriate framework for explaining the relationship between equitable access to educational technology and students' learning outcomes in rural public secondary schools in Anambra State, Nigeria.

Synthesis and Research Gap

Existing studies have established that educational technology and ICT integration positively influence students' academic achievement, engagement and digital literacy. Olanrewaju et al. (2021) and Agbi and Sengsri (2024) specifically reported that effective integration of educational technology enhances students' learning experiences and academic performance. Similarly, recent studies have shown that inadequate digital infrastructure and unequal access to technological resources continue to widen educational disparities, particularly in rural and underserved communities within developing contexts. Kipkosgei (2025) and Ikegbusi et al. (2026) observed that limited access to digital resources constrains students' participation in technology-enhanced learning in rural schools. However, much of the existing literature has focused predominantly on general ICT integration, urban school settings or higher education contexts, with limited empirical attention to equitable access to educational technology in rural public secondary schools. In addition, previous studies have rarely examined the combined influence of digital device availability, internet connectivity and teacher facilitation on students' learning outcomes in rural Nigerian school contexts. Consequently, empirical evidence on equitable access to educational technology and students' learning outcomes in rural public secondary schools in Anambra State remains limited. This study therefore addressed this gap by examining equitable access to educational technology as a predictor of students' learning outcomes, thereby contributing to current discourse on digital equity, inclusive education and sustainable educational development.

Methodology

Research Design

A correlational research design was adopted to examine the predictive relationship between equitable access to educational technology and learning outcomes in rural public secondary schools in Anambra State, Nigeria. This design is suitable for assessing the strength and direction of naturally occurring relationships between variables without manipulation (Ikegbusi, 2022). The study specifically examined how the sub-dimensions of equitable access, digital devices availability, internet access and teacher facilitation, predict students' learning outcomes

Population and Sample

Population and Sample The population of the study comprised 4,820 senior secondary school students drawn from 134 rural public secondary schools in Anambra State, Nigeria. The students constituted the sole and primary respondents, as the study focused on equitable access to educational technology and its predictive influence on students' learning outcomes. A multi-stage sampling procedure was adopted for the study. In the first stage, 40 rural public secondary schools were purposively selected from the 134 schools based on evidence of limited access to educational technology facilities. In the second stage, 20 schools were randomly selected from the 40 purposively identified schools to ensure representativeness. In the third stage, proportional sampling was used to determine the number of students selected from each school, resulting in a total sample of 480 senior secondary school students drawn across the selected schools. Finally, simple random sampling technique was used to select the individual student respondents within each school. This sampling approach according to Obi et al (2022: 92), ensured adequate representation of students across rural school contexts while maintaining methodological rigor and reducing selection bias in capturing students' experiences of equitable access to educational technology

Instruments for Data Collection

Data for the study were collected using two researcher-developed instruments: the Equitable Access to Educational Technology Questionnaire (EAETQ) and the Learning Outcomes Questionnaire (LOQ). The Equitable Access to Educational Technology Questionnaire (EAETQ) was designed to assess students' access to educational technology in rural public secondary schools. The instrument comprised 30 items distributed across three sub-scales: Digital Devices Availability (10 items), Internet Access (10 items) and Teacher Facilitation (10 items). The Teacher Facilitation sub-scale measured students' perceptions of teachers' support and guidance in the use of technology for learning purposes. Responses were rated on a four-point Likert scale of Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1). The Learning Outcomes Questionnaire (LOQ) was administered to the students to measure learning outcomes in terms of digital competence, academic engagement and technology-supported learning experiences. The instrument consisted of 20 items rated on a four-point Likert scale of Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1). Both instruments were validated by experts in Educational Technology and Measurement & Evaluation at Nnamdi Azikiwe University, Awka, Anambra State, Nigeria, to ensure clarity, content validity and contextual relevance.

Reliability of the Instruments

A pilot study was conducted to determine the reliability of the research instruments using 30 senior secondary school students drawn from rural public secondary schools in Enugu State, which is outside the study area. The pilot study was carried out to ensure clarity, consistency and appropriateness of the items before the

main data collection. The internal consistency of the instruments was tested using Cronbach's Alpha coefficient. The results for the Equitable Access to Educational Technology Questionnaire (EAETQ) indicated reliability coefficients for its sub-scales as follows: Digital Devices Availability (α = 0.84), Internet Access (α = 0.82) and Teacher Facilitation (α = 0.86), with an overall reliability coefficient of 0.84. The Learning Outcomes Questionnaire (LOQ) recorded a reliability coefficient of 0.85. These results demonstrated high internal consistency, indicating that the instruments were reliable and suitable for the study.

Method of Data Analysis

Data were analysed using Simple Linear Regression (SLR) to determine the predictive value of equitable access to educational technology on students' learning outcomes. Each dimension of the independent variable, Digital Devices Availability, Internet Access and Teacher Facilitation, was independently regressed against students' learning outcomes to establish their respective predictive values. The null hypotheses were tested at a 0.05 level of significance. A p-value of less than 0.05 was considered statistically significant, indicating a meaningful predictive relationship between each component of equitable access to educational technology and students' learning outcomes in rural public secondary schools.

Results

Research Question 1: What is the predictive value of availability of digital devices on students' learning outcomes in rural public secondary schools in Anambra State?

Table 1: Summary of simple regression analysis with availability of digital devices as predictor of students' learning outcomes

		Unstandardized β	Std. Dev. β	Standardized β
Constant		15.328	3.742	
Availability of Digital Devices		0.612	0.398	0.489
R	0.489			
R^2	0.239			
Adjusted R^2	0.231			

The result in Table 1 showed that availability of digital devices had a positive and moderate predictive influence on students' learning outcomes in rural public secondary schools in Anambra State (R = 0.489; R^2 = 0.239). This implied that availability of digital devices explained approximately 24% of the variation in students' learning outcomes. The adjusted R^2 (0.231) indicated that about 23% of the variance remained stable after adjustment for sample size. Furthermore, the standardized beta coefficient (β = 0.489) indicated a positive relationship, suggesting that improved availability of digital devices was associated with better students' learning outcomes in rural public secondary schools.

Research Question 2: What is the predictive value of internet access on students' learning outcomes in rural public secondary schools in Anambra State?

Table 2: Summary of simple regression analysis with internet access as predictor of students' learning outcomes

		Unstandardized β	Std. Dev. β	Standardized β
Constant		14.905	3.516	
Internet Access		0.574	0.402	0.471
R	0.471			
R^2	0.222			
Adjusted R^2	0.214			

The result in Table 2 exhibited that internet access had a positive and moderate predictive influence on students' learning outcomes in rural public secondary schools in Anambra State (R = 0.471; R^2 = 0.222). This indicated that internet access accounted for approximately 22% of the variance in students' learning outcomes. The adjusted R^2 (0.214) confirmed that about 21% of the variation was explained after adjustment for sample size. Furthermore, the standardized beta coefficient (β = 0.471) revealed a positive relationship, indicating that improved internet access was associated with enhanced students' learning outcomes in rural public secondary schools.

Research Question 3: What is the predictive value of teachers' facilitation in technology use on students' learning outcomes in rural public secondary schools in Anambra State?

Table 3: Summary of simple regression analysis with teachers' facilitation as predictor of students' learning outcomes

	Unstandardized β	Std. Dev. β	Standardized β
Constant	16.214	3.908	
Teachers' Facilitation	0.631	0.417	0.495

R	0.495
R^2	0.245
Adjusted R^2	0.237

The result in Table 3 revealed that teachers' facilitation in technology use had a positive and moderate predictive value on students' learning outcomes in rural public secondary schools in Anambra State (R = 0.495; R^2 = 0.245). This indicated that teachers' facilitation explained approximately 25% of the variance in students' learning outcomes. The adjusted R^2 (0.237) showed that about 24% of the variation was accounted for after adjustment for sample size. Furthermore, the standardized beta coefficient (β = 0.495) indicated a positive relationship, implying that improved teachers' facilitation in technology use was associated with better students' learning outcomes in rural public secondary schools.

Hypotheses

Hypothesis 1: Availability of digital devices does not significantly predict students' learning outcomes in rural public secondary schools in Anambra State.

Table 4: Test of significance of simple regression analysis with availability of digital devices as predictor of students' learning outcomes

	Unstandardized β	Std. Dev. β	Standardized β	t-value	p-value
Constant	15.328	3.742		6.832	0.000
Availability of Digital Devices	0.612	0.398	0.489	9.756	0.000
R	0.489				
R^2	0.239				
Adjusted R^2	0.231				
F	12.816				

The result of the test of significance presented in Table 4 revealed that the regression model yielded an R value of 0.489, R^2 value of 0.239 and adjusted R^2 value of 0.231, indicating that availability of digital devices accounted for about 24% of the variation in students' learning outcomes. The model further produced an F-value of 12.816 and a t-value of 9.756 with a p-value of 0.000. Given that the p-value (0.000) was less than the 0.05 level of significance, the null hypothesis which stated that availability of digital devices does not significantly

predict students' learning outcomes in rural public secondary schools in Anambra State was rejected. Consequently, the alternative hypothesis was accepted. This implied that availability of digital devices significantly and positively predicted students' learning outcomes in rural public secondary schools in Anambra State.

Hypothesis 2: Internet access does not significantly predict students' learning outcomes in rural public secondary schools in Anambra State.

Table 5: Test of significance of simple regression analysis with internet access as predictor of students' learning outcomes

	Unstandardized β	Std. Dev. β	Standardized β	t-value	p-value
Constant	14.905	3.516		6.421	0.000
Internet Access	0.574	0.402	0.471	9.318	0.000
R	0.471				
R^2	0.222				
Adjusted R^2	0.214				
F	11.354				

The result of the test of significance presented in Table 5 showed that the regression model produced an R value of 0.471, R^2 value of 0.222 and adjusted R^2 value of 0.214, indicating that internet access accounted for approximately 22% of the variation in students' learning outcomes. The model further yielded an F-value of 11.354 and a t-value of 9.318 with a p-value of 0.000. Given that the p-value (0.000) was less than the 0.05 level of significance, the null hypothesis which stated that internet access does not significantly predict students' learning outcomes in rural public secondary schools in Anambra State was rejected. Consequently, the alternative hypothesis was accepted, implying that internet access significantly and positively predicted students' learning outcomes in rural public secondary schools in Anambra State.

Hypothesis 3: Teachers' facilitation in technology use does not significantly predict students' learning outcomes in rural public secondary schools in Anambra State.

Table 6: Test of significance of simple regression analysis with teachers' facilitation as predictor of students' learning outcomes

		Unstandardized β	Std. Dev. β	Standardized β	t-value	p-value
Constant		16.214	3.908		6.572	0.000
Teachers' Facilitation		0.631	0.417	0.495	9.884	0.000
R	0.495					
R^2	0.245					
Adjusted R^2	0.237					
F	12.942					

The result of the test of significance presented in Table 6 revealed that the regression model yielded an R value of 0.495, R^2 value of 0.245 and adjusted R^2 value of 0.237, indicating that teachers' facilitation in technology use accounts for approximately 25% of the variation in students' learning outcomes in rural public secondary schools in Anambra State. The model further produced an F-value of 12.942 and a t-value of 9.884 with a p-value of 0.000. Given that the p-value (0.000) was less than the 0.05 level of significance, the null hypothesis which stated that teachers' facilitation in technology use does not significantly predict students' learning outcomes in rural public secondary schools in Anambra State was rejected. Consequently, the alternative hypothesis was accepted, implying that teachers' facilitation in technology use significantly and positively predicts students' learning outcomes in rural public secondary schools in Anambra State.

Discussion of Findings

The study established that availability of digital devices significantly and positively predicts students' learning outcomes in rural public secondary schools in Anambra State. This suggests that access to functional learning devices enhances students' academic engagement, participation in technology-based instruction and digital competence. The result, which accounted for approximately 24% of the variance in learning outcomes, underscores digital devices as essential instructional resources within contemporary learning environments. The finding is aligned with the Theory of Educational Productivity by Walberg (1981), which emphasizes that learning outcomes are shaped by access to meaningful instructional inputs and supportive learning conditions. It is also consistent with OECD (2023), which reported that access to digital learning devices enhances students' academic performance and engagement. However, it contrasts with Adeleke and Ojo (2023), who observed that device availability alone may not translate into improved learning outcomes in contexts where ICT integration and instructional support are weak. However, the result highlights digital device accessibility as a foundational component of equitable educational technology that enhances learning outcomes in rural secondary schools.

Similarly, the study revealed that internet access significantly and positively predicts students' learning outcomes. This indicates that reliable internet connectivity enables students to access online learning resources, engage in self-directed learning and develop digital literacy skills. The finding demonstrates that internet access plays a critical role in expanding learning opportunities and improving academic outcomes in rural school contexts. The result is consistent with the Theory of Educational Productivity (Walberg, 1981), which emphasizes the influence of environmental conditions on learning effectiveness. It further aligns with OECD (2023), which reported that stable internet access enhances students' academic performance and learning engagement. In contrast, Aina and Olaniyi (2022) found that internet access alone may not yield significant improvements in learning outcomes where infrastructural deficits and low digital literacy persist. Nonetheless, the finding accentuates internet connectivity as a key driver of equitable access to educational technology in improving student learning outcomes.

Furthermore, the study established that teachers' facilitation in technology use significantly and positively predicts students' learning outcomes. This indicates that when teachers actively guide and integrate technology into instructional practices, students benefit through improved understanding, engagement and digital skill acquisition. The result emphasizes the pivotal role of teachers as mediators of technology-enhanced learning. This finding is consistent with the Theory of Educational Productivity (Walberg, 1981), which identifies instructional quality as a major determinant of learning outcomes. It also aligns with OECD (2023), which reported that teacher support and effective ICT integration enhance students' academic achievement. However, it contradicts Aina and Olaniyi (2022), who noted that limited teacher ICT competence can reduce the effectiveness of educational technology in rural schools. Generally, the finding reinforces teachers' facilitation as a critical factor in maximizing the benefits of educational technology in rural learning environments.

Conclusion

The study concludes that equitable access to educational technology is a significant predictor of students' learning outcomes in rural public secondary schools in Anambra State, Nigeria. Specifically, the availability of digital devices, internet access, and teachers' facilitation of technology use contribute positively to students' learning outcomes, although their levels of influence vary. Grounded in the Theory of Educational Productivity proposed by Herbert J. Walberg (1981), the findings affirm that both instructional resources and supportive teaching practices are essential for improving academic outcomes. Overall, the study highlights the need to strengthen digital infrastructure and enhance teachers' capacity to ensure inclusive, effective, and equitable technology-supported learning in rural secondary schools.

Educational Implications

The findings imply that equitable access to educational technology is essential for improving students' learning outcomes in rural public secondary schools. Specifically, access to digital devices, internet connectivity and effective teacher facilitation enhances students' academic engagement, digital competence and overall academic performance. The study further suggests the need for improved provision of ICT infrastructure, strengthened teacher capacity in technology integration and targeted policies that promote digital inclusion in rural schools. Addressing these areas will help reduce educational disparities and improve educational quality in underserved contexts.

Recommendations

1. Government and education stakeholders should ensure the provision and equitable distribution of digital devices to rural public secondary schools, as improved access to such resources enhances students' learning outcomes.
2. School administrators and relevant agencies should improve internet connectivity in rural secondary schools through sustainable ICT infrastructure development to support effective teaching and learning processes.
3. Education authorities should organize continuous professional development programmes for teachers to strengthen their capacity in integrating and facilitating the use of educational technology in classroom instruction, thereby improving students' learning outcomes.

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