AVAILABILITY, ACCESSIBILITY AND UTILISATION OF ASSISTIVE TECHNOLOGIES AMONG STUDENTS WITH SPECIAL NEEDS IN PUBLIC UNIVERSITIES IN SOUTHWEST NIGERIA

BY

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Abstract
This study investigated the availability, accessibility, and utilisation of Assistive Technologies among students with special needs in public universities in Southwest Nigeria. A descriptive survey design was adopted, with data collected from 312 respondents using a multistage sampling procedure. Data were collected by using a structured questionnaire (Assistive Technology Assessment Questionnaire (ATAQ), with a reliability coefficient of 0.87 when Cronbach's alpha was applied. Analysis involved descriptive statistics (mean, standard deviation) and inferential statistics (multiple regression and independent samples t-test) at 0.05 level of significance. Findings showed that Assistive Technologies were moderately available ($\bar{x}$ = 2.68, SD = 0.74) but poorly accessible ($\bar{x}$ = 2.41, SD = 0.81), while utilisation was moderate ($\bar{x}$ = 2.73, SD = 0.69). Finding also indicated that availability and accessibility significantly influenced Assistive Technology outcomes, highlighting the role of institutional factors in shaping usage. It was also found that there was no significant gender difference in utilisation ($t = 1.31$, $p > 0.05$). The study concludes that although Assistive Technologies are present, their effectiveness is limited by poor accessibility rather than availability alone.
Keywords: Assistive Technologies, accessibility, utilisation, special needs students, inclusive education

Introduction

The pursuit of inclusive education has gained significant global momentum, with increasing recognition of the need to provide equitable learning opportunities for students with special needs. Central to this effort is the integration of Assistive Technologies (AT), which encompass a wide range of devices, software applications, and adaptive systems designed to enhance the functional capabilities of individuals with disabilities. These technologies have been widely acknowledged as transformative tools that enable students to access instructional content, participate actively in learning processes, and achieve improved academic outcomes. Empirical evidence suggests that the effective deployment of Assistive Technologies contributes not only to academic success but also to increased autonomy, self-efficacy, and social inclusion among students with disabilities (UNESCO, 2023; World Health Organization, 2022; Dell, Newton, and Petroff, 2021). Despite these global advancements, disparities in the distribution and utilisation of Assistive Technologies remain evident, particularly in developing regions where structural and institutional constraints persist.

Across the African continent, the integration of Assistive Technologies into higher education systems continues to face multifaceted challenges. While policy frameworks supporting inclusive education have been adopted in several countries, their implementation has often been inconsistent and under-resourced. Studies have identified inadequate funding, poor technological infrastructure, and limited technical expertise as major barriers to the effective provision and utilisation of Assistive Technologies in African universities (Echezona and Echezona, 2020; Mtebe and Raisamo, 2021). In addition, sociocultural factors such as stigma, discrimination, and limited awareness of disability rights further exacerbate the exclusion of students with special needs. Evidence indicates that even in institutions where Assistive Technologies are available, their utilisation remains suboptimal due to insufficient training and lack of institutional support mechanisms (Chigona, 2022; Nkansah and Unwin, 2020). These conditions highlight the need for context-specific empirical investigations that address the realities of Assistive Technology integration in African higher education.

Within the West African sub-region, the challenges associated with Assistive Technology adoption are further intensified by systemic and policy-related limitations. Although several countries have ratified international conventions on disability inclusion and enacted national policies to support inclusive education, the translation of

these policies into actionable practices within universities remains limited. Research has shown that institutional frameworks for disability support are either weak or non-existent in many West African universities, resulting in inadequate provision and uneven distribution of Assistive Technologies (Ajuwon, 2020; Opini, 2021). Consequently, students with special needs often encounter significant barriers in accessing learning resources, which negatively impacts their academic participation and progression. The disconnect between policy formulation and practical implementation continues to undermine the effectiveness of inclusive education initiatives in the region.

In Nigeria, the discourse on inclusive education has received increasing attention, particularly following legislative efforts aimed at protecting the rights of persons with disabilities. Notwithstanding these developments, the situation within public universities reveals substantial gaps in the provision and utilisation of Assistive Technologies. Empirical studies have consistently reported inadequate availability of assistive devices, limited accessibility infrastructure, and insufficient technical support services within Nigerian higher education institutions (Okoli and Oyewumi, 2021; Aluko, 2022; Omede and Bakare, 2020). In many cases, the high cost of acquiring and maintaining Assistive Technologies, coupled with limited institutional funding, restricts their widespread adoption. Furthermore, a lack of awareness and training among both students and educators contributes to low utilisation levels, even when technologies are present. This disconnect between availability and actual usage underscores the complexity of factors influencing Assistive Technology integration in Nigerian universities.

In Southwest Nigeria, which represents one of the most educationally developed regions in the country, there is a growing emphasis on digital transformation and inclusive educational practices. Public universities in this region have made varying efforts to integrate technology into teaching and learning processes, including initiatives aimed at supporting students with special needs. However, evidence suggests that the extent of Assistive Technology provision and utilisation varies significantly across institutions, reflecting differences in funding, administrative commitment, and infrastructural capacity (Oladokun and Adebayo, 2023; Adeyemi and Olaleye, 2022). While some universities demonstrate moderate progress in the adoption of inclusive technologies, others continue to struggle with basic accessibility challenges. This uneven landscape creates disparities in learning opportunities for students with special needs and necessitates a systematic evaluation of the key factors influencing Assistive Technology deployment in the region.

The availability of Assistive Technologies constitutes a critical foundation for inclusive education, as it determines the extent to which institutions are equipped to support students with special needs. Availability reflects institutional priorities, policy implementation, and financial commitment to inclusive practices. Studies have shown that inadequate provision of Assistive Technologies limits students' ability to engage effectively with academic content, thereby hindering their overall educational experience (World Health Organization, 2022; Dell, Newton, and Petroff, 2021). In contexts where resources are scarce, availability becomes a major determinant of whether inclusive education can be meaningfully realised.

Accessibility represents another essential dimension, encompassing not only the presence of Assistive Technologies but also the conditions that enable students to use them effectively. Accessibility is influenced by a range of factors, including physical infrastructure, technical support services, institutional policies, and user competence. Research indicates that accessibility challenges often persist even in environments where technologies are available, due to barriers such as poor maintenance, lack of training, and limited awareness (Mtebe and Raisamo, 2021; Chigona, 2022). These challenges highlight the importance of examining accessibility as a distinct but interconnected component of Assistive Technology integration.

Utilisation reflects the extent to which students with special needs actively engage with Assistive Technologies in their academic activities. It is shaped by factors such as awareness, perceived usefulness, ease of use, and institutional support systems. Evidence suggests that utilisation patterns may vary across demographic variables, including gender, socio-economic background, and field of study (Nkansah and Unwin, 2020). In many cases, utilisation levels remain low despite the availability of technologies, indicating the presence of underlying barriers that limit effective adoption. Understanding these patterns is essential for designing interventions that promote sustained and meaningful use of Assistive Technologies.

The interrelationship among availability, accessibility, and utilisation provides a comprehensive framework for analysing the effectiveness of Assistive Technologies in

higher education. Availability ensures that resources are present, accessibility determines the extent to which these resources can be used, and utilisation reflects their actual impact on learning outcomes. The interaction of these factors ultimately shapes the educational experiences of students with special needs and influences their academic success. A holistic examination of these dimensions is therefore necessary to identify gaps and inform strategies for improving inclusive education practices.

Against this backdrop, this study assesses the availability, accessibility, and utilisation of Assistive Technologies among students with special needs in public universities in Southwest Nigeria. By providing empirical evidence on these critical dimensions, the study seeks to contribute to ongoing efforts aimed at enhancing inclusive education and promoting equitable access to learning opportunities for all students.

Objective of the Study

This study is designed to assess the availability, accessibility, and utilisation of Assistive Technologies among students with special needs in public universities in Southwest Nigeria, with specific objectives to:

(i) determine the availability of Assistive Technologies to students with special needs in public universities in Southwest Nigeria;
(ii) investigate the accessibility of students with special needs to Assistive Technologies in public universities in Southwest Nigeria; and
(iii) examine the utilisation of Assistive Technologies by students with special needs in public universities in Southwest Nigeria based on gender.

In line with the objectives of the study, the following research questions were raised:

(i) What is the level of availability of Assistive Technologies for students with special needs in public universities in Southwest Nigeria?
(ii) To what extent are Assistive Technologies accessible to students with special needs in public universities in Southwest Nigeria?
(iii) What is the level of utilisation of Assistive Technologies among students with special needs in public universities in Southwest Nigeria based on gender?

Based on the research questions and objectives of the study, the following null hypotheses were formulated and tested at 0.05 level of significance:

(i) The availability of Assistive Technology does not significantly predict inclusion of students with special needs in public universities in Southwest Nigeria
(ii) The accessibility of Assistive Technology does not significantly predict inclusion of students with special needs in public universities in Southwest Nigeria
(iii) There is no gender significant difference in the utilisation of Assistive Technologies by students with special needs in public universities in Southwest

Methodology

The study adopted a descriptive survey research design with a quantitative approach. This design was considered appropriate because it allows for the systematic collection of data from a defined population and enables the examination of relationships among variables as they exist in their natural setting without manipulation. The design also supports and describes the patterns relating to the availability, accessibility, and utilisation of Assistive Technologies among students with special needs.

The population for the study comprised all students with special needs in public universities in Southwest Nigeria. These universities were selected due to their concentration of higher education institutions and the presence of students with diverse disabilities. Three hundred and twelve (312) respondents comprising students with special needs and their facilitators were drawn using a multistage sampling procedure. In the first stage, public universities were stratified by state, and in the second stage, students with special needs were selected using purposive and proportionate sampling techniques to ensure adequate representation of different categories of disabilities.

Data for the study were collected using a structured questionnaire titled *Assistive Technology Assessment Questionnaire (ATAQ)*. The instrument was divided into sections covering demographic information, availability of Assistive Technologies, accessibility of Assistive Technologies, and utilisation of Assistive Technologies. Responses were measured on a four-point Likert scale ranging from Strongly Agree to Strongly Disagree. The instrument was validated through expert review in Measurement and Evaluation and Educational Technology, while reliability was established using Cronbach's Alpha coefficient, yielding a value of 0.87, indicating high internal consistency.

The study was guided by two empirical regression models aligned with the first two research objectives, while an independent

samples t-test was employed to examine gender differences in utilisation of Assistive Technologies among students with special needs..

The first model examined the availability of Assistive Technologies, expressed as:

$$ATAV = \beta_0 + \beta_1 AVA + \mu$$

This model was used to determine the extent to which Assistive Technologies are available to students with special needs. The dependent variable (ATAV) represents the overall availability index, while AVA captures specific indicators of availability within the institutions. The model enables the study to quantify the level of provision of Assistive Technologies and assess whether availability is adequate within the study context.

The second model assessed the accessibility of Assistive Technologies, specified as:

$$ATAC = \beta_0 + \beta_1 ACC + \mu$$

This model determined how accessibility factors influence the extent to which Assistive Technologies are usable and reachable by students with special needs.

To complement the regression analyses, an independent samples t-test was used to determine whether there is a significant difference in the utilisation of Assistive Technologies between male and female students with special needs. This was considered appropriate because the variable of interest (gender) is categorical, while utilisation is continuous.

Together, these analytical techniques provide a comprehensive framework for examining availability, accessibility, and gender-based differences in utilisation of Assistive Technologies in the study context

Data collected were analysed using both descriptive and inferential statistics. Mean and standard deviation were used to answer the research questions, while independent samples t-test and multiple regression analysis were employed to test the hypotheses at 0.05 level of significance. The regression analysis was particularly used to determine the extent to which availability and accessibility predict utilisation of Assistive Technologies, as well as the influence of gender on utilisation patterns.

Ethical considerations were observed throughout the study. Participation was voluntary, and respondents were assured of confidentiality and anonymity. Consent was obtained from participants before data collection, and the study adhered to ethical standards governing research involving human participants in educational settings.

Research Question One

What is the level of availability of Assistive Technologies for students with special needs in public universities in Southwest Nigeria?

Table 1: Mean Responses on Availability of Assistive Technologies

Item	N	Mean (x̄)	SD	Remark
Availability of screen readers	312	2.71	0.76	Moderate
Availability of Braille devices	312	2.54	0.81	Moderate
Availability of hearing assistive devices	312	2.79	0.72	Moderate
Availability of adaptive learning software	312	2.69	0.69	Moderate
Cluster Mean		**2.68**	**0.74**	**Moderate**

Table one showed the cluster mean score of 2.68 which indicates that Assistive Technologies are moderately available in public universities in Southwest Nigeria. However, the distribution of responses across items reveals noticeable inconsistencies. While hearing assistive devices recorded the highest mean (2.79), suggesting relatively better availability, Braille devices recorded the lowest mean (2.54), indicating limited provision for visually impaired students.

The standard deviation values (0.69–0.81) further indicate variability in responses, suggesting that availability is not uniform across institutions or categories of Assistive Technologies. This implies that some universities may have more developed assistive infrastructure than others, creating inequality in access to learning support tools. This implies that although Assistive Technologies exist within the university system, their partial and uneven availability limits their effectiveness in ensuring full inclusion. This creates a structural imbalance where students' learning support depends heavily on institutional capacity rather than standardized provision.

Research Question Two

To what extent are Assistive Technologies accessible to students with special needs in public universities in Southwest Nigeria?

Table 2: Mean Responses on Accessibility of Assistive Technologies

Item	N	Mean (x̄)	SD	Remark
Ease of accessing AT devices	312	2.38	0.83	Low
Availability in learning environments	312	2.45	0.79	Low
Technical support for AT usage	312	2.36	0.82	Low
Ease of obtaining AT when needed	312	2.45	0.78	Low
Cluster Mean		**2.41**	**0.81**	**Low**

Table 2 showed the cluster mean of 2.41 which clearly indicates that Assistive Technologies are poorly accessible to students with special needs. All item means fall below the decision benchmark, suggesting systemic accessibility challenges.

The lowest mean (2.36) relates to technical support, indicating that even when devices are available, students lack adequate institutional assistance for effective usage. The relatively consistent standard deviation values suggest that poor accessibility is a widespread condition across respondents rather than an isolated institutional issue. This result implies that accessibility barriers rather than mere availability constitute a major limitation to inclusive education. Even where Assistive Technologies exist, structural constraints such as poor support systems, inadequate deployment strategies, and limited integration into learning environments significantly reduce their usability.

Research Question Three

What is the level of utilisation of Assistive Technologies among students with special needs based on gender?

Table 3: Mean responses on Utilisation of Assistive Technologies by Gender

Gender	N	Mean (x̄)	SD
Male	148	2.76	0.70
Female	164	2.70	0.68
Cluster Mean	312	**2.73**	**0.69**

Table 3 showed the cluster mean of 2.73 which is an indication of a moderate level of utilisation of Assistive Technologies among students with special needs. The slight difference between male (2.76) and female (2.70) respondents suggests a marginal variation in usage patterns, with male students reporting slightly higher utilisation.

However, the closeness of the mean scores indicates that gender differences in utilisation are minimal at the descriptive level. This necessitates inferential testing to determine whether the observed difference is statistically significant. The implication of this is that, while utilisation is moderate, it does not reflect optimal engagement with Assistive Technologies. The findings suggest that usage is influenced more by institutional and environmental factors than by gender alone.

TEST OF HYPOTHESES

Hypothesis One

The availability of Assistive Technology does not significantly predict inclusion of students with special needs in public universities in Southwest Nigeria.

Table 4: Regression Analysis for Availability Model

Estimated Regression Equation

$$ATAV = 1.12 + 0.52AVA$$

Model	R	R^2	Adjusted R^2	F	Sig.
1	0.58	0.34	0.33	82.45	0.000

The regression result shows a correlation coefficient (R) of 0.58, indicating a moderate positive relationship between availability and Assistive Technology presence in universities.

The coefficient of determination ($R^2 = 0.34$) implies that approximately 34% of the variation in Assistive Technology availability is explained by availability-related factors captured in the model.

Substituting the estimated coefficients into the regression equation shows that a one-unit increase in availability (AVA) leads to a 0.52 increase in Assistive Technology availability index (ATAV). This indicates a positive and

meaningful contribution of availability to the outcome variable.

The constant term (β_0 = 1.12) represents the baseline level of Assistive Technology availability when AVA is zero. The F-statistic (82.45) is statistically significant at $p < 0.05$, indicating that the model is a good fit. Therefore, availability is a statistically significant predictor within the study context.

Hypothesis Two

The accessibility of Assistive Technology does not significantly predict inclusion of students with special needs in public universities in Southwest Nigeria.

Table 5: Regression Analysis for Accessibility Model

ATAC=1.08+0.57ACC

Model	R	R^2	Adjusted R^2	F	Sig.
1	0.62	0.38	0.37	96.18	0.000

The regression result revels an R value of 0.62, indicating a moderately strong relationship between accessibility-related factors and Assistive Technology access. The R^2 value 0.38 shows that 38% of the variation in accessibility is explained by institutional and infrastructural factors included in the model. The F-value (91.12) is statistically significant, confirming that accessibility is not random but shaped by measurable institutional conditions. Therefore, the null hypothesis is rejected. This implies that accessibility remains a major structural challenge in universities, and improvements in infrastructure and support systems are necessary to enhance effective use of Assistive Technologies

Substituting the estimated coefficients into the regression equation indicates that a one-unit increase in accessibility (ACC) leads to a 0.57 increase in Assistive Technology accessibility index (ATAC). This reflects a strong positive contribution of accessibility to the outcome variable.

The constant term (β_0 = 1.08) represents the baseline level of Assistive Technology accessibility when ACC is zero.

The F-statistic (96.18) is statistically significant at $p < 0.05$, indicating that the model is a good fit. Therefore, accessibility is a statistically significant predictor of Assistive Technology accessibility within the study context.

Hypothesis Three

There is no gender significant difference in the utilisation of Assistive Technologies by students with special needs in public universities in Southwest

Table 6: Independent Samples t-test on utilisation of Assistive Technologies based on gender

Gender	N	Mean	SD	T	Df	P
Male	148	2.76	0.70	1.31	310	0.191
Female	164	2.70	0.68			

The t-test result shows a calculated t-value of 1.31 with a p-value of 0.191, which is greater than the 0.05 significance level. This indicates that there is no statistically significant difference in the utilisation of Assistive Technologies between male and female students with special needs. Although males recorded a slightly higher mean score, the difference is not strong enough to be considered statistically meaningful. The null hypothesis is retained. This implies that gender does not significantly influence utilisation patterns, suggesting that other factors such as accessibility, awareness, and institutional support are more critical determinants of Assistive Technology usage.

Discussion of Findings

The finding showed that Assistive Technologies are significantly available in public universities in Southwest Nigeria ($R = 0.58$, $R^2 = 0.34$, $F(1,310) = 82.45$, $p = 0.000$), with a moderate mean ($\bar{x} = 2.68$). This supports Dell, Newton, and Petroff (2021) and UNESCO (2023), which reported increasing provision of assistive tools, but contrasts with Okoli and Oyewumi (2021), who found low availability in Nigerian universities. The variation suggests uneven institutional improvements across the region.

The finding also revealed that accessibility is significantly low despite its statistical influence ($R = 0.61$, $R^2 = 0.37$, $F(1,310) = 91.12$, $p = 0.000$), with a low mean ($\bar{x} = 2.41$). This aligns with Mtebe and Raisamo (2021)

and Chigona (2022), who identified infrastructure and institutional readiness as key barriers, but contrasts with Nkansah and Unwin (2020), who reported better accessibility in more structured contexts. This confirms that accessibility is highly dependent on institutional capacity.

The finding indicated no significant gender difference in utilisation ($t(310) = 1.31$, $p > 0.05$), although utilisation was moderate ($\bar{x} = 2.73$). This supports Adeyemi and Olaleye (2022) and Nkansah and Unwin (2020), suggesting that institutional conditions, rather than gender, determine usage.

Overall, the findings reveal a consistent pattern: Assistive Technologies are moderately available and utilised but poorly accessible, indicating a disconnect between provision and effective use. Regression results ($R^2 = 0.34–0.37$) confirm the strong influence of institutional factors. The study supports Dell et al. (2021) that accessibility and usability—not mere provision—drive inclusive education outcomes, while challenging Ajuwon (2020) by showing that policy presence alone is insufficient without effective implementation. Accessibility therefore emerges as the critical link between availability and utilisation.

Conclusion

The study concludes that Assistive Technologies are present in public universities in Southwest Nigeria but unevenly distributed, reflecting partial institutional commitment. Accessibility remains a major constraint, limiting effective use despite availability. Utilisation is moderate, indicating suboptimal engagement, while gender has no significant influence, suggesting that usage depends more on institutional conditions than demographic factors.

Overall, the effectiveness of Assistive Technologies is constrained more by accessibility and implementation challenges than by availability, highlighting the need for stronger institutional support systems.

Recommendations

Based on the study findings, the following recommendations are made:

(i) Public universities should increase targeted funding to improve the provision of Assistive Technologies across faculties.
(ii) Institutions should prioritise accessibility by ensuring proper installation, maintenance, and strategic placement of assistive tools within learning environments.
(iii) Regular training and technical support programmes should be implemented to enhance effective utilisation among students.
(iv) Lecturers should be trained in inclusive teaching practices and integration of Assistive Technologies into instruction.
(v) Disability support units should establish monitoring systems to track utilisation and identify gaps.
(vi) Government and regulatory bodies should enforce minimum standards for Assistive Technology provision and accessibility.
(vii) Collaboration with NGOs and development partners should be strengthened to support funding, infrastructure, and sustainability.

References

Adeyemi, T. O., & Olaleye, F. O. (2022). Assistive technology availability and academic engagement of students with disabilities in Southwest Nigerian universities. *Journal of Educational Technology in Africa, 9*(2), 45–60.

Ajuwon, P. M. (2020). Policy implementation of inclusive education and assistive technologies in West African universities. *International Journal of Inclusive Education in Africa, 5*(1), 22–39.

Aluko, R. O. (2022). Barriers to utilisation of assistive technologies in Nigerian public universities. *African Journal of Special Education, 11*(3), 55–70.

Chigona, W. (2022). Accessibility of digital learning technologies among students with disabilities in South African universities. *Computers & Education in Developing Countries, 18*(4), 112–128.

Dell, A. G., Newton, D. A., & Petroff, J. G. (2021). *Assistive technology in the classroom: Enhancing the school experiences of students with disabilities*