**CHAPTER FOUR**

**RESULTS**

The results of the study are presented in accordance with the research questions and hypotheses. Descriptive statistics, particularly mean scores derived from Likert-scale responses, are used to address each research question. The findings are organized and discussed in alignment with the structure of the research questions.

**4.1 Answers to the Research Questions**

**4.1.1 Research Question 1**

To what extent are technological resources available and accessible in senior secondary schools in Edo South Senatorial District?

To address this research question, items Q1 to Q6 were analyzed. These items focused on the presence of technological tools, the level of access provided to both teachers and students, equity in access, and internet connectivity across schools.

Table 1

|  |  |  |
| --- | --- | --- |
| **Item No** | **Statement** | **Mean Score** |
| Q1 | Technological resources are available in my school | 2.67 |
| Q2 | Students and teachers have adequate access to technology | 2.84 |
| Q3 | Measures are in place to ensure equal access to technology | 2.88 |
| Q4 | The school provides a stable internet connection | 2.91 |
| Q5 | There is a gap in tech availability between public and private schools | 2.03 |
| Q6 | Technological access is fairly distributed across departments | 2.68 |

**Interpretation:**  
From table 1, the mean scores for items Q1 through Q6 generally fall between 2.67 and 2.91. These scores indicate a moderately negative perception among respondents regarding the availability and accessibility of technological resources. Specifically, Q1 (M = 2.67) and Q2 (M = 2.84) suggest that both the presence and access to educational technology are not strongly established across most schools.

The perception that equal access measures are not significantly enforced (Q3, M = 2.88) and the inadequacy of internet connectivity (Q4, M = 2.91) are notable, as internet access is a foundational requirement for meaningful integration of digital tools. Particularly telling is Q5, which received a mean score of 2.03, indicating that respondents generally agreed there is a noticeable disparity in access between public and private schools, with public schools likely having fewer resources.

This set of responses suggests that while some technological resources may be present, they are not widespread or reliably accessible, which aligns with existing research highlighting the infrastructural and resource-based limitations of many Nigerian schools (Obi & Okoro, 2020).

**4.1.2 Research Question 2**

How prepared and what are the attitudes of teachers towards using technology in their teaching practices in these schools?

Items Q7 to Q11 provided insights into teachers' readiness, comfort, frequency of use, and perceived student engagement when using technology.

|  |  |  |
| --- | --- | --- |
| **Item No** | **Statement** | **Mean Score** |
| Q7 | Teachers have received formal training | 2.36 |
| Q8 | Teachers are comfortable using technology | 2.02 |
| Q9 | Teachers integrate digital tools in lessons | 2.84 |
| Q10 | Training is a major barrier to tech use | 2.10 |
| Q11 | Students are more engaged with tech-integrated lessons | 1.80 |

Table 2

**Interpretation:**  
These scores from table 2 reflects a generally low level of preparedness and confidence among teachers in using technology. For example, Q7 (M = 2.36) and Q8 (M = 2.02) indicate that most respondents disagreed or remained neutral about having received adequate training or feeling comfortable with using tech tools.

The very low score for Q11 (M = 1.80) is particularly revealing—it shows that teachers do not perceive a significant increase in student engagement resulting from technology use, possibly due to ineffective implementation or insufficient resources. Similarly, the response to Q10 (M = 2.10) indicates that a lack of training is a perceived barrier to adoption.

These findings highlight a critical gap in professional development and digital literacy among educators, echoing Ertmer et al.'s (2012) position that teacher beliefs and capabilities play a vital role in successful technology integration.

**4.1.3 Research Question 3**

What impact does technology have on student engagement and learning outcomes in these schools?

This research question was addressed using Q12 to Q17, which examined the perceived effects of technology on student participation, academic performance, learning preferences, and subject-specific gains.

|  |  |  |
| --- | --- | --- |
| **Item No** | **Statement** | **Mean Score** |
| Q12 | Technology improves class participation | 1.78 |
| Q13 | Students use technology to enhance subject understanding | 1.82 |
| Q14 | Tech use has improved student performance | 2.63 |
| Q15 | Students prefer tech-assisted over traditional learning | 2.95 |
| Q16 | Specific subjects are impacted more positively by tech | 2.63 |
| Q17 | Students face major challenges using technology | 2.99 |

Table 3

**Interpretation:**  
Responses to this set of items as shown in table 3 reveals limited positive impact of technology on student engagement and outcomes. Items Q12 and Q13 scored below 2.0, suggesting that teachers and administrators generally disagree that technology significantly improves participation or understanding.

Although Q15 (M = 2.95) suggests that students are slightly more inclined toward tech-assisted learning, the marginal difference indicates that traditional methods still hold sway. Q17 (M = 2.99) points to the existence of significant challenges in students' use of technology, such as poor infrastructure, lack of devices, or limited digital literacy.

In summary, the respondents largely perceive the impact of technology on student performance and engagement as minimal or inconsistent, likely due to the limited resources and weak implementation strategies in schools.

**4.1.4 Research Question 4**

What challenges do schools face in integrating technology into the educational process?

To assess the obstacles hindering technology adoption, responses to Q18 to Q25 were analyzed.

Table 4

|  |  |  |
| --- | --- | --- |
| **Item No** | **Statement** | **Mean Score** |
| Q18 | Financial, infrastructure, and admin challenges exist | 2.98 |
| Q19 | The school lacks a stable internet connection | 2.88 |
| Q20 | The school rarely updates tech infrastructure | 2.54 |
| Q21 | Support is available when facing technical difficulties | 2.84 |
| Q22 | School policies support tech integration | 2.67 |
| Q23 | Clear strategies for promoting tech are in place | 2.69 |
| Q24 | The school evaluates tech’s impact on academics | 2.67 |
| Q25 | There is a plan for expanding tech adoption in the future | 2.95 |

**Interpretation:**  
The responses in table 4 shows that respondents acknowledge the existence of systemic challenges, with mean scores clustering around 2.5 to 2.9. These include infrastructure, financial constraints, and lack of clear strategies. For example, Q18 (M = 2.98) indicates general agreement that there are serious institutional challenges, while Q19 and Q20 (M = 2.88 and 2.54, respectively) suggest that schools often struggle with connectivity and outdated equipment.

While Q25 (M = 2.95) shows that respondents are somewhat hopeful about future plans for technology expansion, the overall trend indicates that current policies and support systems are insufficient to overcome the barriers to effective tech integration.

**4.2 Testing of Hypotheses**

In this section, the hypotheses formulated in Chapter One were tested using inferential statistical techniques. Independent samples t-tests were conducted to compare responses between public and private school respondents with respect to the research variables. The results are presented below.

**2.1 Hypothesis 1**

**Null Hypothesis (H0):** There is no significant difference in the availability and accessibility of technological resources among senior secondary schools in Edo South Senatorial District.

**Tested Items:** Q1 to Q6 (Availability & Accessibility of Technology)  
**Groups Compared:** Public vs Private Schools  
**Statistical Test:** Independent Samples t-test  
**Significance Level:** 0.05

Table 5

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Description** | **t-Statistic** | **p-Value** | **Decision** |
| Q1 | Technological resources are available | -2.245 | 0.0281 | Reject H0 |
| Q2 | Adequate access to technology | -1.084 | 0.282 | Fail to reject H0 |
| Q3 | Equal access to technology ensured | -3.216 | 0.0023 | Reject H0 |
| Q4 | Stable internet connection is available | -0.528 | 0.5991 | Fail to reject H0 |
| Q5 | There is a gap in tech availability between public and private schools | -0.125 | 0.9008 | Fail to reject H0 |
| Q6 | Tech access is fairly distributed across departments | -0.876 | 0.3852 | Fail to reject H0 |

**Interpretation:**  
Out of the six items tested, Q1 and Q3 showed statistically significant differences (p < 0.05), indicating that public and private schools differ notably in the availability of technological resources and the fairness of access. For the other four items, the differences were not statistically significant, meaning there is no sufficient evidence to conclude that access and distribution of technology differ between the two types of schools across those areas.

**Conclusion:**  
Since some items (Q1, Q3) show significant differences, we partially reject the null hypothesis. This suggests that while there is some uniformity in certain aspects of access, there are important disparities in availability and equity of technological resources between public and private schools.

**4.2.2 Hypothesis 2**

**Null Hypothesis (H0):**There is no significant relationship between teacher preparedness/attitudes and the use of technology in teaching practices in these schools.

Table 6T-test Results Comparing Teachers and Non-Teachers on Preparedness and Attitudes Toward Technology

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Description** | **t-Statistic** | **p-Value** | **Decision** |
| Q7 | Formal training received | 1.146 | 0.2621 | Fail to reject H0 |
| Q8 | Comfort level with using technology | -0.095 | 0.9248 | Fail to reject H0 |
| Q9 | Integration of digital tools | 1.105 | 0.2796 | Fail to reject H0 |
| Q10 | Lack of training is a major barrier | 1.138 | 0.2664 | Fail to reject H0 |
| Q11 | Student engagement with technology | -0.217 | 0.8295 | Fail to reject H0 |

**Interpretation:**Although teachers reported slightly higher scores in training (Q7) and integration of digital tools (Q9), none of the differences were statistically significant at the 0.05 level. This suggests a general consensus across respondents (both teachers and non-teachers), regarding the limited training, confidence and integration of technology in classroom practice.

**Conclusion:**We fail to reject the null hypothesis (H0). The findings show no significant relationship between teacher preparedness/attitudes and the use of technology, indicating that improving technology adoption will require not just addressing teacher perspectives, but also institutional training policies and hands-on implementation strategies.

**4.2.3 Hypothesis 3**

**Null Hypothesis (H0):** There is no significant impact of technology on student engagement and learning outcomes in senior secondary schools in Edo South Senatorial District.

**Table 7**  
Summary of Mean Scores for Perceived Impact of Technology on Student Engagement

|  |  |  |  |
| --- | --- | --- | --- |
| **Question** | **Description** | **Mean Score** | **Decision** |
| Q12 | Technology improves class participation | 1.78 | Fail to reject H0 |
| Q13 | Students use technology to enhance understanding | 1.82 | Fail to reject H0 |
| Q14 | Tech use has improved student performance | 2.63 | Fail to reject H0 |
| Q15 | Students prefer tech-assisted over traditional | 2.95 | Fail to reject H0 |
| Q16 | Certain subjects are more positively impacted | 2.63 | Fail to reject H0 |
| Q17 | Students face major challenges using technology | 2.99 | Fail to reject H0 |

**Interpretation:**The mean scores show that respondents largely disagreed or were neutral about technology significantly improving student engagement or academic outcomes. Items Q12 and Q13 had especially low scores (1.78 and 1.82), pointing to skepticism about technology’s effect on participation and comprehension. Q14 and Q16 indicated that while some improvement is perceived in academic performance, the impact is not strong. Q17 shows that student challenges persist, potentially hindering the effectiveness of technology.

**Conclusion:**We fail to reject the null hypothesis (H0). The evidence suggests that technology has not had a clearly positive impact on student engagement or learning outcomes in the surveyed schools. Further investment in training, infrastructure, and digital literacy may be necessary to realize the intended benefits of technology in the classroom.

**4.2.4 Hypothesis 4**

**Null Hypothesis (H0):** There are no significant challenges faced by schools in integrating technology into the educational process.

This hypothesis was tested by analyzing responses to Questions Q18 to Q25, which focused on identifying the financial, infrastructural, administrative, and policy-related challenges involved in the integration of technology into teaching and learning processes.

**Tested Variables (Q18 to Q25):**

* Q18: Financial, infrastructure, and admin challenges exist.
* Q19: The school lacks a stable internet connection.
* Q20: The school rarely updates tech infrastructure.
* Q21: Support is available when facing technical difficulties.
* Q22: School policies support tech integration.
* Q23: Clear strategies for promoting tech are in place.
* Q24: The school evaluates tech’s impact on academics.
* Q25: There is a plan for expanding tech adoption in the future.

To test this hypothesis, an independent samples t-test was intended to compare responses between school types. However, due to constraints in data structure and the complexity of diverse challenge types, a descriptive summary from Section 4.1 was relied upon for interpretation.

**Interpretation:**

From the descriptive statistics already presented, responses to these items mostly hovered around the neutral point (mean scores ranging from approximately 2.54 to 2.99). These scores suggest that while respondents acknowledge that challenges exist, there is no strong consensus regarding their severity or whether schools have implemented sufficient strategies to address them.

The items addressing infrastructure (Q18, Q19) showed relatively higher agreement about the existence of financial and internet-related constraints, whereas questions addressing strategic planning and policy (Q22–Q25) received more neutral or slightly positive responses, indicating uncertainty or inconsistency in implementation across schools.

**Conclusion:**

Given that no significant differences were testable and that the descriptive results lean toward mild agreement or neutrality, we fail to reject the null hypothesis (H0). However, the findings underscore the need for improved infrastructural development, clearer policies, and strategic implementation to support technology integration in education.

**4.3 Summary of the Findings**

The following are the major findings derived from the analysis of data in this study:

* Technological resources such as computers, projectors, and internet facilities are not adequately available and accessible in many Senior secondary schools within Edo South Senatorial District. There is also a significant gap in technology assessment between public and private schools.
* Teachers in the study areas have limited formal training and preparedness for integrating technology in the classroom. Their comfort level with technology and frequency of digital tool usage remain relatively low, with no statistically significant difference when compared with non-teacher respondents.
* The perceived impact of technology on student engagement and learning outcomes is relatively minimal. Respondents generally disagreed or remained neutral regarding improvements in student participation, comprehension, or performance as a result of technology use.
* Numerous challenges hinder effective technology integration in schools. These include financial constraints, unstable internet connections, insufficient support systems, and lack of strategic implementation policies. Respondents confirmed the presence of these challenges but varied in how severe or well-addressed they believed these issues to be.

These findings point to the need for strategic investment in infrastructure, teacher capacity building, and policy frameworks that support equitable access to and effective use of educational technology in the school system.

**References**

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2. Obi, P., & Okoro, E. (2020). *Barriers to technology integration in Nigerian secondary schools: A case study of Edo South Senatorial District. African Journal of Education*, 24(4), 89–104.