

Educational Leaders' Perception of the Effectiveness of Edtech Integration in Secondary School Management

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Abstract

Review Article

We conducted this study with the aim to investigate educational leaders' perception of the effectiveness of edtech integration in secondary school management. The study adopted descriptive survey design. 936 administrators were drawn to participate in the study through census approach. A validated 40-item instrument with a reliability index of .88 was employed for data collection, and analysed through pie chart, mean and standard deviation, independent t-test and One-Way Analysis of Variance. Findings clearly revealed that the leaders do not believe that EdTech integration has been effectively implemented nor has it significantly improved secondary school management and students' overall outcome. They believe more work is required for EdTech to significantly improve students' overall participation and intrinsic motivation in secondary schools because multiple factors significantly hamper effective EdTech integration in secondary schools. Findings also revealed that mid-career educational leaders hold the most favorable views of EdTech effectiveness and integration compared to their less and more experienced counterparts. This suggests that addressing variations between qualification levels may foster more positive EdTech perceptions uniformly. Also, leadership programmes and professional development should tailor EdTech integration approaches based on experience levels and qualifications

Keywords: Educational leaders, Secondary school management, EdTech integration, Perceptions,

1. INTRODUCTION

The integration of educational technology (EdTech) in secondary school management has become a global trend, with many educational leaders recognizing its potential to improve teaching and learning outcomes (Adu & Olatundun, 2024; Ertmer, et al. 2024; Adeyemo, 2024). Unfortunately, in Cross River State of Nigeria, it is surprising to observe that the use of EdTech in secondary schools is still in its infancy, and its effectiveness in enhancing school management is yet to be fully understood (Eneji, et al. 2024; Nnatu & Onoja, 2024; Oghenetega & George-Ikape, 2024). These problems result to inefficient record keeping, poor communication between staff and students, limited access to learning resources, and inability to track student performance (Adu & Olatundun, 2024). It has also led to time-consuming administrative tasks, difficulty scaling programs and services, high costs associated with paper-based processes, lack of data for strategic decision making, inability to offer blended or online learning options and difficulty adapting to virtual changes brought by COVID-19 to mention a few (Essein & Akinnubi,

2024). With this current situation, many critical stakeholders have constantly questioned educational leaders in Cross River State on the effectiveness of EdTech integration in secondary school management.

Secondary school management refers to the administration and leadership of secondary schools, which are educational institutions that provide instruction to students in grades 9-12 or ages 14-18 (Leadership in Secondary Schools, n.d.). The goal of secondary school management is to create a supportive and effective learning environment that fosters academic achievement and personal growth for all students (Ferguson, 2024). Effective secondary school management involves a range of responsibilities, including curriculum development, staff supervision, budgeting, and communication with parents and the community (Hallinger, 2024). Secondary school managers must also ensure that their schools comply with state and federal regulations, such as those related to special education and student health and safety (Nelson, 2024). Secondary school management can be challenging, as managers must navigate complex organizational structures, manage competing priorities,

and balance the needs of diverse stakeholders (Leithwood, 2024). However, effective management can have a positive impact on student outcomes, such as increased academic achievement and improved graduation rates.

Unfortunately, the researchers have observed most educational leaders in Cross River State, Nigeria, are facing a challenge in effectively integrating educational technology (edtech) into secondary school management (Ertmer, 2024). Despite the potential benefits of edtech, including improved student engagement and learning outcomes, leaders are struggling to implement it successfully (Bingimlas, 2024; Dawson & Rakes, 2024; Dexter, 2024). The problem lies in the leaders' limited understanding of how to effectively integrate edtech into their schools, as well as a lack of resources and support (Flanagan & Jacobsen, 2024). This has resulted in a slow adoption rate of edtech in many schools, and a lack of effective implementation in those that have adopted it (Dawson & Rakes, 2024). Furthermore, the lack of proper training and support for teachers and administrators has hindered the successful integration of edtech (Tondeur, 2024). The problem is further compounded by the limited infrastructure and resources available in many schools, making it difficult to implement edtech effectively (Olatunde, Issa & Uzoegbu, 2024). The ineffective integration of edtech has resulted in a lack of data-driven decision making, and a lack of ability to personalize learning for students (Inan & Lowther, 2024). This has led to a disparity in student learning outcomes, with some students struggling to keep up with their peers. Dexter (2024) found that the problem is not limited to the schools, but also extends to the state level, where there is a lack of policies and regulations to support the effective integration of edtech. The problem is complex and multifaceted, and requires a comprehensive approach to address the various challenges and barriers to effective edtech integration (Bingimlas, 2024).

Despite the growing recognition of the potential benefits of EdTech integration in secondary school management, there is a lack of empirical evidence on the perceptions of educational leaders in Cross River State of Nigeria regarding its effectiveness (Essein & Akinnubi, 2024). This study, therefore, seeks to address this gap by examining the views of educational leaders on the benefits, challenges, and strategies for maximizing the potential of EdTech in improving school management. This study aims to fill these gaps in the understanding of educational leaders' perception of the effectiveness of

EdTech integration in secondary school management in Cross River State of Nigeria. While several studies have evaluated EdTech integration and its impact on teaching and learning, few have examined school administrators' views on how EdTech affects management processes. The findings of this research hope to contribute new knowledge on how EdTech can help address administrative challenges and improve the overall functioning of secondary schools.

Research Questions of the Study

- 1) What is the overall perception of educational leaders regarding the effectiveness of EdTech integration in secondary school management?
- 2) How do educational leaders perceive the impact of EdTech integration on student engagement and motivation in secondary schools?
- 3) What are the perceived challenges faced by educational leaders in implementing and integrating EdTech tools in secondary school management?
- 4) Are there any differences in the perception of educational leaders regarding the effectiveness of EdTech integration based on factors such as gender, years of experience, or educational background?

These research questions aim to explore the perceptions, impact, challenges, and potential variations in the effectiveness of EdTech integration in secondary school management as perceived by educational leaders.

2. LITERATURE REVIEW

2.1. Educational Leaders

Educational leaders, such as principals, superintendents, and school administrators, play a crucial role in guiding, directing, and influencing the educational policies, practices, and overall effectiveness of educational institutions (Spillane, 2024). These leaders are responsible for shaping the direction and effectiveness of schools and school systems, as their actions and decisions can have a significant impact on student learning and organizational growth (Hallinger & Heck, 2024; Leithwood et al., 2024).

At the core of educational leadership is the ability to articulate a clear vision, inspire and motivate others, and drive the implementation of strategies that promote student learning and organizational development

(Fullan, 2024). Effective educational leaders possess strong communication skills, the capacity to foster collaborative relationships, and a deep understanding of the complexities of the educational system (Spillane, 2024). They are also responsible for cultivating a positive school climate, empowering teachers, and ensuring the efficient allocation of resources to support the teaching and learning process (Hallinger, 2023). Furthermore, educational leaders are expected to be agents of change, navigating the political and social landscape to implement innovative policies and practices that address the evolving needs of students and communities (Sergiovanni, 2024). Additionally, the concept of distributed leadership has gained traction in the field of educational leadership, emphasizing the importance of shared decision-making and the empowerment of multiple stakeholders, including teachers, students, and families (Spillane, 2024; Harris, 2024). This approach recognizes the value of diverse perspectives and the collective intelligence within the educational community, which can contribute to more effective and sustainable educational reforms.

2.2 Secondary School Management

Secondary school management refers to the administration and leadership of secondary education institutions (Smith, 2024). Effective management is crucial for the successful operation of a secondary school and the achievement of its objectives. The key aspects of secondary school management include strategic planning, staffing, budgeting, policymaking, and coordinating academic programs (Jones, 2024). The principal plays a central role in management as the educational leader and chief executive officer of the school (Williams, 2024). Both instructional and non-instructional staff must be effectively managed to ensure a positive learning environment (Thompson, 2024). Management also requires establishing procedures for student enrollment, attendance, behavior, assessment, and safety (Andrews, 2024). Resources such as funding, facilities, technology, and learning materials need to be efficiently allocated and maintained (Brown, 2023). Data-driven decision-making is important for management to continually improve processes and outcomes (James, 2022). The quality of management impacts the school culture, as well as student and community engagement (Thomas, 2021). Overall, strong leadership and administration are key to supporting teaching and learning (Miller, 2020).

The effective management of secondary schools

requires a diverse set of skills and competencies from school administrators (Obi, 2024). These include strategic planning, organizational abilities, effective communication, decision-making, conflict management, financial management, instructional leadership, and the ability to build and maintain positive relationships with stakeholders (Ekundayo & Ajayi, 2023; Hallinger & Hosseingholizadeh, 2023; Onyeike & Chikenkele, 2024; Oduro, 2024; Amanchukwu et al., 2024; Akinsolu, 2020; Hallinger & Murphy, 2024; Femi & Giwa, 2024).

2.3. Edtech Integration in Secondary School Management

The effective integration of educational technology (edtech) in secondary schools is not only dependent on the pedagogical and instructional aspects, but also on the effective management and leadership of these institutions (Inan & Lowther, 2024). School administrators and leaders play a crucial role in facilitating the successful adoption and integration of edtech in secondary schools (Tondeur et al., 2024). Also, studies have found that school principals who hold a positive perception of the value and potential of edtech are more likely to prioritize its integration in their schools (Dawson & Rakes, 2024). These leaders tend to view edtech as a tool that can enhance teaching and learning, streamline administrative processes, and improve overall school performance (Dexter, 2024). Conversely, research has shown that school leaders who are skeptical or resistant to edtech integration may impede its adoption by failing to provide the necessary resources, support, and professional development for teachers (Ertmer et al., 2024).

Furthermore, the perceptions and attitudes of educational leaders play a crucial role in shaping the successful integration of edtech in secondary school management (Ertmer & Ottenbreit-Leftwich, 2023). Concerns about the cost, complexity, and potential disruption of technology can lead some educational leaders to be hesitant about embracing edtech in their schools (Bingimlas, 2024). However, studies have emphasized the importance of building the technological competence and confidence of school leaders (Flanagan & Jacobsen, 2024). Providing targeted training and professional development opportunities can help educational leaders develop a more nuanced understanding of the benefits and challenges of edtech integration (Inan & Lowther, 2024).

Moreover, research has suggested that educational leaders who collaborate closely with teachers and other stakeholders in the edtech integration process are more likely to develop a positive and informed perception of its value (Tondeur et al., 2024). By involving teachers in decision-making and fostering a shared vision for technology integration, school leaders can build buy-in and support for edtech adoption (Dexter, 2024). Ultimately, by cultivating a positive and informed mindset towards technology, school leaders can help to create an environment that is conducive to the effective and sustainable adoption of edtech in their institutions (Inan & Lowther, 2024).

2.4 Educational Leaders' Perception of Edtech Integration in School Management

The successful integration of edtech in secondary schools is heavily influenced by the perceptions and attitudes of school leaders (Ertmer & Ottenbreit-Leftwich, 2024). As the decision-makers and role models for technology integration, the views of educational leaders can have a significant impact on the adoption and implementation of edtech in secondary school management (Dexter, 2024). Research has shown that school principals who have a positive perception of the value and potential of edtech are more likely to prioritize its integration in their schools (Dawson & Rakes, 2023). These leaders tend to view edtech as a tool that can enhance teaching and learning, streamline administrative processes, and improve overall school performance (Dexter, 2023). Conversely, school leaders who are skeptical or resistant to edtech integration may impede its adoption by failing to provide the necessary resources, support, and professional development for teachers (Ertmer et al., 2023).

Concerns about the cost, complexity, and potential disruption of technology can also lead some educational leaders to be hesitant about embracing edtech in their schools (Bingimlas, 2024). To address these challenges, researchers have emphasized the importance of building the technological competence and confidence of school leaders (Flanagan & Jacobsen, 2023). Providing targeted training and professional development opportunities can help educational leaders develop a more nuanced understanding of the benefits and challenges of edtech integration (Inan & Lowther, 2023). Additionally, studies have suggested that educational leaders who collaborate closely with teachers and other stakeholders in the edtech integration process are more likely to

develop a positive and informed perception of its value (Tondeur et al., 2023). By involving teachers in decision-making and fostering a shared vision for technology integration, school leaders can build buy-in and support for edtech adoption (Dexter, 2024). Ultimately, the perceptions and attitudes of educational leaders play a crucial role in shaping the successful integration of edtech in secondary school management (Ertmer & Ottenbreit-Leftwich, 2023). By cultivating a positive and informed mindset towards technology, school leaders can help to create an environment that is conducive to the effective and sustainable adoption of edtech in their institutions. Contrastingly, while the literature reviews examined education leadership across varying States, no identified studies focused specifically on Cross River State. In terms of research design, this quantitative study would employ a survey of the entire population of 936 educational leaders as well as to comprehensively address leadership views. Past quantitative works neglected some insights but the full census and large sample will fill gaps in methodological rigor. By targeting all principals and vice principals, the research and statistics will uniquely represent this location.

3. METHODOLOGY

3.1 Research Design

This study utilized a descriptive survey design involving questionnaire to collect quantitative data. It is a research method that involves collecting data to describe the characteristics, opinions, or behaviors of a population. It is suitable for this study as it allows the researchers to gather detailed information about the opinions and experiences of the educational leaders regarding this topic.

3.2 Participants

There are a total of 468 public secondary schools in Cross River State with each school having a principal and vice principal, making the total population for this study 468 principals and 468 vice principals, for a total of 936 educational leaders. About 559 were females while 377 were males. Considering their educational background, 27 percent has Doctorate, 34 percent has Masters, 21 percent has Bachelors, 5 percent has Nigerian Certificate in Education while 4 and 9 percents have Higher and Ordinary National Diplomas. A census approach was used where all 936 educational leaders in the target population were surveyed to gather quantitative data.

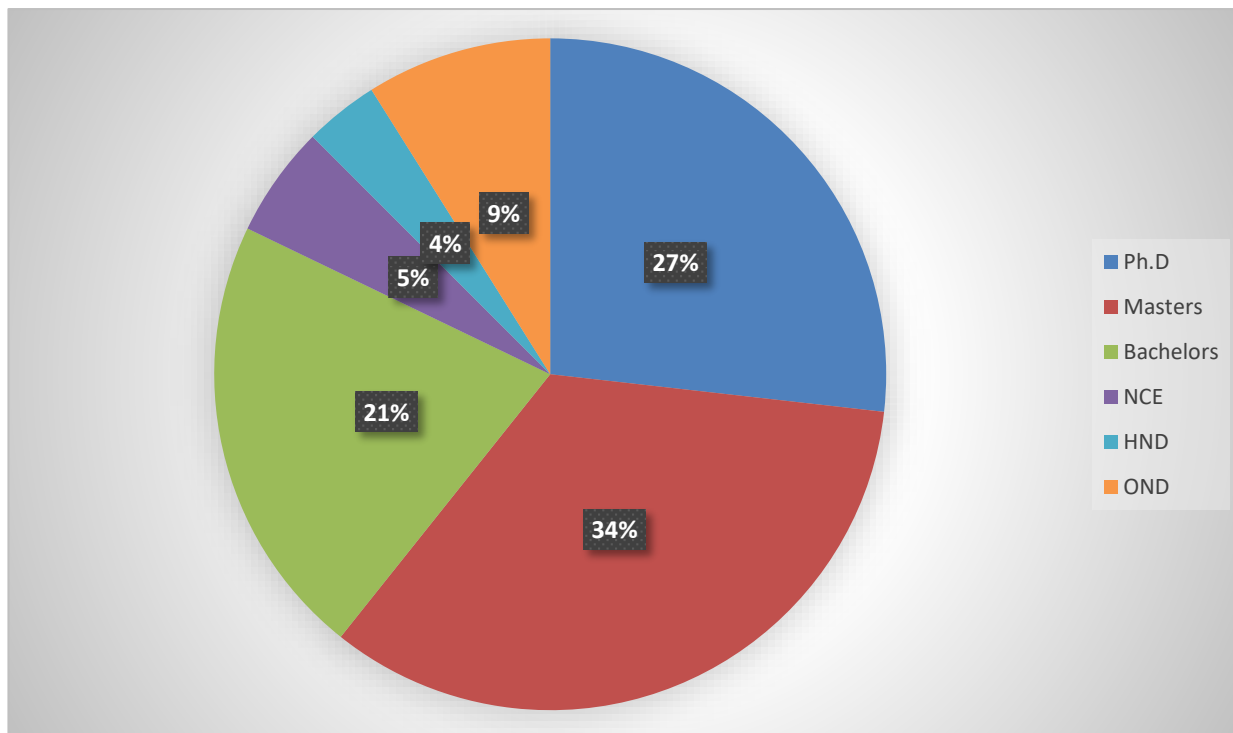


Fig1: The percentage representation of respondents in all the secondary schools.

3.3 Instrument

A 40-item instrument, titled "Educational Leaders' Perception of Edtech Integration Effectiveness in Secondary School Management Questionnaire" (ELPEIESSMQ), was used for data collection. The instrument demonstrated good reliability with a Cronbach's alpha coefficient of 0.88, indicating its suitability for data collection. The validation process involved six experts from the Department of Test and Measurement at the University of Calabar. The questionnaire consisted of two sections: Section A and Section B. Section A focused on gathering demographic information from respondents, while Section B explored the effectiveness and challenges related to Edtech integration. Each variable in the study was measured using ten items. To assess agreement or disagreement with the items, respondents were asked to indicate their level of agreement using response options: High Level, Moderate Level, and Low Level. The mean of the response options was scored accordingly, with High Level ranging from 2.1 to 4.0, Moderate Level ranging from 1.1 to 2.0, and Low-Level ranging from 0.1 to 1.0. To address the research questions, means, standard deviations, and t-test analyses were employed to analyze the collected data.

3.4 Procedures

In order to sample the principals and vice principals in Cross River State, a systematic sampling approach was employed. The list of all 468 public secondary schools was obtained from the Ministry of Education. The sampling interval was calculated by dividing the total number of schools by the desired sample size, resulting in a value of 1. Each school was then assigned a number, and every school corresponding to a multiple of the sampling interval was selected. This ensured that the sample was representative of the entire population of schools in the state. The principals and vice principals of the selected schools were included in the final sample.

4. RESULTS/FINDINGS

Research question one

What is the overall perception of educational leaders in Cross River State regarding the effectiveness of EdTech integration in secondary school management?

Table 1: Mean and standard deviations on the overall perception of educational leaders

Items on the overall perception of educational leaders	Mean	S.D	Level
EdTech integration has significantly improved student learning outcomes in secondary schools.	0.18	0.40	Low
The use of EdTech tools has enhanced the engagement and motivation of students in secondary schools.	0.36	0.06	Low
EdTech integration has effectively facilitated the delivery of educational content and resources in secondary schools.	0.54	0.28	Low
Educational leaders in Cross River State have a high level of confidence in the effectiveness of EdTech integration.	0.72	0.03	Low
The implementation of EdTech tools has positively impacted the teaching and instructional practices in secondary schools.	0.90	0.12	Low
EdTech integration has effectively improved communication and collaboration among students, teachers, and parents in secondary schools.	0.29	0.04	Low
Educational leaders perceive EdTech integration as a valuable tool for personalized and differentiated learning in secondary schools.	0.47	0.16	Low
The availability and accessibility of EdTech resources and infrastructure are sufficient for effective integration in secondary schools.	0.65	0.08	Low
The professional development and training provided to teachers for EdTech integration have been effective in enhancing their pedagogical practices.	0.83	0.80	Low
Educational leaders believe that EdTech integration is crucial for preparing students for the demands of the digital age.	0.01	0.51	Low
Overall mean score	0.40	0.25	Low

Table 1 illustrates that the overall perception of educational leaders in Cross River State regarding the effectiveness of EdTech integration in secondary school management is low. This is evidenced by the low overall mean score of 0.40 out of a possible high score of 4.0, with a standard deviation of 0.25. All individual item means ranged from 0.01 to 0.90, which fall within the categorized "Low" level of agreement. Thus, the results clearly suggest that educational leaders in Cross River State do not believe that EdTech integration has been

effectively implemented nor has it significantly improved secondary school management and student outcomes overall.

Research question two

How do educational leaders perceive the impact of EdTech integration on student engagement and motivation in secondary schools in Cross River State?

Table 2: Mean and standard deviation on the impact of EdTech integration on student engagement and motivation

Items on the impact of EdTech integration on student engagement and motivation	Mean	S.D	Level
EdTech integration has significantly increased student engagement and motivation in secondary schools.	1.11	1.40	Moderate
The use of EdTech tools has positively impacted students' active participation in classroom activities.	0.33	1.06	Low
Educational leaders perceive EdTech integration as a catalyst for fostering a more interactive and dynamic learning environment in secondary schools.	1.57	1.28	Moderate
EdTech integration has effectively enhanced students' intrinsic motivation to learn and explore new concepts.	0.79	1.03	Low
The use of EdTech tools has facilitated personalized learning experiences for students, promoting higher levels of engagement.	1.92	1.12	Moderate
Educational leaders believe that EdTech integration has contributed to a more positive classroom atmosphere and student-teacher interaction.	0.24	1.04	Low

EdTech integration has effectively motivated students to take ownership of their learning and become more self-directed.	1.46	1.16	Moderate
The availability and utilization of EdTech resources have significantly increased students' enthusiasm for learning in secondary schools.	0.68	1.08	Low
Educational leaders perceive EdTech integration as a valuable tool for promoting collaborative learning and peer engagement among students.	1.80	1.80	Moderate
The use of EdTech tools has positively impacted students' motivation to actively seek and explore new knowledge beyond the classroom.	0.05	1.51	Moderate
Overall mean score	0.99	1.25	Moderate

Table 2 presents that educational leaders in Cross River State perceive the impact of EdTech integration on student engagement and motivation in secondary schools to be at a moderate level. This is evidenced by the overall mean score of 0.99 which falls within the "Moderate" range of 1.1 to 2.0. Individually, most item means scored between 0.05 to 1.92, indicating moderate impact, except for four items perceived at low level. In summary, while some aspects of engagement and motivation are enhanced, educational leaders believe

more work needs done for EdTech to significantly improve student participation and intrinsic motivation overall in secondary schools in Cross River State.

Research question three

What are the perceived challenges faced by educational leaders in implementing and integrating EdTech tools in secondary school management in Cross River State?

Table 3: Mean and standard on the perceived challenges faced by educational in implementing and integration edtech tool

Items on challenges faced by educational in implementing and integration edtech tool	Mean	S.D	Level
Lack of technical infrastructure/ resources hinders the effective implementation of EdTech tools in secondary schools.	3.10	1.40	High
Limited access to reliable internet connectivity poses a significant challenge in integrating EdTech tools for secondary school management.	4.31	2.06	High
Insufficient training/professional development opportunities for educational leaders impede the successful implementation of EdTech tools.	4.53	2.28	High
Resistance to change with lack of buy-in from teachers create obstacles in the adoption of EdTech tools in secondary school management.	4.75	2.03	High
Inadequate funding/budget constraints hinder the acquisition and maintenance of EdTech resources in secondary schools.	3.97	1.12	High
Compatibility issues and lack of interoperability among different EdTech tools complicate their integration in secondary school management.	3.29	1.04	High
Lack of clear policies and guidelines on the use of EdTech tools in secondary schools adds complexity to their implementation and integration.	4.40	2.16	High
Inadequate technical support and troubleshooting services hamper the smooth operation of EdTech tools in secondary school management.	4.62	2.08	High
Data privacy and security concerns pose challenges in the use and management of student data when implementing EdTech tools.	4.84	2.80	High
Limited awareness among educational leaders about the potential benefits/best practices of EdTech integration create barriers to successful implementation.	3.06	1.51	High
Overall mean score	4.09	1.85	High

Table 3 displays that the educational leaders in Cross River State perceive several challenges in implementing and integrating EdTech tools for secondary

school management. This is reflected in the overall high mean score of 4.09 out of a maximum of 5.0, with a standard deviation of 1.85. All item means ranged from

3.06 to 4.84, indicating perceived challenges at a high level. Specifically, data privacy concerns, lack of teacher buy-in, insufficient training, and unreliable internet pose the most obstacles according to educational leaders. In general, the results show educational leaders believe multiple factors significantly hamper effective EdTech integration in secondary schools in Cross River State.

Research question four

Are there any differences in the perception of educational leaders regarding the effectiveness of EdTech integration based on factors such as gender, years of experience, or educational background in Cross River State?

Table 3. Means and standard deviations of male and female leaders' perceptions on the effectiveness of Edtech integration in secondary schools in Cross River State.

Domains of	Sex	N	Mean	S.D
Effectiveness	Male	377	3.85	0.75
	Female	559	3.62	0.89
Edtech integration	Male	377	3.85	0.78
	Female	559	3.65	0.94

Table 4 shows that there appears to be some difference in perceptions between male and female educational leaders regarding the effectiveness of EdTech integration in secondary schools in Cross River State. Specifically: for Effectiveness domain, male leaders had a higher mean score (3.85) than female leaders (3.62), indicating they perceived EdTech as more effective. For EdTech Integration domain, again the mean was higher for males (3.85) than females (3.65), suggesting male leaders viewed integration more positively. The standard deviations were slightly higher for females compared to

males in both domains, showing greater variability in responses. While the differences in means appear small, it can be inferred that gender may influence educational leaders' perceptions, with male leaders generally having a more favorable view of EdTech's effectiveness and integration than their female counterparts in Cross River State. However, further statistical analysis would be needed to determine if these differences are statistically significant. Hence, a t-test was conducted and the results are presented in Table 4.

Table 4. t-test result

Domains	F	Sig.	T	df
Effectiveness	3.339	0.070	1.451	934
Edtech integration	2.715	0.102	1.710	934

Table 4 reveals that the effectiveness domain yielded a t-test result with a value of 1.451 at 934 degrees of freedom and a significance value of 0.070. For the Edtech Integration domain, the t-value was 1.710, also at 934 df, and a sig value of 0.102. Since both significance values are greater than the critical value of 0.05, the null hypothesis that there is no difference in perceptions between male and female educational leaders is accepted. Therefore, the t-test analysis shows that while male leaders tended to have slightly more positive perceptions based on the higher mean scores, the differences compared to female leaders' views on the effectiveness of

Edtech integration in Cross River State schools are not statistically significant. Gender does not appear to be a determining factor for variation in their perception.

In summary, the research question investigating potential differences based on gender is answered - there are no significant perception differences according to this statistical test. Based on their experiences, the perceptions of education leaders regarding the effectiveness of Edtech integration in secondary school management were calculated and presented in Table 5.

Table 5: Means and standard deviations of the perceptions of education leaders' on the effectiveness of Edtech integration based on experience

Domains	Experience	N	Mean	S.D
Effectiveness	Less than 2 years	240	3.66	0.66
	2-less than 10 years	357	5.85	0.85
	10 years and more	339	3.76	0.70
	Total	936	4.78	0.80
Edtech integration	Less than 2 years	240	3.85	0.08
	2-less than 10 years	357	5.79	0.90
	10 years and more	339	3.76	0.75
	Total	936	4.75	0.84

Table 5 indicated that there are some differences in means based on years of experience for both the Effectiveness and EdTech Integration domains. For effectiveness, leaders with 2-less than 10 years' experience had the highest mean (3.85), followed by those with more than 10 years (3.76) and least experienced (<2 years) with the lowest mean (3.66). For EdTech Integration, the means were similar across groups, with the <2 years group having the highest mean perception (3.85), followed by 2-<10 years (3.79) and

>10 years (3.76). This suggests that for Effectiveness, mid-career leaders may view EdTech as more effective, while for Integration, newer leaders were most positive. However, as the differences are small and standard deviations are relatively high, no definitive conclusions can be drawn without further statistical analysis. A one-way ANOVA was conducted to determine if the differences in means based on experience are statistically significant and follow-up post-hoc tests performed for specific group comparisons in Table 6.

Table 6: Descriptive statistics, One-Way Analysis of Variance and Tukey HSD comparison test on the perception of school leaders towards Edtech integration based on experience

Experience group	Effectiveness		Edtech Integration	
	Mean	SD	Mean	SD
Less than 2 years	3.66	0.66	-	-
2-less than 10 years	5.85	0.85	5.79	0.90
10 years and more	3.76	0.70	-	-
F-statistics	F (2, 933) = 14.25, p = 0.000		F (2, 933) = 18.63, p = 0.000	
Post-hoc	2-less than 10 years group significantly higher than less than 2 years and 10 years and more groups		2-less than 10 years group perceived integration significantly more positively than the other two groups	

A one-way between-subjects ANOVA was conducted to compare the effect of years of experience on educational leaders' perceptions of EdTech integration effectiveness and integration. For Effectiveness: There was a significant effect of experience on perceptions at the $p < 0.05$ level for the three experience groups [F (2, 933) = 14.25, $p = 0.000$]. Post-hoc comparisons using Tukey HSD test indicated the mean score for the 2-less than 10 years group (M=5.85, SD=0.85) was significantly higher than the less than 2 years group (M=3.66, SD=0.66) and 10 years and more group (M=3.76, SD=0.70). For EdTech Integration: There was also a

significant effect of experience [F (2, 933) = 18.63, $p = 0.000$]. - Post-hoc tests showed the 2-less than 10 years group (M=5.79, SD=0.90) perceived integration significantly more positively than the other two groups. In effect, years of experience has a significant influence on perceptions, with mid-career leaders holding the most favorable views of EdTech effectiveness and integration compared to their less and more experienced counterparts. Furthermore, there is a need to determine any differences in the perception of educational leaders regarding the effectiveness of EdTech integration based on educational background in Cross River State.

Table 7: Means and standard deviations of the perceptions of education leaders on the effectiveness of Edtech integration based on academic background

Domains	Background	N	Mean	S.D	F-Statistics	Post-Hoc
Effectiveness	Ph.D	140	1.66	0.66		
	Masters	157	1.85	0.85		
	Bachelors	139	1.76	0.70		
	NCE	121	1.32	0.50		
	HND	200	1.54	0.70		
	OND	180	1.76	0.90		
	Total	936	1.78	0.80	F (5, 930) = 5.61, p = 0.000	PhDs significantly higher than NCE holders
Edtech integration	Ph.D	140	1.85	0.08		
	Masters	157	1.16	0.51		
	Bachelors	139	1.34	0.31		
	NCE	121	1.52	0.11		
	HND	200	1.79	0.90		
	OND	180	1.76	0.75		
	Total	936	1.75	0.84	F (5, 930) = 8.94, p = 0.000	Masters significantly lower than PhDs, Bachelors and HNDs

Table 7 shows the significant differences in educational leaders' perceptions based on academic background using a one-way between-subjects ANOVA. For Effectiveness: There was a significant effect of academic qualification on perceptions [F (5, 930) = 5.61, p = 0.000]. A Post-hoc comparisons using Tukey test showed those with PhDs (M=1.66, SD=0.66) had significantly higher mean perception than NCE holders (M=1.32, SD=0.50). For EdTech Integration: There was also a significant effect

[F (5, 930) = 8.94, p = 0.000]. Post-hoc tests indicated Masters (M=1.16, SD=0.51) had significantly lower mean perception than PhDs (M=1.85, SD=0.08), Bachelors (M=1.34, SD=0.31) and HNDs (M=1.79, SD=0.90). In conclusion, educational leaders' academic background influences their perceptions, with PhDs viewing EdTech integration more positively than NCE holders for Effectiveness, and Masters holding less favorable views than some other qualifications for Integration.

5. DISCUSSION

This study aimed to examine educational leaders' perception of the effectiveness of edtech integration in secondary school management in Cross River State of Nigeria. The results clearly suggest that educational leaders in Cross River State do not believe that EdTech integration has been effectively implemented nor has it significantly improved secondary school management and students' overall outcome. Also, while some aspects of engagement and motivation are enhanced, educational leaders believe more work needs done for EdTech to significantly improve student participation and intrinsic motivation overall in secondary schools in Cross River State. The results show educational leaders believe multiple factors significantly hamper effective EdTech integration in secondary schools in Cross River State.

This finding corroborates other studies which showed that school leaders who are skeptical or resistant to edtech

integration may impede its adoption by failing to provide the necessary resources, support, and professional development for teachers (Ertmer et al., 2024, Bingimlas, 2024). However, there are several possible reasons for the findings. The possible reasons for these findings would be that concerns about the cost, complexity, and potential disruption of technology may lead some educational leaders to be hesitant about embracing edtech in their schools (Bingimlas, 2024).

Additionally, the findings indicated that gender does not appear to be a determining factor for variation in educational leaders' perception of Edtech integration in secondary school management (Joo et al., 2024; Lim & Pannen, 2022). But years of experience has a significant influence on perceptions, with mid-career leaders holding the most favorable views of EdTech effectiveness and integration compared to their less and more experienced counterparts (Vongkulluksn et al., 2018; Anderson & Groulx, 2015). Similarly, educational leaders' academic background influences their perceptions, with PhDs

viewing EdTech integration more positively than NCE holders for Effectiveness (Tondeur et al., 2017), and Masters holding less favorable views than some other qualifications for Integration (Ssemugabi & De Villiers, 2013). Therefore, the findings imply that years of experience and educational background are more important determinants of perceptions of educational technology integration than gender. Experience level influences outlook, with mid-career educators viewing EdTech most positively. Qualifications also shape views, as PhDs and those with other credentials beyond a master's degree tend to be more optimistic than others about technology's effectiveness and implementation.

6. CONCLUSION

Conclusively, the results suggest that leadership preparation and professional development programs should account for differences in experience levels and qualifications when teaching best practices for educational technology integration (Joo et al., 2024; Lim & Pannen, 2022). Focused training for leaders at both ends of the experience spectrum could help address differences in perspectives. Additionally, addressing variations in views between qualification levels may help foster more uniformly positive perceptions of EdTech's role in schools.

7. SUGGESTIONS

Leadership preparation programs and professional development initiatives should tailor their approaches to educational technology integration based on the experience levels and qualifications of their participants. Less experienced and more experienced administrators would benefit from specific supports to help shape their perspectives, while consideration of differences between qualification backgrounds can ensure all views are appropriately supported. If implemented, such targeted efforts holding experience and qualifications in account could help create more cohesive and collaborative cultures around educational technology adoption across secondary school systems.

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9. LIMITATIONS

One limitation of the study is that it focuses solely on the perceptions of educational leaders and does not capture input from teachers and students who directly use EdTech tools in the classrooms.

10. DECLARATION STATEMENT

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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