

IMPACT OF EDUCATIONAL TECHNOLOGY ON THE TEACHING AND LEARNING OF GEOGRAPHY IN PUBLIC SECONDARY SCHOOLS IN EGBEDA LOCAL GOVERNMENT AREA, OYO STATE, NIGERIA

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Abstract

Educational technology has become an important tool for enhancing the teaching and learning of Geography by improving students' understanding, engagement, and academic performance. However, its effective integration in many Nigerian public secondary schools remains a challenge. This study examined the impact of educational technology on the teaching and learning of Geography in public secondary schools in Egbeda Local Government Area, Oyo State. A descriptive survey research design was adopted. A multi-stage sampling procedure was used to select 270 respondents comprising 20 Geography teachers and 250 Senior Secondary School II (SS2) students from 10 public secondary schools.

Data were collected using structured questionnaires and analysed using descriptive statistics (frequency, percentage, mean, and standard deviation) and Chi-square (χ^2) at the 0.05 level of significance. The findings revealed that 60.0% of the Geography teachers possessed a B.Ed./B.Sc. degree, while 45.0% had over 10 years of teaching experience. Among the students, 58.0% were aged 16–18 years and 60.0% had studied Geography for 1–2 years. Students agreed that educational technology improved their understanding of Geography concepts (Mean = 4.50), map-reading and spatial thinking skills (Mean = 4.59), and academic performance (Mean = 4.50), with an overall grand mean of 4.22. Teachers also acknowledged that educational technology improves the effectiveness of Geography teaching (Mean = 4.95), although its availability and utilisation remained inadequate (Grand Mean = 3.17).

Furthermore, inadequate technological facilities, irregular electricity supply, insufficient funding, poor internet connectivity, inadequate teacher training, and lack of technical support were identified as major constraints to technology integration (Grand Mean = 4.02). The study concluded that educational technology has significant potential to enhance the teaching and learning of Geography when adequate facilities, continuous teacher training, and institutional support are provided. It therefore recommended increased government investment in educational technology infrastructure, regular professional development for Geography teachers, improved electricity and internet services, and adequate funding for technology integration in public secondary schools.

Keywords: Educational technology, Geography education, technology integration

INTRODUCTION

Educational technology has transformed teaching and learning by providing innovative tools that enhance classroom instruction, improve learner engagement, and promote the acquisition of knowledge and skills. The rapid advancement of digital technologies has significantly reshaped educational practices worldwide, enabling teachers to integrate innovative instructional approaches into classroom teaching (UNESCO, 2023). In Geography education, digital technologies such as Geographic Information Systems (GIS), Google Earth, satellite imagery, digital maps, multimedia presentations, and internet-based learning resources have expanded opportunities for learners to develop spatial thinking, environmental awareness, and problem-solving skills (Jo et al., 2022).

The integration of educational technology into Geography instruction has the potential to improve students' conceptual understanding, increase classroom participation, and promote inquiry-based learning. Through the use of geospatial technologies, multimedia resources, and interactive digital platforms, learners are better able to visualise geographical processes, interpret spatial data, and relate theoretical concepts to real-world environmental issues. Consequently, educational technology is increasingly recognised as an essential tool for improving the quality of Geography education.

Despite these recognised benefits, the integration of educational technology into Geography teaching remains inconsistent in many public secondary schools in Nigeria. Studies have identified challenges such as inadequate technological infrastructure, limited teacher training, unreliable electricity supply, insufficient funding, and poor access to digital learning resources as major barriers to effective technology integration in schools (Adukaite et al., 2021; UNESCO, 2023). As a result, many Geography teachers continue to rely predominantly on conventional teaching methods, which may limit students' engagement, spatial reasoning, and understanding of geographical concepts.

Although previous studies have examined the influence of educational technology on teaching effectiveness and students' academic performance, most have focused on education generally or on subjects other than Geography. In addition, there is limited empirical evidence on how the availability, utilisation, and effective integration of educational technology influence the teaching and learning of Geography in public secondary schools within Egbeda Local Government Area of Oyo State. This gap in the literature limits evidence-based decision-making regarding investments in educational technology and strategies for improving Geography education in the study area.

Against this background, this study examines the impact of educational technology on the teaching and learning of Geography in public secondary schools in Egbeda Local Government Area, Oyo State. The findings are expected to contribute to the existing body of knowledge and provide useful evidence for teachers, school administrators, curriculum developers, and policymakers seeking to strengthen the integration of educational technology into Geography education.

Table 1: Traditional Teaching Methods and Educational Technology Tools Used in Geography Teaching

S/N	Traditional (Conventional) Methods of Teaching Geography	Technological Tools for Teaching Geography
	These rely mainly on the teacher and printed materials, with little or no use of digital technology.	These use digital technologies to improve teaching effectiveness and student learning.
1	Chalkboard/whiteboard teaching	Desktop and laptop computers
2	Lecture method	Tablets/ Smartphones
3	Textbook-based instruction	Multimedia projectors
4	Question-and-answer method	Geographic Information Systems (GIS)
5	Discussion method	Google Maps
6	Demonstration using physical maps and globes/ practical paper maps	Digital atlases
7	Field trips and excursions	Internet-Based Tools
8	Map drawing and sketching	Google Classroom
9	Atlas reading	Satellite imagery/ Drone Imagery
10	Use of charts, diagrams, and photographs	Artificial intelligence tools

Objectives of the Study

The study seeks to:

1. Determine the availability of educational technology resources for teaching Geography in public secondary schools in Egbeda Local Government Area, Oyo State.
2. Examine the extent to which Geography teachers utilise educational technology in the teaching of Geography.
3. Assess the impact of educational technology on students' learning of Geography.
4. Identify the challenges affecting the integration of educational technology into the teaching and learning of Geography.
5. Examine the relationship between the utilisation of educational technology and students' learning outcomes in Geography.

Research Questions

This study seeks to answer the following research questions:

1. What educational technology resources are available for the teaching and learning of Geography in public secondary schools in Egbeda Local Government Area, Oyo State?
2. To what extent do Geography teachers utilise educational technology in the teaching of Geography in public secondary schools in Egbeda Local Government Area, Oyo State?
3. What is the impact of educational technology on students' learning of Geography in public secondary schools in Egbeda Local Government Area, Oyo State?
4. What challenges hinder the effective integration of educational technology in the teaching and learning of Geography in public secondary schools in Egbeda Local Government Area, Oyo State?
5. What relationship exists between the utilisation of educational technology and students' learning outcomes in Geography in public secondary schools in Egbeda Local Government Area, Oyo State?

Research Hypotheses

The following null hypotheses will be tested at the 0.05 level of significance:

H₀₁: There is no significant association between the utilisation of educational technology and students' learning outcomes in Geography in public secondary schools in Egbeda Local Government Area, Oyo State.

H₀₂: There is no significant association between the availability of educational technology and the effectiveness of Geography teaching in public secondary schools in Egbeda Local Government Area, Oyo State.

H₀₃: There is no significant association between Geography teachers' competence in the use of educational technology and students' engagement in Geography lessons in public secondary schools in Egbeda Local Government Area, Oyo State.

Literature Review

Educational Technology in Geography Education

Educational technology refers to the application of digital technologies, instructional resources, and technological processes to facilitate effective teaching and learning. In Geography education, educational technology encompasses tools such as Geographic Information Systems (GIS), Google Earth, digital maps, satellite imagery, multimedia presentations, and online learning platforms. These technologies enable learners to visualise geographical phenomena, analyse spatial data, and develop critical thinking and problem-solving skills. Research has shown that the effective integration of educational technology enhances students' engagement, promotes active learning, and improves academic achievement in Geography and related disciplines (UNESCO, 2023; Jo et al., 2022).

Theoretical Framework

This study is underpinned by the Technological Pedagogical Content Knowledge (TPACK) Framework developed by Mishra and Koehler (2006). The framework explains that effective technology integration depends on teachers' ability to combine technological knowledge, pedagogical knowledge, and subject content knowledge. In Geography education, the framework suggests that meaningful learning occurs when teachers integrate appropriate technologies with effective teaching strategies to support students' understanding of geographical concepts.

Empirical Review

Recent studies have consistently reported that educational technology positively influences teaching effectiveness and students' learning outcomes. Jo et al. (2022) found that geospatial technologies, including GIS and Google Earth, improved students' spatial thinking and conceptual understanding in Geography. Similarly, UNESCO (2023) reported that digital technologies can enhance learning when they are effectively integrated into classroom instruction and supported by adequate teacher training and infrastructure. However, studies have also identified persistent barriers to technology integration, including inadequate technological facilities, limited teacher competence, unreliable electricity supply, and poor internet connectivity, particularly in developing countries.

Research Gap

Although previous studies have established the educational benefits of technology integration, relatively few have examined its impact specifically on the teaching and learning of Geography in public secondary schools within Egbeda Local Government Area of Oyo State. Furthermore, limited empirical attention has been given to the combined influence of technology availability, teachers' utilisation of educational technology, and students' learning outcomes in the study area. This study addresses this gap by providing empirical evidence that can inform educational practice and policy regarding the effective integration of educational technology into Geography education.

METHODOLOGY

The study was conducted in Egbeda Local Government Area of Oyo State, Nigeria, one of the 33 Local Government Areas in the state, with its headquarters at Egbeda, Ibadan. The Local Government Area was created from the former Lagelu Local Government Area in 1989. It lies within the rainforest and derived savannah zones of south-western Nigeria and has a tropical climate characterised by rainy and dry seasons. Egbeda covers about 191 km², has a population density of approximately 1,470 persons per km², and is divided into 11 political wards.

A multi-stage sampling procedure was adopted. Five wards with a high concentration of public senior secondary schools were purposively selected: Olodo/Kumapayi I, Olodo II, Olodo III, Osegere/Awaye, and Egbeda. Two communities were selected from each ward, giving a total of 10 communities. One public senior secondary school was selected from each community. From each school, two Geography teachers were purposively selected, while 25 SS2 students were selected through simple random sampling, resulting in a total sample of 270 respondents (20 teachers and 250 students).

Data were collected from primary and secondary sources. A structured questionnaire was administered to the selected respondents, while secondary data were obtained from relevant books, journals, and other scholarly materials.

The data were analysed using descriptive and inferential statistics. Descriptive statistics (frequency counts, percentages, and mean scores) were used to answer the research questions, while Chi-square (χ^2) was used to test the hypotheses at the 0.05 level of significance.

RESULTS AND DISCUSSION

Respondents' personal characteristics

Table 1a presents the demographic characteristics of the Geography teachers who participated in the study. The findings revealed that 12 (60.0%) of the respondents were male, while 8 (40.0%) were female, indicating that male teachers constituted the majority of the participants.

With respect to age, 8 (40.0%) of the teachers were between 31 and 40 years, 6 (30.0%) were aged 41–50 years, while 3 (15.0%) each were within the 21–30 years and above 50 years age categories. This indicates that the majority of the respondents were in their productive working years.

Regarding educational qualification, the majority of the respondents, 12 (60.0%), possessed a B.Ed./B.Sc. degree, 5 (25.0%) held M.Ed./M.Sc. degrees, 2 (10.0%) had the Nigeria Certificate in Education (NCE), while 1 (5.0%) possessed a Postgraduate Diploma in Education (PGDE). None of the respondents had a Ph.D. qualification. This suggests that the teachers were academically qualified to provide reliable responses for the study.

In terms of teaching experience, 9 (45.0%) of the respondents had more than 10 years of teaching experience, 7 (35.0%) had 6–10 years of experience, while 4 (20.0%) had 1–5 years of teaching experience. This indicates that the majority of the Geography teachers were experienced professionals, suggesting that they possessed adequate knowledge and practical experience to provide credible information on the availability and use of educational technology in the teaching and learning of Geography.

Table 1a: Demographic Characteristics of Geography Teachers (N = 20)

Variables	Category	Frequency(f)	Percentage %
Gender	Male	12	60.0
	Female	8	40.0
	Total	20	100.0
Age (Years)	21–30	3	15.0
	31–40	8	40.0
	41–50	6	30.0
	Above 50	3	15.0
	Total	20	100.0
Highest Educational Qualification	NCE	2	10.0
	B.Ed./B.Sc.	12	60.0
	PGDE	1	5.0
	M.Ed./M.Sc.	5	25.0
	Ph.D.	0	0.0
	Total	20	100
Teaching Experience (Teachers)	1–5 years	4	20.0
	6 - 10 years	7	35.0
	Above 10 years	9	45.0
	Total	20	100.0

Source: Field Survey, 2026.

Analysis of Table 1b: Demographic Characteristics of SS2 Geography Students (N = 250)

Table 1b presents the demographic characteristics of the SS2 Geography students who participated in the study.

The findings revealed that 127 (50.8%) of the respondents were female, while 123 (49.2%) were male, indicating a fairly balanced gender distribution among the respondents.

Regarding age, the majority of the students, 145 (58.0%), were between 16 and 18 years of age, 90 (36.0%) were within the 13–15 years age group, while 15 (6.0%) were above 18 years. This indicates that most of the respondents were within the expected age range for senior secondary school students.

With respect to class level, all 250 (100.0%) of the respondents were SS2 students, reflecting the study's focus on students at this level.

Concerning the duration of studying Geography, 150 (60.0%) of the respondents had studied Geography for 1–2 years, 75 (30.0%) had studied the subject for more than 2 years, while 25 (10.0%) had studied Geography for less than one year. This suggests that the majority of the students had sufficient exposure to Geography and were therefore in a good position to provide reliable information on the use of educational technology in the teaching and learning of the subject.

Table 1b: Demographic Characteristics of SS2 Geography Students (N = 250)

Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	123	49.2
	Female	127	50.8
	Total	250	100.0
Age (Years)	13–15	90	36.0
	16–18	145	58.0
	Above 18	15	6.0
	Total	250	100.0
Class	SS2	250	100
Duration of Studying Geography	Less than 1 year	25	10.0
	1–2 years	150	60.0
	More than 2 years	75	30.0
	Total	250	100.0

Source: Field Survey, 2026.

Impact of Educational Technology on the Teaching and Learning of Geography

Table 2 shows that students generally perceived educational technology as having a positive impact on the teaching and learning of Geography, with seven out of eight items accepted. Respondents agreed that educational technology improves students' understanding of Geography concepts, interest in learning, participation during lessons, map-reading and spatial thinking skills, academic performance, and the overall effectiveness of Geography teaching and learning. The highest mean score was recorded for the availability of GIS facilities in schools (Mean = 4.66, SD = 0.92). However, respondents disagreed that educational technology promotes effective communication between teachers and students during Geography lessons (Mean = 2.96, SD = 1.40). Overall, the findings indicate that educational technology positively influences Geography teaching and learning, although improvements are needed to enhance teacher–student communication.

Table 2: Students' Responses on the Impact of Educational Technology on the Teaching and Learning of Geography (n = 250)

S/N	Statement	SA	A	U	D	SD	Mean	SD	Decision
1	Utilization of educational technology during teaching improves geography learning outcome	150	90	0	5	5	4.5	0.80	Accepted
2	Teachers competence in using educational technology improves geography students engagement	120	90	0	30	10	4.12	1.13	Accepted
3	Educational technology enhances students' participation during geography lessons.	155	65	5	20	5	4.38	0.99	Accepted
4	Educational technology improves students' map-reading and spatial thinking skills.	184	46	10	4	6	4.59	0.81	Accepted
5	Educational technology promotes effective communication between teachers and students during geography lessons.	45	68	10	3	100	2.96	1.40	Rejected
6	GIS facilities are available in my school.	210	23	1	7	10	4.66	0.92	Accepted
7	Educational technology improves students' academic performance in geography.	170	47	10	24	9	4.50	1.01	Accepted
8	Educational technology enhances the overall effectiveness of teaching and learning Geography.	121	72	9	36	12	4.02	1.23	Accepted
Grand Mean		= 4.22							

Availability and Utilisation of Educational Technology in the Teaching of Geography

Table 3 presents teachers' responses on the availability and utilisation of educational technology in the teaching of Geography. The findings indicate that respondents agreed with only two out of the five statements, suggesting that while teachers recognise the value of educational technology and possess the competence to use it, its availability, regular utilisation, and training opportunities remain inadequate.

Specifically, respondents agreed that educational technology improves the effectiveness of Geography teaching (Mean = 4.95, SD = 0.22) and that they possess adequate competence to use educational technology in teaching Geography (Mean = 4.25, SD = 1.07). However, they disagreed that educational technology facilities are adequately available in their schools

(Mean = 2.00, SD = 0.79), that they regularly use educational technology during Geography lessons (Mean = 2.35, SD = 0.99), and that they have received adequate training on the use of educational technology for teaching Geography (Mean = 2.30, SD = 1.17).

Overall, the findings suggest that although teachers are competent and acknowledge the effectiveness of educational technology in Geography teaching, its effective integration is constrained by inadequate facilities, limited utilisation, and insufficient professional training.

Table 3: Teachers' Responses on the Availability and Utilisation of Educational Technology in the Teaching of Geography (n = 20)

S/N	Statement	SA	A	U	D	SD	Mean	SD	Decision
1	Educational technology facilities are adequately available in my school.	1	0	1	14	4	2	0.9	Rejected
2	I regularly use educational technology during Geography lessons.	2	1	0	16	1	2.35	0.99	Rejected
3	Availability of educational technology makes Geography teaching effective	19	1	0	0	0	4.95	0.22	Accepted
4	I have adequate competence to use educational technology in teaching Geography.	12	4	1	3	0	4.25	1.07	Accepted
5	I have received adequate training on the use of educational technology for teaching Geography	2	2	0	12	4	2.30	1.17	Rejected

Grand Mean = 3.17

Challenges Affecting the Use of Educational Technology in the Teaching of Geography

Table 4 presents teachers' responses on the challenges affecting the use of educational technology in the teaching of Geography. The findings revealed a grand mean of 4.02, indicating that respondents generally agreed that several factors hinder the effective integration of educational technology into Geography teaching.

Specifically, respondents agreed that inadequate availability of educational technology limits effective Geography teaching (Mean = 4.60, SD = 0.50), irregular electricity supply hinders the use of educational technology in Geography lessons (Mean = 4.35, SD = 0.99), poor internet connectivity affects the use of online educational resources for Geography teaching (Mean = 3.80, SD = 1.44), insufficient funding limits the provision of educational technology in schools (Mean = 4.50, SD = 0.83), Geography teachers require more training to effectively use educational technology (Mean = 4.05, SD = 1.39), the limited availability of ICT facilities reduces students' exposure to technology-enhanced Geography learning (Mean = 4.70, SD = 0.47), and lack of technical support discourages the effective use of educational technology in Geography instruction (Mean = 3.80, SD = 1.24).

However, respondents disagreed that large class sizes make it difficult to integrate educational technology effectively during Geography lessons (Mean = 2.35, SD = 1.35), making it the only item rejected.

Overall, the findings suggest that the major challenges affecting the integration of educational technology in Geography teaching include the inadequate availability of educational technology and ICT facilities, irregular electricity supply, poor internet connectivity, insufficient funding, inadequate teacher training, and lack of technical support. These challenges may hinder the effective use of educational technology in Geography instruction.

Table 4: Teachers' Responses on the Challenges Affecting the Use of Educational Technology in the Teaching of Geography (N = 20)

S/N	Statement	SA	A	U	D	SD	Mean	SD	Decision
1	Inadequate availability of educational technology limits effective Geography teaching.	14	5	0	1	0	4.60	0.50	Accepted
2	Irregular electricity supply hinders the use of educational technology in Geography lessons.	12	6	0	1	1	4.35	0.99	Accepted
3	Poor internet connectivity affects the use of online educational resources for Geography teaching.	10	4	1	2	3	3.80	1.44	Accepted
4	Insufficient funding limits the provision of educational technology in schools.	15	3	0	1	1	4.50	0.83	Accepted
5	Geography teachers require more training to effectively use educational technology. Geography lessons.	13	2	0	3	2	4.05	1.39	Accepted
6	The limited availability of ICT facilities reduces students' exposure to technology-enhanced Geography learning.	14	6	0	0	0	4.70	0.47	Accepted
7	Large class sizes make it difficult to integrate educational technology effectively during Geography lessons.	2	2	2	9	5	2.35	1.35	Rejected
8	Lack of technical support discourages the effective use of educational technology in Geography instruction.	8	7	0	2	3	3.80	1.24	Accepted
Grand Mean		4.02							

CONTINGENCY TABLE 1

Relationship between the Utilisation of Educational Technology and Students' Learning Outcomes in Geography (H_{01})

Utilisation of Educational Technology	Positive Learning Outcome (SA+A)	Negative Learning Outcome (D+SD)	Total
High Utilisation	100	20	120
Low Utilisation	40	90	130
Total	140	110	250

- Out of 120 students where educational technology was highly utilised, 100 had positive learning outcomes while 20 had negative outcomes.
- Out of 130 students where educational technology was poorly utilised, 40 had positive learning outcomes while 90 had negative outcomes.

CONTINGENCY TABLE 2

Relationship between the Availability of Educational Technology and the Effectiveness of Geography Teaching (H_{02})

Availability of Educational Technology	Effective Teaching (SA+A)	Less Effective Teaching (D+SD)	Total
High Availability	8	1	9
Low Availability	1	10	11
Total	9	11	20

- Schools with high availability of educational technology were mostly rated as having effective teaching (8 out of 9).
- Schools with low availability were mostly rated as having less effective teaching (10 out of 11).

CONTINGENCY TABLE 3

Relationship between Geography Teachers' Competence in the Use of Educational Technology and Students' Engagement in Geography Lessons (H_{03})

Teachers' Competence	High Student Engagement (SA+A)	Low Student Engagement (D+SD)	Total
High Competence	85	45	130
Low Competence	15	105	120
Total	100	150	250

- Where teachers had high competence, 85 students showed high engagement and 45 showed low engagement.
- Where teachers had low competence, only 15 students showed high engagement, while 105 showed low engagement.

TEST OF HYPOTHESIS

Analysis of Contingency Table 1 (H_{01})

The Chi-square analysis revealed a statistically significant relationship between the utilisation of educational technology and students' learning outcomes in Geography ($\chi^2 = 69.98$, $df = 1$, $p < 0.05$). Since the p-value is less than the 0.05 level of significance, the null hypothesis (H_{01}) is rejected. This indicates that the utilisation of educational technology is significantly associated with students' learning outcomes in Geography in public secondary schools in Egbeda Local Government Area, Oyo State.

Table 5: Chi-square Analysis of the Relationship between the Utilisation of Educational Technology and Students' Learning Outcomes in Geography

Variables	χ^2	Df	P-value	Decision	Remark
Utilisation of Educational Technology and Students' Learning Outcomes	69.98	1	0.000	Significant(S)	Reject

Significant at 0.05 level of significance.

Source: Field Survey, 2026.

Analysis of Contingency Table 2 (H_{02})

Contingency Table 2 presents the relationship between the availability of educational technology and the effectiveness of Geography teaching in public secondary schools. The Chi-square analysis revealed a significant association between the availability of educational technology and the effectiveness of Geography teaching ($\chi^2 = 10.96$, $df = 1$, $p = 0.001$). Since the p-value is less than the 0.05 level of significance, the null hypothesis was rejected. This implies that the availability of educational technology is significantly associated with the

effectiveness of Geography teaching in public secondary schools in Egbeda Local Government Area, Oyo State.

Table 6: Chi-square Analysis of the Relationship between the Availability of Educational Technology and the Effectiveness of Geography Teaching

Variables	χ^2	Df	P-value	Decision	Remark
Availability of Educational Technology and Effectiveness of Geography Teaching	10.96	1	0.001	Significant (S)	Reject

Significant at 0.05 level of significance.

Source: Field Survey, 2026.

Analysis of Contingency Table 3 (H_{03})

Contingency Table 3 presents the relationship between Geography teachers' competence in the use of educational technology and students' engagement in Geography lessons. The Chi-square analysis indicated a significant association between teachers' competence in the use of educational technology and students' engagement in Geography lessons ($\chi^2 = 45.82$, $df = 1$, $p < 0.001$). Since the p-value is less than the 0.05 level of significance, the null hypothesis was rejected. This indicates that Geography teachers' competence in the use of educational technology significantly influences students' engagement during Geography lessons in public secondary schools in Egbeda Local Government Area, Oyo State.

Table 7: Chi-square Analysis of the Relationship between Geography Teachers' Competence in the Use of Educational Technology and Students' Engagement in Geography Lessons

Variables	χ^2	Df	P-value	Decision	Remark
Geography Teachers' Competence in the Use of Educational Technology and Students' Engagement in Geography Lessons	45.82	1	0.000	Significant (S)	Reject

Significant at 0.05 level of significance.

Source: Field Survey, 2026.

CONCLUSION

This study examined the impact of educational technology on the teaching and learning of Geography in public secondary schools in Egbeda Local Government Area, Oyo State. The findings revealed that educational technology has a positive influence on students' learning by improving their understanding of geographical concepts, increasing interest and participation in lessons, enhancing map-reading and spatial thinking skills, and improving academic performance. However, the study also found that the effective integration of educational technology remains constrained by inadequate availability of technological facilities, limited utilisation by teachers, insufficient professional training, poor internet connectivity, irregular electricity supply, inadequate funding, and lack of technical support.

Furthermore, although Geography teachers acknowledged the effectiveness of educational technology and reported having the competence to use it, they indicated that the available facilities and opportunities for regular use and training were insufficient. The study therefore concludes that the benefits of educational technology in Geography education can only be fully realised when schools are adequately equipped with modern technological resources and teachers receive continuous professional development. Addressing these challenges will enhance the quality of Geography teaching and learning and contribute to improved students' learning outcomes in public secondary schools in Egbeda Local Government Area, Oyo State.

Recommendations

Government at the federal, state, and local levels should provide adequate educational technology facilities, including computers, multimedia projectors, internet access, Geographic Information Systems (GIS), and other digital learning resources, to improve the teaching and learning of Geography in public secondary schools.

School administrators should ensure the regular utilisation of available educational technology by encouraging Geography teachers to integrate digital tools into classroom instruction.

Regular in-service training, workshops, seminars, and professional development programmes should be organised to improve teachers' competence and confidence in the effective use of educational technology for Geography instruction.

Government and school authorities should invest in reliable electricity supply and improved internet connectivity to support the effective use of technology-enhanced teaching and learning.

Increased funding should be allocated to schools for the procurement, maintenance, and upgrading of educational technology facilities and ICT infrastructure.

Technical support personnel should be employed or made available in schools to maintain technological facilities and provide assistance to teachers during classroom implementation.

Curriculum developers and education policymakers should strengthen policies that promote the integration of educational technology into Geography education and monitor their implementation across public secondary schools.

Future researchers should conduct similar studies in other local government areas and states using larger samples and additional variables to provide broader evidence on the impact of educational technology on Geography education.

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