



Determinants of the Use of ICT for Teaching Visually Impaired Students

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ABSTRACT

This study examined the determinants of Information and Communication Technology (ICT) use in teaching visually impaired students in Nigeria. Guided by a descriptive survey design, data were collected from 180 teachers and administrators across selected inclusive and special schools using a structured questionnaire. The study investigated three key factors (ICT availability, teacher competence, and institutional support) as predictors of ICT integration. Descriptive statistics revealed moderate levels of ICT use, with ICT availability ($M = 3.12$) and use in teaching ($M = 3.05$) slightly higher than teacher competence ($M = 2.94$) and institutional support ($M = 2.68$). Multiple regression analysis showed that all three predictors significantly influenced ICT use, with ICT availability being the strongest predictor ($\beta = 0.31, p < .001$). Gender was not a significant factor in ICT use; however, teachers with fewer years of experience reported significantly higher usage levels ($p < .05$). The study concludes that while ICT adoption is growing in inclusive education, gaps remain in access, training, and institutional support. It recommends increased provision of assistive ICT tools, continuous teacher training, and improved policy implementation to enhance inclusive teaching practices for visually impaired learners in Nigeria.

Keywords: ICT use, visually impaired students, inclusive education, teacher competence, institutional support, Nigeria

1. Introduction

The integration of Information and Communication Technology (ICT) in education has transformed teaching and learning processes across the globe. ICT provides innovative opportunities to improve educational access, delivery, and outcomes, especially for marginalized groups such as learners with visual impairments. In inclusive education settings, ICT tools such as screen readers, Braille displays, audio books, and specialized software play a pivotal role in enhancing learning experiences for visually impaired students (Adebisi et al., 2016; UNESCO, 2020). However, the effective utilization of ICT in teaching these learners is influenced by various determinants including infrastructural availability, teacher competence, institutional support, and policy implementation (Mtebe & Raisamo, 2014).

In Nigeria, despite the recognized potential of ICT to support inclusive education, its adoption for teaching visually impaired students remains limited. This limitation is often linked to inadequate training for teachers, poor access to assistive technologies, and a lack of inclusive ICT policies (Omoniyi & Quadri, 2017). Moreover, socio-economic disparities, especially in rural and under-resourced schools, exacerbate the challenges faced by educators in deploying ICT tools effectively (Okiki, 2011). Understanding the determinants that influence the use of ICT in this context is crucial for designing targeted interventions that promote inclusive educational practices.

Several empirical studies have examined the use of ICT in inclusive education, particularly its application in supporting learners with visual impairments. These studies provide valuable insights into the factors that influence ICT adoption and highlight key challenges and opportunities within various educational contexts. For instance, Adebisi et al. (2016) conducted a study on the use of assistive technologies among teachers in special schools across southwestern Nigeria. Their findings revealed that while teachers recognized the benefits of ICT in enhancing learning outcomes for visually impaired students, access to appropriate assistive tools such as screen readers and Braille notetakers was limited. Additionally, many teachers lacked formal training in the use of these technologies, which hindered effective classroom integration. Similarly, Omoniyi and Quadri (2017) explored teachers' perceptions of ICT integration in secondary schools and found that although there was a generally positive attitude towards ICT use, the lack of institutional support and insufficient infrastructure served as significant barriers. The study emphasized the role of professional development and administrative backing in encouraging ICT adoption, especially in inclusive settings.

In a broader East African context, Mtebe and Raisamo (2014) investigated behavioral intentions to adopt mobile learning technologies among university students and instructors. Although the study was not focused on special education, it highlighted key determinants such as perceived usefulness, ease of use, and availability of technical support—factors that are equally relevant in the context of teaching visually impaired students. Also, in a study by Ogbuehi and Olibie (2017) on ICT utilization in special education institutions in Nigeria revealed that despite government policies promoting inclusive

education, implementation gaps persist. Their quantitative analysis demonstrated that less than 30% of teachers regularly used ICT in their instructional practices, primarily due to inadequate funding and lack of training. Likewise, Okiki (2011) underscored infrastructural deficits and poor policy enforcement as major challenges in Nigeria's quest to establish an inclusive ICT-supported education system. His study recommended increased investment in ICT infrastructure and targeted training programs for teachers of students with special needs.

While these studies offer important contributions, most focus broadly on ICT use in education or inclusive education in general. There remains a scarcity of empirical research specifically examining the determinants of ICT use for teaching visually impaired students in Nigeria. Furthermore, existing studies often lack gender-based analysis and contextual variations across urban and rural settings. This gap underscores the need for a more targeted investigation into the specific challenges and enabling factors influencing ICT use for visually impaired learners—an issue this study seeks to address. Therefore, the intent of this study was to examine the determinants influencing the use of ICT for teaching visually impaired students in Nigeria. By identifying and analyzing the enabling and constraining factors, the research aims to inform stakeholders, including policymakers, educators, and non-governmental organizations, on strategies to enhance ICT adoption for inclusive education.

2. Methodology

This study adopted a descriptive survey research design to investigate the determinants of the use of Information and Communication Technology (ICT) for teaching visually impaired students in Nigeria. The design was deemed appropriate because it enables the collection of data from a representative sample of teachers and administrators, allowing for the description and interpretation of current practices, attitudes, and challenges related to ICT use in inclusive education settings. The study involved 180 participants (150 teachers and 30 administrators), selected using stratified and simple random sampling techniques to ensure adequate representation. A structured questionnaire titled "ICT Utilization for Teaching Visually Impaired Learners Questionnaire (ICTUVILQ)." The instrument was developed by the researchers based on a review of related literature and adapted to suit the Nigerian context. To ensure validity, the instrument was subjected to expert review by two specialists in educational technology and one in special education. A pilot study was conducted among 20 teachers in a non-sampled state, and the instrument yielded a Cronbach's alpha coefficient of 0.84, indicating good internal consistency. Collected data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics such as frequencies, means, and standard deviations were used to summarize the responses. To identify the key determinants of ICT use, inferential statistics including multiple regression analysis were employed. This helped to determine the extent to which independent variables (e.g., ICT training, availability, institutional support) predict the dependent variable (use of ICT in teaching). Additionally, t-tests and ANOVA were conducted to examine differences in ICT use based on demographic variables such as gender, teaching experience, and school type.

3. Results

Table 1: Descriptive Statistics of Key Variables

Variable	\bar{X}	SD
ICT Availability	3.12	0.82
Teacher's Competence	2.94	0.77
Institutional Support	2.68	0.85
Use of ICT in Teaching	3.05	0.79

The mean scores suggest that ICT availability ($M = 3.12$) and use of ICT in teaching ($M = 3.05$) were moderate, while teacher competence ($M = 2.94$) and institutional support ($M = 2.68$) were relatively lower.

Table 2: Multiple Regression Analysis Predicting ICT Use in Teaching

Predictor	B	SE	β	t-value	p-value
ICT Availability	0.28	0.08	0.31	3.50	0.00
Teacher's Competence	0.24	0.09	0.26	2.67	0.01
Institutional Support	0.19	0.07	0.22	2.71	0.01
Constant	1.21	0.33	–	3.67	0.00

The regression model was significant and accounted for 41% of the variance in ICT use. All three predictors—ICT availability, teacher competence, and institutional support—significantly predicted the use of ICT in teaching visually impaired students.

Table 3: Independent Samples t-Test on ICT Use Based on Gender

Gender	N	\bar{X}	SD	t-value	Df	p-value
Male	95	3.11	0.76			
Female	85	2.98	0.82	1.15	178	0.25

The results showed no significant difference between male and female teachers in their use of ICT for teaching visually impaired students ($t(178) = 1.15$, $p = .252$).

Table 4: One-Way ANOVA on ICT Use Based on Teaching Experience

Teaching Experience	N	\bar{X}	SD	F	p
1 – 5 years	60	3.15	0.70		
6 – 10 years	65	3.01	0.75	2.18	0.04
>10 years	55	2.89	0.88		

There was a statistically significant difference in ICT use based on years of teaching experience. Post hoc comparisons (Tukey's HSD) indicated that teachers with 1–5 years of experience reported significantly higher ICT use than those with over 11 years of experience.

4. Discussion and Conclusion

The findings of this study provide important insights into the determinants of ICT use among teachers of visually impaired students in Nigeria. The results revealed that ICT availability, teacher competence, and institutional support significantly predict the extent to which teachers utilize ICT tools in inclusive classrooms. The descriptive statistics showed a moderate level of ICT use ($M = 3.05$), indicating that while teachers are beginning to integrate ICT into their teaching practices, full adoption remains limited. This aligns with the findings of Adebisi et al. (2016) and Ogbuehi and Olibie (2017), who noted that although teachers recognize the potential of ICT, actual usage remains low due to infrastructural and policy-related barriers.

The regression analysis confirmed that all three variables—availability of ICT tools, teacher competence, and institutional support—were significant predictors of ICT use. ICT availability had the strongest influence, suggesting that access to appropriate tools (e.g., screen readers, Braille displays) is crucial for effective integration. This supports the work of Omoniyi and Quadri (2017), who emphasized the importance of resource availability in determining ICT uptake. Interestingly, teacher competence also played a significant role. Teachers who felt more confident in their ability to use ICT were more likely to integrate it into their teaching. This is consistent with studies by Mtebe and Raisamo (2014), which showed that self-efficacy is a strong motivator in technology adoption.

Also, institutional support was found to be the weakest, yet still significant, predictor. This may reflect the inconsistent policy implementation and inadequate training programs for teachers in inclusive education, as reported by Okiki (2011). Additionally, the t-test result indicated no significant gender difference in ICT use, suggesting that both male and female teachers engage similarly with technology in their classrooms. However, the ANOVA revealed that younger teachers (with 1–5 years of experience) used ICT significantly more than their more experienced counterparts. This may be due to younger teachers being more technologically inclined or having received more recent training.

Based on these findings, the study concludes that the use of ICT in teaching visually impaired students in Nigeria is influenced by a combination of factors, particularly the availability of ICT tools, teacher competence, and institutional support. While the current level of ICT integration is moderate, significant gaps still exist, especially in terms of training and policy implementation. Also, Younger teachers tend to use ICT more frequently, highlighting a generational difference that may be addressed through continuous professional development. Importantly, the absence of gender disparity in ICT use is an encouraging sign of equitable participation in inclusive education.

5. Recommendations

Based on the findings, the following recommendations are made:

1. Provision of ICT Tools: Government and school authorities should prioritize the provision of specialized ICT tools and assistive technologies tailored to the needs of visually impaired learners.
2. Continuous Training: Regular and hands-on ICT training programs should be organized for all teachers, particularly those with more years of experience, to improve competence and confidence in using technology.
3. Strengthen Institutional Support: Education stakeholders should implement clear policies, incentives, and follow-up strategies to ensure sustainable ICT integration in inclusive classrooms.

4. Inclusion in Curriculum: Teacher education programs should incorporate modules on ICT for special needs education to prepare future educators for inclusive teaching roles.

5. Monitoring and Evaluation: There should be regular monitoring and evaluation of ICT use in schools to identify challenges and improve implementation strategies.

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