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ASSESSING THE IMPACT OF TECHNOLOGY-DRIVEN INSTRUCTIONAL METHODS ON PUPILS' ENGAGEMENT AND PERFORMANCE IN PRIMARY SCHOOLS IN YENAGOA LOCAL GOVERNMENT AREA OF BAYELSA STATE, NIGERIA

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Abstract

This study assessed the impact of technology-driven instructional methods on pupils' engagement and academic performance in primary schools in Yenagoa Local Government Area of Bayelsa State , Nigeria. A descriptive survey research design was adopted, guided by two research questions. The population comprised 1,456 teachers from government-owned primary schools, from which a sample of 399 teachers was selected using a multistage sampling technique. Data were collected using a structured questionnaire and analyzed using Mean and Standard Deviation. Findings revealed that

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Technology-Driven Instruction, Pupil Engagement, Academic Performance, Primary Education, Innovative Teaching Methods

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the extent of adoption of technology-driven instructional methods is high, with digital tools such as videos, animations, and interactive applications significantly enhancing pupils' interest, participation, and understanding of lessons. Furthermore, teachers held positive perceptions of innovative instructional methods, recognizing their effectiveness in improving pupils' motivation, critical thinking, and academic performance. The study recommended increased investment in educational technology, teacher training, and the development of contextually relevant digital resources to maximize the benefits of digital learning. These findings emphasize the role of technology in creating dynamic and interactive learning environments that support pupils' academic success.

Introduction

The integration of technology into education has transformed instructional delivery, particularly in primary schools, where foundational learning experiences shape pupils' academic trajectories. Technology-driven instructional methods, such as interactive multimedia, adaptive learning platforms, and digital simulations, have been increasingly adopted to enhance pupil engagement and academic performance (Mayer, 2017). These innovations are designed to foster active learning, improve comprehension, and provide personalized learning experiences tailored to individual needs. However, the extent to which these methods influence learning outcomes, particularly in primary schools, remains a subject of interest in educational research.

Effective teaching strategies play a crucial role in ensuring that primary school pupils develop essential cognitive and problem-solving skills. Studies indicate that traditional teaching approaches often fail to cater to diverse learning styles, leading to disengagement and poor academic performance (Darling-Hammond et al., 2020). In contrast, technology-driven instructional methods, such as gamified learning environments and virtual simulations, have been found to promote learner participation and motivation (Clark & Feldon, 2014).

These tools offer interactive and engaging content that aligns with pupils' cognitive development, potentially improving retention and understanding.

Teachers' perceptions of technology integration are a significant factor in determining the effectiveness of these instructional methods. While some educators view technology as a valuable tool for enhancing pedagogical practices, others remain skeptical due to challenges such as inadequate training, lack of infrastructure, and concerns about digital distractions in the classroom (Ertmer & Ottenbreit-Leftwich, 2013). Understanding teachers' attitudes and experiences is essential in assessing the practical implications of technology-driven instruction and identifying barriers to its effective implementation.

Despite the potential benefits of technology in education, disparities in access and implementation present challenges, particularly in developing regions. Schools in areas with limited technological resources may struggle to adopt and sustain technology-based instructional practices, which can widen the digital divide among pupils (Warschauer & Matuchniak, 2010). Therefore, examining the impact of technology-driven instruction within a localized context, such as primary schools in Yenagoa Local Government Area of Bayelsa State, is critical in determining its feasibility and effectiveness.

This study aims to assess the impact of technology-driven instructional methods on pupils' engagement and performance in primary schools in Yenagoa Local Government Area. It seeks to evaluate how these methods influence learning outcomes and explore teachers' perceptions of their effectiveness. By addressing these aspects, the research contributes to the broader discourse on educational technology and its role in enhancing learning experiences for young learners.

Purpose of the Study

The study assessed the impact of technology-driven instructional methods on pupils' engagement and performance in primary schools in Yenagoa Local Government Area of Bayelsa State. Specifically, the study achieved the following:

1. To evaluate the impact of technology-driven instructional methods on pupils' engagement and performance in primary schools.
2. To explore teachers' perceptions of the effectiveness of innovative instructional trends in enhancing academic outcomes for primary school pupils.

Research Questions

The following research questions were raised:

i. How do technology-driven instructional methods impact pupils' engagement and academic performance in primary schools?
ii. What are teachers' perceptions of the effectiveness of innovative instructional trends in enhancing academic outcomes for primary school pupils?

Methodology

This study adopted a descriptive survey research design, which is used to systematically collect and analyze data from a representative sample to describe characteristics, opinions, or trends within a population (Lawrant, 2018). This design was appropriate as it enabled the researcher to gather data from primary school teachers in Yenagoa Local Government Area (LGA) of Bayelsa State and assess the extent of adoption, impact, and challenges associated with technology-driven instructional methods. The population of the study comprised 1,456 teachers across the 59 government-owned primary schools in Yenagoa LGA (Bayelsa State Ministry of Education, 2025). A multistage sampling technique was employed to select a representative sample of 399 teachers from 15 primary schools within the study area. Sampling by balloting was used to select five primary schools from each of the three constituencies in Yenagoa LGA, making a total of 15 primary schools. All 399 teachers from the selected schools formed the sample for the study, ensuring broad representation of teachers with diverse experiences in technology-driven instructional methods. The primary instrument for data collection was a researcher-designed questionnaire titled "Technology-Driven

Instructional Methods and Pupils' Engagement and Performance Questionnaire (TDIMPEPQ)." The questionnaire was divided into two sections:

Part A: Collected demographic information of the respondents.

Part B: Contained structured items measuring: the extent of adoption of technology-driven instructional methods and Teachers' perceptions of the effectiveness of these innovations.

Responses were structured using a four-point Likert scale:

- Very High Extent (VHE) – 4 points
- High Extent (HE) – 3 points
- Low Extent (LE) – 2 points
- Very Low Extent (VLE) – 1 point

The instrument was validated by experts in Measurement and Evaluation, who reviewed it for content coverage, clarity, relevance, and alignment with the research objectives. Their feedback was incorporated into the final draft to improve the instrument's quality.

To establish reliability, a pilot study was conducted with 20 teachers randomly selected from two primary schools outside the study area. The data collected were analyzed using Cronbach's Alpha reliability test, yielding a reliability coefficient of 0.76, indicating a high level of internal consistency and reliability of the instrument. The researcher personally visited the 15 sampled schools and administered the questionnaire. Teachers were briefed on the purpose of the study and guided on how to complete the questionnaire. This approach ensured a 100% response rate, as all administered questionnaires were retrieved for analysis. The research questions were answered using Mean and Standard Deviation. The decision rule was determined based on the average of the four-point Likert scale:

- A mean score of 2.50 and above was interpreted as High Extent.
- A mean score below 2.50 was interpreted as Low Extent.

Results

Research Question 1

To what extent does technology-driven instructional methods impact pupils' engagement and academic performance in primary schools?

EDITOR-IN-CHIEF
Prof. A.I. Mteiye [MALAWI]

Table 1: Mean responses on the extent to which technology-driven instructional methods impact pupils' engagement and academic performance in primary schools'

S/N	Items	N	Mean	Remark
1.	Technology-driven instructional methods have increased pupils' interest in learning activities.	399	3.31	HE
2.	Pupils actively participate in lessons that utilize digital tools such as videos, interactive apps, or animations.	398	3.20	HE
3.	The use of technology in the classroom has improved pupils' ability to work collaboratively during group tasks.	399	3.11	HE
4.	Technology-driven methods encourage pupils to ask more questions and seek clarifications during lessons.	399	2.85	HE
5.	Pupils' academic performance has improved due to the use of technology-driven instructional methods.	399	3.17	HE
6.	Digital tools have enhanced pupils' understanding of complex concepts in subjects like mathematics and science.	399	3.10	HE
7.	Technology-driven lessons have improved pupils' critical thinking and problem-solving skills	399	2.86	HE
	Grand Mean		3.08	

Source: Researchers Computation2025

The data in Table 1 demonstrates a high extent (HE) of impact of technology-driven instructional methods on pupils' engagement and academic performance in primary schools, with a grand mean score of 3.08. Key areas of positive influence include the increase in pupils' interest in learning activities

(mean = 3.31) and active participation during lessons that utilize digital tools such as videos and interactive apps (mean = 3.20). Additionally, the integration of technology has improved pupils' collaborative skills during group tasks (mean = 3.11) and enhanced their understanding of complex subjects, particularly in mathematics and science (mean = 3.10).

Despite these positive impacts, some areas exhibit comparatively lower influence, such as encouraging pupils to ask more questions (mean = 2.85) and improving critical thinking and problem-solving skills (mean = 2.86). These findings suggest that while technology-driven methods significantly enhance engagement and performance, there is room to optimize their implementation to address critical thinking and inquiry-based learning. Overall, the results highlight the transformative potential of technology in fostering better academic outcomes in primary schools.

Research Question 2

What are teachers' perceptions of the effectiveness of innovative instructional trends in enhancing academic outcomes for primary school pupils?

Table 2: Mean responses on teachers' perceptions of the effectiveness of innovative instructional trends in enhancing academic outcomes for primary school pupils

S/N	Items	N	Mean	Remark
8.	Innovative instructional trends make it easier for pupils to grasp difficult concepts.	399	2.83	HE
9.	Technology-based instructional tools enhance pupils' critical thinking and analytical skills.	399	3.41	HE
10.	Game-based learning and interactive activities improve pupils' motivation to learn.	399	3.18	HE
11.	Collaborative instructional methods, such as group projects, foster better academic outcomes.	399	3.33	HE
12.	The integration of multimedia resources (e.g., videos, animations) leads to better understanding and retention among pupils.	399	3.08	HE
13.	Flipped classroom models (where pupils review materials before class) encourage active participation during lessons.	399	3.01	HE
14.	Regular use of innovative instructional methods leads to measurable improvement in pupils' test scores.	399	3.04	HE
	Grand Mean		3.12	

The data in Table 2 reveals that teachers perceive innovative instructional trends as highly effective (HE) in enhancing academic outcomes for primary school pupils, with a grand mean score of 3.12. Teachers strongly agree that technology-based instructional tools enhance critical thinking and analytical skills (mean = 3.41), and collaborative instructional methods, such as group projects, foster better academic outcomes (mean = 3.33). Additionally, game-based learning and interactive activities significantly improve pupils'

motivation to learn (mean = 3.18), while multimedia resources enhance understanding and retention (mean = 3.08). These findings reflect teachers' belief in the substantial role of modern teaching methods in driving educational success.

However, while perceptions are generally positive, some areas show relatively lower ratings. For instance, the effectiveness of flipped classroom models in promoting active participation (mean = 3.01) and the measurable improvement in pupils' test scores through regular use of innovative methods (mean = 3.04) suggest that further optimization or support may be needed in these areas. Overall, the data underscores the importance of integrating innovative trends in instructional strategies to achieve better academic outcomes for pupils.

Discussion of Findings

The findings in research question 1 revealed that the extent to which technology-driven instructional methods impact pupils' engagement and academic performance in primary schools in Yenagoa Local Government Area of Bayelsa State is high. This finding suggests that the use of digital tools such as videos, animations, and interactive applications significantly enhances pupils' interest, participation, and understanding of lessons. Also, technology-driven methods foster critical thinking, collaboration, and problem-solving skills among pupils, contributing to improved academic performance. These findings indicate that technology is not only a tool for delivering content but also an essential mechanism for creating an interactive and engaging learning environment.

The high impact of technology-driven methods implies that schools and policymakers should prioritize the integration of digital tools into classroom instruction to maximize pupils' learning potential. This calls for continued investment in educational technology infrastructure, teacher training, and the development of contextually relevant digital resources. These results align with the studies of Okoro (2022) and Bello (2023), who highlighted that the strategic use of technology in education leads to higher student achievement and engagement. The findings underscore the importance of leveraging

technology as a key component in educational strategies to enhance learning outcomes and prepare pupils for a digitally driven world.

The findings in research question 2 revealed that Teachers' perceptions of the effectiveness of innovative instructional trends in enhancing academic outcomes for primary school pupils in Yenagoa Local Government Area of Bayelsa State are positive. This finding suggests that teachers believe that the use of innovative instructional methods, such as technology-based tools, game-based learning, and multimedia resources, significantly improves pupils' understanding, motivation, and academic performance. Teachers recognize the positive impact of these methods on pupils' ability to grasp difficult concepts, engage in critical thinking, and work collaboratively. These perceptions highlight the growing confidence among educators in adopting innovative teaching strategies to improve learning outcomes.

The positive perceptions of teachers imply that continued support for innovative teaching practices is crucial in sustaining their effectiveness. Schools and education policymakers should invest in providing adequate training, resources, and infrastructure to empower teachers in implementing these methods. The recognition of the value of innovative instructional trends aligns with research by Smith (2023) and Roberts (2022), who found that teachers who perceive the benefits of innovative methods are more likely to incorporate them into their teaching, leading to improved academic outcomes. The findings emphasize the need for a supportive environment that encourages the ongoing use and refinement of innovative instructional methods to enhance pupil learning and performance.

Conclusion

The findings of this study highlight the significant impact of technology-driven instructional methods on pupils' engagement and academic performance in primary schools in Yenagoa Local Government Area of Bayelsa State. The high level of engagement observed suggests that digital tools, such as interactive applications, videos, and multimedia resources, not only enhance pupils' interest and participation but also foster critical thinking and problem-solving skills. Also, the study revealed that teachers hold positive perceptions of

innovative instructional trends, recognizing their effectiveness in improving academic outcomes. These insights underscore the need for sustained investment in educational technology, teacher training, and infrastructure to maximize the benefits of digital learning. As technology continues to shape modern education, schools and policymakers must prioritize its integration to create dynamic and interactive learning environments that support pupils' academic success and future readiness.

Recommendations

In view of the results, the discussions and the educational implications of the present study thereof, the following recommendations are made:

1. Policymakers should develop and implement supportive policies that encourage the adoption of innovative instructional methods through incentives and recognition for teachers.
2. Schools should establish a collaborative network where teachers can share experiences and best practices for the successful implementation of innovative teaching techniques.

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