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RESEARCH ARTICLE

Knowledge, Perception and Attitude of Users with Visual Impairment on E-Banking Systems in Nigeria

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Abstract: The rapid expansion of digital banking services has increased accessibility and convenience for users, including persons with disabilities. This study investigated the knowledge, perception, and attitudes of users with visual impairment towards e-banking systems in Oyo State, Nigeria. Specifically, the study examined the relationship among knowledge, perception, accessibility, and attitudes towards e-banking among users with visual impairment. A descriptive survey research design was adopted for the study. Purposive sampling technique was used to select 47 respondents with visual impairment comprising 24 males and 23 females. Data were collected using a structured questionnaire and analysed using descriptive and inferential statistics, including mean, standard deviation, and Pearson Product Moment Correlation (PPMC). The findings revealed a significant relationship between accessibility and usability of e-banking platforms among users with visual impairment. The study further showed that although respondents demonstrated awareness of e-banking services, challenges relating to accessibility, screen-reader compatibility, digital literacy, and transaction security still affect effective utilization. The study recommends that financial institutions should organize specialized digital literacy training for users with visual impairment, improve compatibility of e-banking applications with screen readers and voice-assisted technologies, strengthen transaction security through audio-based verification and multi-factor authentication, and develop more inclusive and accessible e-banking platforms.

Keywords: knowledge, perception, Attitude, E-banking, Visual Impairment

INTRODUCTION

The banking industry has experienced rapid digital transformation through the adoption of electronic banking (e-banking) systems such as mobile banking applications, automated teller machines (ATMs), internet banking, and Unstructured Supplementary Service Data (USSD) services. These technologies enable users to perform financial transactions conveniently without visiting physical bank branches. E-banking has improved the efficiency, speed, and accessibility of financial services for many users globally. However, despite these advancements, the accessibility and usability of e-banking systems remain a major concern for persons with disabilities, particularly users with visual impairment.

Abodunrin and Abodunrin (2020) perceived visual impairment as a condition characterized by deficiency in the organ of sight which hinders an individual's ability to perform functions that require vision. Similarly, Abilu et al, (2025) described persons with visual impairment as individuals with reduced or complete loss of sight that limits their participation in daily activities, mobility, social interaction, and environmental exploration. Kavitha et al. (2015) further explained that visual impairment may involve irreversible vision loss, restricted visual field, reduced contrast sensitivity, and difficulty in performing activities such as reading and writing.

The development of e-banking technologies has created opportunities for persons with visual impairment to access financial services independently. Through digital banking platforms, users can transfer funds, check account balances, make payments, and conduct other banking transactions without physically visiting banking halls. To effectively access these services, persons with visual impairment often depend on assistive technologies such as screen readers, voice command systems, magnification software, and Braille-enabled devices. These technologies support independent navigation, transaction verification, and secure financial management.

Despite the benefits associated with e-banking systems, users with visual impairment continue to experience substantial accessibility challenges. Many e-banking applications are not fully compatible with screen readers and other assistive technologies. Users frequently encounter

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inaccessible mobile interfaces, inadequate audio feedback, complex navigation structures, image-based verification systems, and poor universal design features Inaccessible banking websites and ATMs can prevent persons with visual impairment from carrying out transactions independently and may expose them to privacy risks when they must rely on others for assistance. Hassan et al, (2020) showed that e-banking accessibility barriers remain a major obstacle to independent financial participation for people with visual disability. Imandojemu et al, (2018) found that persons with disabilities in Nigeria face significant barriers in accessing ATMs and mobile banking services, including lack of Braille signage and inaccessible interfaces. While Web Accessibility Initiative (2023) recommended that digital platforms should support screen readers, keyboard navigation, alternative text, and accessible interface structures to ensure equal access for users with disabilities. In many cases, banking applications rely heavily on visual icons, touch-screen interactions, and graphical instructions that are difficult for users with visual impairment to interpret independently.

As a result of these accessibility barriers, many users with visual impairment depend on family members, friends, or third parties to complete financial transactions. This dependence increases the risk of fraud, privacy violations, and financial insecurity. Transaction security therefore is an important concern among users with visual impairment. Due to difficulties in independently verifying transaction details, users with visual impairment may feel vulnerable when using e-banking platforms. Adamu and Haliru (2025) noted that concerns relating to unauthorized transactions, online fraud, and data privacy negatively influence trust and willingness to adopt digital banking technologies among persons with disabilities. Furthermore, inconsistent accessibility support across banking platforms contributes to frustration and discourages continuous use of e-banking services.

The integration of e-banking systems has also shaped the knowledge, perceptions, and attitudes of users with visual impairment toward digital banking technologies. Knowledge refers to the awareness and understanding of how e-banking systems operate, including the ability to navigate platforms and utilize assistive technologies effectively. Lack of knowledge about adaptive technologies such as Braille-enabled ATMs, screen readers, and voice-assisted applications may create a digital divide that limits financial inclusion among persons with visual impairment (Ajiboye and Ibrahim, 2023).

Perception refers to how individuals interpret and make sense of the systems and technologies they interact with. For users with visual impairment, perception of e-banking systems is influenced by accessibility, usability, security, and previous user experiences (Babin and Harris, 2020). When users perceive e-banking systems as accessible, secure, and user-friendly, they are more likely to adopt and utilize such technologies effectively (Jamshaid et al., 2025; Oyefolahan et al., 2019). Conversely, inaccessible platforms, poor interface design, inadequate customer support, and lack of assistive technology integration often contribute to negative perceptions and reluctance toward e-banking adoption (Okonji & Ogwezzy, 2019).

The Technology Acceptance Model explains that perceived usefulness and perceived ease of use influence users' attitudes and behavioral intentions toward technology adoption (Davis, 1989). The Technology Acceptance Model (TAM) provides a useful framework for understanding the adoption of e-banking technologies among users with visual impairment. TAM explains that perceived usefulness and perceived ease of use influence users' attitudes and intentions toward adopting technology. Venkatesh et al. (2003) further explained through the Unified Theory of Acceptance and Use of Technology (UTAUT) that facilitating conditions, perceived ease of use, and user confidence significantly influence technology adoption behaviour. In the context of this study, inadequate accessibility support and limited training opportunities may reduce the confidence of users with visual impairment in independently using e-banking platforms. In the this study, accessibility features such as screen reader compatibility, voice-guided navigation, and user-friendly interfaces may influence users' knowledge, perceptions, and attitudes toward e-banking systems. Similarly, the concept of digital financial inclusion emphasizes that financial technologies should be accessible to all individuals regardless of disability status, while universal design principles advocate for systems that accommodate diverse users without requiring specialized adaptation. Tan and Teo (2000) emphasized that perceived usefulness, accessibility, and facilitating conditions influence users' adoption of internet banking technologies. This suggests that accessibility features such as screen reader compatibility, voice-guided navigation, and user-friendly interfaces may shape the willingness of users with visual impairment to adopt e-banking services.

Several studies have examined e-banking adoption and accessibility among persons with disabilities. However, most previous studies focused broadly on technology adoption and financial inclusion without specifically examining the interaction among knowledge, perception, and attitudes of users with visual impairment within Nigeria. In addition, there is limited empirical evidence on the specific barriers faced by users with visual impairment in accessing e-banking services in Oyo State, Nigeria. Previous studies have also paid limited attention to issues such as dependence on others during financial transactions, perceptions of transaction security, and the influence of accessibility challenges on attitudes toward e-banking adoption. Consequently, there is insufficient localized evidence regarding how users with visual impairment in Oyo State experience and perceive e-banking systems.

This study therefore investigates the knowledge, perception, and attitudes of users with visual impairment toward e-banking systems in Oyo State, Nigeria. Specifically, the study examines users' level of knowledge of e-banking services, their perceptions regarding accessibility and usability, and their attitudes toward the use of e-banking systems.

METHODS

This study adopted a cross-sectional correlational survey research design to investigate the knowledge, perception, and attitudes of users with visual impairment toward e-banking systems in Oyo State, Nigeria. The population of the study comprised persons with visual impairment who use or have previously used e-banking services. The Respondents were from selected rehabilitation centres, special education institutions, and disability support associations within Oyo State. Purposive sampling technique was used to select 47 respondents comprising 24 males and 23 females. The technique was considered appropriate because the study specifically focused on individuals with visual impairment who had experience using e-banking platforms. Inclusion criteria included persons diagnosed with visual impairment, including individuals who were totally blind or had low vision,

respondents with experience using e-banking services, and individuals who voluntarily consented to participate in the study while persons without visual impairment below 18 years of age who may not have gotten bank verification number are excluded and those who were unwilling to provide informed consent were excluded from the study. Visual impairment status was verified through respondents' self-identification as either totally blind or low vision during the screening process. In addition, Snellen chart was used to screen the respondents. Data were collected using a structured questionnaire. The instrument was validated by experts in special education, measurement and evaluation. A pilot study conducted among persons with visual impairment outside the study area yielded Cronbach's alpha reliability coefficients of 0.81 for knowledge, 0.84 for attitude, and 0.79 for accessibility and usability. The questionnaire was administered through braille, goggle form using screen-reader depending on respondents' preferences. The data were analysed using descriptive statistics of frequency count, percentages, mean and standard deviation. Pearson Product Moment Correlation (PPMC), at 0.05 level of significance.

RESULTS OF STUDY

Table 1 presents the socio-demographic characteristics of the respondents. The results showed that 24 respondents (51.1%) were male, while 23 respondents (48.9%) were female, indicating a slightly higher proportion of male respondents. Most respondents were between 18 and 25 years of age (57.4%), followed by those aged 26–35 years (31.9%). The majority of the respondents were single (89.4%) and unemployed (57.4%). In terms of educational qualification, most respondents possessed NCE certificates (74.5%). Regarding visual status, 53.2% of the respondents were totally blind, while 46.8% had low vision.

Research question one: What is the level of the level of knowledge on e-banking system among users with visual impairment in Oyo State.

Table 2 presents findings on respondents' awareness and operational knowledge of e-banking systems. The results indicated that respondents generally demonstrated high awareness of e-banking services and platforms. For instance, 44 (93.6%) respondents agreed that they were aware of e-banking services (Mean = 4.40, SD = 0.68), while 45 (95.8%) indicated familiarity with different e-banking platforms such as mobile banking, internet banking, USSD, and ATM services (Mean = 4.38, SD = 0.64). Similarly, 41 (87.2%) respondents reported awareness of assistive technologies such as screen readers that support e-banking access for persons with visual impairment (Mean = 4.30, SD = 0.95).

However, findings relating to operational knowledge revealed some limitations. Although respondents were generally aware of e-banking services, fewer respondents indicated that they could independently navigate e-banking applications (Mean = 3.38, SD = 1.48). In addition, the item on receiving adequate training recorded a relatively lower mean score (Mean = 3.19, SD = 1.32), while attendance at training or workshops specifically designed for users with visual impairment had the lowest mean score (Mean = 2.45, SD = 1.42). This suggests that awareness of e-banking does not necessarily translate into sufficient practical skills for secure and independent usage.

Furthermore, 39 (83.0%) respondents agreed that they had encountered challenges while learning to use e-banking services (Mean = 3.98, SD = 1.13), indicating that accessibility and usability barriers remain significant concerns among users with visual impairment.

The overall weighted mean of 3.81, which is higher than the criterion mean of 3.00, indicates a relatively high level of awareness and general knowledge of e-banking systems among users with visual impairment in Oyo State. Nevertheless, the findings also reveal important gaps in operational competence and accessibility training.

Table 1. Socio-Demographic Characteristics of Respondents (N = 47)

Variable	Category	Frequency	Percentage (%)
Gender	Male	24	51.1
	Female	23	48.9
Age Range	18–25 years	27	57.4
	26–35 years	15	31.9
	36–45 years	3	6.5
	46–55 years	1	2.1
	56 years and above	1	2.1
Marital Status	Single	42	89.4
	Married	5	10.6
Employment Status	Employed full-time	6	12.8
	Self-employed	14	29.8
	Unemployed	27	57.4
Educational Qualification	SSCE	1	2.1
	NCE	35	74.5
	OND/HND	1	2.1
	B.Sc./B.Ed	7	14.9
	Others	3	6.4
Degree of Visual Impairment	Totally blind	25	53.2
	Low vision	22	46.8
Onset of Impairment	Congenital	17	36.2
	Acquired	30	63.8

Source: Author's Field Survey, 2025

Research question two: What is the level of the attitudes of users with visual impairment on e-banking system.

Table 3 presented results on the attitudes of users with visual impairment toward adopting e-banking services and findings showed that 45 (95.8%) of the respondents agreed that they believe banks should offer personalized training for users with visual impairment while 2(4.2%) were disagree as supported with ($\bar{\chi}$ =4.49; std. dev.= 0.80) followed by 42 (89.3%) of the respondents that agreed that they would like to receive more training to enhance my e-banking skills while 5 (10.7%) of the respondents disagreed with the statement as supported with ($\bar{\chi}$ = 4.45; std. dev.= 0.92). Also, 42 (89.3%) of the respondents agreed that they were willing to adopt e-banking services despite accessibility challenges while 5 (10.7%) of the respondents disagreed with the statement as supported by ($\bar{\chi}$ =4.19; std. dev.= 0.85). In additional 41 (87.3%) of the respondents agreed that their experience with e-banking has been positive overall while 6 (12.7%) disagreed as supported by ($\bar{\chi}$ =4.13; std. dev.= 1.09) and 40 (85.1%) of the respondents

agreed that they believe e-banking is a reliable alternative to traditional banking while 7 (14.9%) disagreed as supported by ($\overline{\chi}$ =4.04; std. dev.= 1.10) et cetera. The overall weighted mean of 3.80 greater than standard mean of 3.00 suggests that, there is positive attitudes of users with visual impairment toward adopting e-banking services.

Table 2. Awareness and Knowledge of E-Banking System

S/N	Item Description	SD (%)	D (%)	Un (%)	A (%)	SA (%)	$\overline{X}$	S. Dev.	Rank
1	I am aware of e-banking services.	0 (0.0)	1 (2.1)	2 (4.3)	21 (44.7)	23 (48.9)	4.40	.68	1
2	I frequently use e-banking services.	2 (4.3)	7 (14.9)	3 (6.4)	14 (29.8)	21 (44.7)	3.96	1.23	6
3	I am familiar with different e-banking platforms (mobile banking, internet banking, USSD, ATM)	0 (0.0)	1 (2.1)	1 (2.1)	24 (51.1)	21 (44.7)	4.38	.64	2
4	I have received adequate training on using e-banking services.	4 (8.5)	17 (36.2)	0 (0.0)	18 (38.3)	8 (17.0)	3.19	1.32	9
5	I understand how to navigate e-banking applications independently.	6 (12.8)	12 (25.5)	2 (4.3)	12 (25.5)	15 (31.9)	3.38	1.48	8
6	I am aware of the security measures associated with e-banking	4 (8.5)	3 (6.4)	1 2.1)	25 (53.2)	14 (29.8)	3.89	1.16	7
7	I believe e-banking is more convenient than traditional banking.	1 (2.1)	3 (6.4)	1 (2.1)	21 (44.7)	21 (44.7)	4.23	.93	4
8	I have encountered challenges in learning how to use e-banking services.	2 (4.3)	6 (12.8)	0 (0.0)	22 (46.8)	17 (36.2)	3.98	1.13	5
9	I am aware of assistive technologies (such as screen readers) that can help users with visual impairment in e-banking.	0 (0.0)	5 (10.6)	1 (2.1)	16 (34.0)	25 (53.2)	4.30	.95	3
10	I have attended training or workshops on e-banking for users with visual impairment .	3 (6.4)	4 (8.5)	5 (10.6)	28 (59.6)	7 (14.9)	2.45	1.42	10
	N=47, Average mean=3.81, Weighted mean=3.00						3.81	1.094	

Source: Author's Field Survey, 2025
Key; Strongly Disagree (SD=1), Disagree (D=2), Undecided (Un=3), Agreed (A=4), Strongly Agree (SA=5)

Table 3. Attitude towards E-Banking System

S/N	Item Description	SD (%)	D (%)	Nu (%)	A (%)	SA (%)	$\overline{X}$	S. Dev.	Rank
1	I feel comfortable using e-banking services independently.	7 (14.9)	16 (34.0)	4 (8.5)	16 (34.0)	4 (8.5)	2.87	1.27	9
2	I trust e-banking services for financial transactions.	1 (2.1)	10 (21.3)	2 (4.3)	20 (42.6)	14 (29.8)	3.77	1.16	7
3	I believe e-banking is a reliable alternative to traditional banking	2 (4.3)	5 (10.6)	0 (0.0)	22 (46.8)	18 (38.3)	4.04	1.10	5
4	I am willing to adopt e-banking services despite accessibility challenges	0 (0.0)	4 (8.5)	1 (2.1)	24 (51.1)	18 (38.3)	4.19	.85	3
5	I have stopped using an e-banking service due to accessibility issues	1 (2.1)	8 (17.0)	2 (4.3)	30 (63.8)	6 (12.8)	3.68	.98	8
6	I would recommend e-banking services to other users with visual impairment.	9 (19.1)	20 (42.6)	2 (4.3)	14 (29.8)	2 (4.3)	2.57	1.22	10
7	My experience with e-banking has been positive overall.	3 (6.4)	2 (4.3)	1 (2.1)	21 (44.7)	20 (42.6)	4.13	1.09	4
8	I believe banks should conduct more awareness campaigns on e-banking for users with visual impairment.	2 (4.3)	7 (14.9)	2 (4.3)	21 (44.7)	15 (31.9)	3.85	1.16	6
9	I would like to receive more training to enhance my e-banking skills	1 (2.1)	2 (4.3)	2 (4.3)	12 (25.5)	30 (63.8)	4.45	.92	2
10	I believe banks should offer personalized training for users with visual impairment.	1 (2.1)	1 (2.1)	0 (0.0)	17 (36.2)	28 (59.6)	4.49	.80	1
	N=47, Average mean= 3.80, Weighted mean=3.00						3.80	1.05	

Source: Author's Field Survey, 2025
Key; Strongly Agree (SA=4), Agree (A=3), Disagree (D=2), Strongly Disagree(SD=1)

Table 4. Accessibility of E-Banking System Scale

S/N	Item Description	SD (%)	D (%)	Un(%)	A (%)	SA (%)	$\overline{X}$	S. Dev.	Rank
1	E-banking platforms are accessible for users with visual impairment.	3 (6.4)	4 (8.5)	5 (10.6)	28 (59.6)	7 (14.9)	3.68	1.04	7
2	I find e-banking applications easy to use.	0 (0.0)	6 (12.8)	3 (6.4)	21 (44.7)	17 (36.2)	4.04	.97	2
3	E-banking platforms provide sufficient accessibility features for users with visual impairment.	2 (4.3)	12 (25.5)	0 (0.0)	24 (51.1)	9 (19.1)	3.55	1.19	8
4	My bank provides adequate support for users with visual impairment	6 (12.8)	15 (31.9)	3 (6.4)	14 (29.8)	9 (19.1)	3.11	1.38	9
5	I have experienced difficulties accessing e-banking services due to poor accessibility features.	2 (4.3)	5 (10.6)	1 (2.1)	26 (55.3)	13 (27.7)	3.91	1.06	4
6	E-banking applications are compatible with screen readers and other assistive technologies.	1 (2.1)	8 (17.0)	2 (4.3)	22 (46.8)	14 (29.8)	3.85	1.10	5
7	I feel secure while using e-banking services.	1 (2.1)	5 (10.6)	2 (4.3)	25 (53.2)	14 (29.8)	3.98	.98	3
8	Navigation within e-banking platforms is intuitive and user-friendly	1 (2.1)	5 (10.6)	3 (6.4)	31 (66.0)	7 (14.0)	3.81	.90	6
9	Banks should improve the accessibility features of e-banking platforms.	1 (2.1)	2 (4.3)	1 (2.1)	18 (38.3)	25 (53.2)	4.36	.89	1
	N=47, Average mean= 3.81, Weighted mean=3.00						3.81	1.056	

Source: Author's Field Survey, 2025
Key; Strongly Agree (SA=4), Agree (A=3), Disagree (D=2), Strongly Disagree(SD=1)

Research question three: What accessibility features are available on e-banking systems for persons with visual impairments in Oyo State?

Table 4 presents respondents' perceptions regarding the accessibility of e-banking systems. The findings showed mixed experiences regarding accessibility and usability. Most respondents, 43 (91.5%), agreed that banks should improve accessibility features on e-banking platforms (Mean = 4.36, SD = 0.89), indicating a strong perceived need for more inclusive digital banking systems.

Furthermore, 38 (80.9%) respondents agreed that they found e-banking applications easy to use (Mean = 4.04, SD = 0.97), while 39 (82.0%) respondents reported feeling secure while using e-banking services (Mean = 3.98, SD = 0.98). Respondents also indicated moderate agreement that e-banking applications were compatible with screen readers and assistive technologies (Mean = 3.85, SD = 1.10).

However, significant accessibility concerns were also identified. About 39 (82.0%) respondents agreed that they had experienced difficulties accessing e-banking services due to poor accessibility features (Mean = 3.91, SD = 1.06). In addition, respondents expressed concerns regarding inadequate institutional support for users with visual impairment (Mean = 3.11, SD = 1.38).

The findings therefore suggest that although some accessibility features are available on e-banking platforms, substantial usability and accessibility challenges persist for users with visual impairment. The overall weighted mean of 3.81, which is greater than the criterion mean of 3.00, indicates a moderate level of accessibility of e-banking systems in Oyo State.

Research question four: What is the relationship between users with visual impairment regarding the accessibility and usability of e-banking platforms?

Table 5 showed that there was a significant relationship between users with visual impairment regarding the accessibility and usability of e-banking platforms (r = .703, N= 47, p<.05). The mean for Usability of e-banking platforms were obtained as 38.04 and Standard deviation 5.13. Further, the mean and standard deviation for Accessibility were obtained as 34.30 and 5.24 respectively. Although, the result confirms that a positive relationship exists between them, such a relationship is significant one. This implies that there was a significant relationship between users with visual impairment regarding the accessibility and usability of e-banking platforms. Zarmpou et al. (2012) found that perceived usability and trust strongly influence users' acceptance of mobile services and digital platforms. This supports the present finding that improved accessibility features may enhance users' confidence, independent usage, and acceptance of e-banking technologies.

Table 5. Result of PPMC showing the Significant Relationship between users with visual impairment regarding the accessibility and usability of e-banking platforms

Variable	Mean	Std. Dev.	N	R	P	Remark
Usability of e-banking platforms	38.04	5.13	47	.703**	.000	Sig.
Accessibility	34.30	5.24				

Source: Field survey, 2025
Correlation is significant at the 0.05 level (2-tailed).

DISCUSSION

The findings of this study revealed that users with visual impairment in Oyo State demonstrated high awareness of e-banking services. However, despite this awareness, respondents reported limited practical training, accessibility challenges, and concerns regarding independent and secure usage of e-banking systems. The study also established a significant relationship between accessibility and usability of e-banking platforms,

suggesting that accessibility features strongly influence users' experiences and attitudes toward digital banking.

Level of Knowledge of Users with Visual Impairment on E-Banking Systems

The findings showed that most respondents were aware of e-banking services and familiar with common platforms such as mobile banking, internet banking, ATM services, and USSD banking. This may be attributed to the increasing digitization of banking services and widespread public awareness of electronic financial transactions in Nigeria. However, although awareness was high, respondents reported low participation in formal training and limited operational knowledge regarding independent navigation, transaction verification, and security procedures. This finding suggests a gap between general awareness and practical competence in the use of e-banking systems.

The low level of training observed in this study is important because awareness alone may not guarantee effective or secure usage of e-banking services among users with visual impairment. Many respondents indicated that they encountered challenges while learning to use e-banking applications independently. This implies that users may know about the existence of digital banking services but still lack the technical skills required to use them safely and efficiently. The finding supports Zarmpou et al. (2012) who reported that users with visual impairment in Nigeria are often aware of digital banking services but lack adequate practical training on accessibility features and security procedures.

The findings further revealed concerns relating to security and financial privacy. Many users with visual impairment may depend on relatives, friends, or third parties to complete transactions when banking applications are inaccessible or incompatible with screen readers. Such dependence may expose users to risks of fraud, unauthorized access, disclosure of PINs, one-time passwords (OTP), and transaction details. This finding extends beyond earlier studies such as Hassan et al, (2020), which mainly focused on accessibility barriers without critically examining the implications of dependence on third parties for financial privacy and security.

These findings align with Technology Acceptance Model (TAM), which suggests that although users may perceive e-banking as useful, limited training and accessibility challenges reduce perceived ease of use, thereby affecting confidence in independent usage. Similarly, the concept of digital financial inclusion emphasizes that access to financial services should not only involve availability of services but also the ability to use them independently and securely.

Perceptions of Users with Visual Impairment on E-Banking Systems

The study found that respondents perceived e-banking as convenient and beneficial, because it reduces the need for physical visits to banking halls. Nevertheless, respondents also expressed concerns regarding accessibility, usability, and transaction security. Difficulties relating to screen reader compatibility, navigation complexity, inadequate audio feedback, and inaccessible interface designs negatively shaped users' perceptions of e-banking systems.

Unlike some previous studies that broadly concluded that users with disabilities perceive e-banking positively, the present study demonstrates that positive perceptions are conditional upon accessibility and usability experiences. Respondents who experienced difficulty navigating applications or verifying transactions independently were more likely to express distrust and discomfort toward e-banking systems. This shows that accessibility is not merely a technical feature but a determinant of user confidence and trust.

The findings also revealed that transaction security remains a major concern among users with visual impairment in Oyo State. Some respondents expressed fear of making mistakes during transactions due to inability to independently verify account details, OTP messages, transaction prompts, and confirmation notifications. This creates anxiety regarding fraud and financial loss. Hassan et al, (2020) similarly observed that inaccessible banking interfaces often undermine the confidence of users with visual impairment. However, this present study contributes further by demonstrating how accessibility limitations may indirectly increase dependence on others and compromise users' financial autonomy and privacy.

Attitudes of Users with Visual Impairment Towards E-Banking Systems

The findings showed that respondents generally had positive attitudes toward e-banking and were willing to continue using digital banking services despite existing challenges. Many respondents acknowledged that e-banking offers convenience, flexibility, and financial independence. However, respondents also expressed discomfort regarding independent use of e-banking platforms, when accessibility barriers made transaction processes difficult to complete without assistance.

An important finding from this study is that although respondents were willing to adopt e-banking services, many were reluctant to recommend such services to other users with visual impairment. This suggests that respondents' experiences with accessibility barriers, inconsistent support services, and security concerns may have reduced their confidence in the reliability of current e-banking systems. The low willingness to recommend e-banking may therefore be interpreted as an indication of dissatisfaction with the overall user experience rather than rejection of digital banking itself. Singhal and Padhmanabhan (2009) reported that convenience, accessibility, and perceived security significantly influence customers' perception of internet banking services. This finding further explains why accessibility barriers and security concerns shaped the perceptions and attitudes of users with visual impairment toward e-banking platforms in Oyo State.

The findings further showed that respondents strongly desired more personalized training and accessibility support from financial institutions. This suggests that users with visual impairment are not resistant to technology adoption; rather, their attitudes are influenced by the extent to which e-banking systems accommodate their accessibility needs. This finding aligns with Abilu et al, (2025), that reported how environmental factors, inaccessible tools, inadequate training, create barriers for persons with visual impairment. It also aligns with the Unified Theory of Acceptance and Use of Technology (UTAUT), the concept of facilitating conditions, which explains that users are more likely to adopt technology when adequate support systems and accessible infrastructure are available.

CONCLUSION AND IMPLICATIONS

This study examined the knowledge, perception, and attitudes of users with visual impairment toward e-banking

systems in Oyo State, Nigeria. The findings revealed that although respondents demonstrated high awareness of e-banking services and familiarity with platforms such as mobile banking, ATM, internet banking, and USSD services, there remains a gap between awareness and practical competence. Many respondents reported limited training opportunities and difficulties using e-banking platforms independently, indicating that awareness alone does not guarantee effective and secure use of digital banking services.

The study further showed that accessibility barriers such as poor screen reader compatibility, complex navigation, inadequate audio feedback, and difficulties in verifying transactions independently continue to affect users' experiences. Concerns relating to transaction security, privacy, fraud, OTP verification, and dependence on third parties also influenced users' confidence and attitudes toward e-banking. However, respondents generally expressed positive attitudes toward e-banking and recognized its convenience and potential to enhance financial independence.

In addition, the study established a significant relationship between accessibility and usability of e-banking platforms. This study contributes to the discourse on digital financial inclusion by highlighting the need for accessible, secure, and user-friendly e-banking systems for persons with visual impairment in Oyo State, Nigeria. The United Nations (2022) emphasized that inclusive financial technologies are necessary for reducing barriers experienced by persons with disabilities and promoting equal participation in digital economies. The findings of this study reinforce the need for accessible and secure e-banking systems that support independent financial transactions for users with visual impairment.

Recommendations

Based on the findings of this study, the following recommendations were made:

Banks should improve the accessibility of their e-banking platforms by ensuring compatibility with screen readers, voice commands, and high-contrast user interfaces.

Furthermore, Financial institutions should conduct workshops and awareness campaigns specifically designed for users with visual impairment to improve their knowledge of e-banking functionalities. Training and Digital Literacy Programs Financial institutions should organize specialized training programs tailored for persons with visual impairment to improve their digital banking skills and confidence.

Regulatory bodies such as the Central Bank of Nigeria (CBN) should implement policies mandating financial institutions to adopt accessibility standards in digital banking services.

Banks should establish dedicated support services for users with visual impairment, including personalized assistance, braille manuals, and audio-guided transaction confirmations. Stakeholders should launch advocacy and awareness initiatives to educate both visually impaired individuals and the general public on the benefits and accessibility options of e-banking services.

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Conflicts of Interest / Competing Interests
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethics Approval
Ethical approval for this study was obtained from the appropriate institutional review board/ethics committee. The study adhered to standard ethical guidelines for research involving human participants.

Consent to Participate
Informed consent was obtained from all participants involved in the study. Participants were adequately informed about the purpose of the research, and their participation was voluntary.

Consent for Publication
Not applicable.

Availability of Data and Materials
The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Artificial Intelligence-Assisted Technology
The authors declare that no artificial intelligence tools were used in the design, data collection, or analysis of this study. However, AI-assisted tools (e.g., language editing tools) may have been used to improve the clarity and readability of the manuscript without affecting the intellectual content.

Code Availability
Not applicable.

Authors Contribution
Jamal Abioye ADIO conceptualized the study, designed the methodology, carried out data collection, contributed to the methodology, performed the initial analysis, data analysis and interpretation of findings and drafted the original manuscript. He also served as the corresponding author and coordinated all aspects of the manuscript submission and revision process.

Sunday Abimbola ABODUNRIN supervised the research, contributed to the study design, and critically reviewed and revised the manuscript for important intellectual content.

Rasheed Adekunle ABILU contributed to literature writing, research design, data analysis, interpretation of results, and manuscript editing.

All authors read and approved the final version of the manuscript.

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ADDITIONAL INFORMATION

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