TECHNOLOGY EXCLUSION: IMPACT ON FEMALE COUNSELLORS' PARTICIPATION IN CROSS RIVER STATE, NIGERIA

Linda E. Ndome, Enemadukwu D. Ameh,Chukwu O. Chinedu, and Deborah A. Imojara

Department of Guidance and Counselling, University of Calabar, Calabar.
Email: ndomelinda2017@gmail.com, +2348130488032

Abstract

Technology exclusion is the inability to effectively use technology, often affecting women, especially those in rural or disadvantaged areas, and can exacerbate existing social and economic inequalities. The purpose of this study was to investigate the level of technology exclusion and how it predicts female counsellors' level of participation. To achieve this, three (3) objectives, three (3) research questions and two (2) hypotheses were formulated to guide the study. Descriptive research design was adopted for the study. One hundred and fifty-two (152) female counsellors selected from both urban and rural Secondary Schools were used. The selection was done through the stratified and simple random sampling technique. The instrument used for data collection was titled "Technology Exclusion and Female counsellors Participation Questionnaire (TE-FCPQ)". The reliability was established through the Cronbach Alpha method. The reliability coefficient Cronbach's ranged from 0.86 - 0.89. The quantitative data were analyzed using descriptive statistics, one-sample t-tests, and multiple regression via SPSS v23, while qualitative data were thematically analyzed using NVivo and Braun and Clarke's (2006) six-phase model. Each hypothesis was tested at .05 level of significance. The result of the analysis revealed among others that, the level female counsellors' exclusion from technology is significantly higher than the baseline mean and technology exclusion of female counsellors significantly contributes to their participation. Based on the findings, it was recommended among others, that government should build a supportive environment for female counsellors through professional development program, mentorship and guidance services to increase their participation in technology usage.

***Keywords**:* technology, exclusion, female counsellors, and participation

Introduction

In today's rapidly evolving digital world, technology plays a crucial role in how professionals connect, learn, and work. For counsellors, especially, tools like Zoom, Google Meet, online training platforms, and digital record-keeping have become essential. However, not everyone has equal access to these tools. Many female counsellors, especially in developing countries, are left out due to poor internet, lack of digital devices, or limited skills in using them (UNESCO, 2022). This digital divide creates a wall that blocks them from fully participating in their profession. Technology has significantly impacted various professions, including counselling, with many women in Nigeria, especially in urban low-income areas, being left behind due to limited access to digital tools and platforms (Adeleke & Adebayo, 2021). Also, despite these cities like Lagos, Abuja, and Port Harcourt having more technological infrastructure, high device costs, poor internet connectivity, and socio-economic barriers continue to exclude many women from full participation in counselling.

For example, a female counsellor in a rural area may want to attend an online mental health training, but without a laptop or stable internet, she's unable to join. Meanwhile, her male colleagues in urban areas with access to better technology continue to grow professionally.

This inequality is not just about tools; it's about missed opportunities for women to learn, grow, and help more people. According to the International Telecommunication Union (2021), women are 17% less likely than men to use mobile internet in low- and middle-income countries. Technology exclusion refers to the inability to access, afford, or use digital devices and internet services for professional practice. In Nigerian urban settings, female counsellors often lack personal computers, smartphones, or stable internet, limiting their ability to attend online counselling webinars, certification programs, and virtual conferences (Oladipo et al., 2020). This disadvantage is more pronounced among women compared to their male counterparts, who have more financial control and fewer domestic responsibilities.

The problem goes beyond access; it also includes confidence. Some female counsellors may have smartphones or computers, but they may not feel confident using online platforms or digital tools. This fear of "not knowing enough" can stop them from speaking up in virtual meetings or applying for tech-based roles (Wamala, 2020). Without training and support, their voices are not heard in important discussions that shape mental health services. Digital literacy is a growing concern, with female counsellors often lacking confidence in using technology to fully engage in online opportunities. For instance, in urban Kano, a counsellor may not know how to navigate virtual platforms like Zoom or Google Classroom (Eze & Olamide, 2022; Wamala, 2020). Without adequate training and institutional support, these women are often excluded from professional discussions, leadership opportunities, and policy dialogues.

Also, workplaces and governments often fail to support female counsellors in catching up with technology. While some organizations provide digital resources, many do not adequately address the unique challenges women face, such as juggling family duties, overcoming cultural barriers, or having limited time to learn new tech skills. As a result, women fall further behind, and the counselling profession loses valuable input from half its workforce (World Bank, 2023). Another issue is that institutional neglect in Nigeria's counselling and educational institutions is a significant issue, as they often overlook the gender-specific challenges faced by women professionals, leading to underrepresentation of their voices in national counselling forums and mental health policymaking, particularly during crises like the COVID-19 pandemic (Nwankwo et al., 2021). This study aims to explore how technology exclusion affects the participation of female Counsellors. It will look into the level of female counsellors' exclusion from technology, the extent to which female counsellors access technology, female counsellors' digital skills, challenges faced by female counselors and the possible solutions to bridge the gap. By highlighting real experiences and patterns, this research hopes to raise awareness and push for action that ensures all counsellors, regardless of gender, have equal access to digital tools and opportunities.

Statement of the Problem

Despite the rapid integration of 'digital technologies into Counselling practice and professional development globally, many female counsellors in Nigeria, especially in urban low-income and underserved areas, continue to face significant barriers to digital inclusion. These barriers include limited access to devices, unstable internet connectivity, low digital literacy, and minimal institutional support. As a result, their ability to participate in virtual counselling sessions, online training programs, and decision-making forums is severely restricted. This technological gap not only limits their professional growth and visibility but also undermines the broader goal of inclusive and gender-balanced mental health service delivery. While efforts to promote ICT in education and health sectors have grown, little empirical attention has been given to how technology exclusion specifically affects the

engagement and advancement of female counsellors. The lack of data and policy responses to this issue further deepens the digital divide and perpetuates gender inequalities in the counselling profession. Therefore, there is an urgent need to investigate the extent and nature of technology exclusion among female counsellors and how it impacts their participation in professional practice, training, and leadership spaces. Understanding these challenges is key to designing inclusive policies and interventions that ensure no one is left behind in the digital transformation of mental health services.

Objective of the Study

This study aims to explore how technology exclusion affects the participation of female counsellors. It will look into the level of female counsellors' exclusion from technology, access to technology, digital skills in technology and the challenges that impact women's participation in technology.

Research Questions

1. What is the level of female counsellors' exclusion from technology?
2. To what extent does female counsellors' access to technology contribute to their participation?
3. To what extent do female counsellors' digital skills in technology contribute to their participation?
4. What are the challenges that impact women's participation in technology?

Hypothesis

1. The level of female counsellors' exclusion from technology is not significantly high than the baseline means.
2. Female counsellors' access to technology does not significantly contribute to their participation.
3. Female counsellors' digital skills in technology do not significantly contribute to their participation.

Literature Review

The Level of Exclusion of Women from Technology

Despite the widespread benefits of ICTs, access to these technologies remains uneven, and many individuals, particularly women, are left behind (Boutilier, 2019; Cummings & O'Neil, 2015). This inequality highlights the persistent "digital divide," which limits the ability of disadvantaged groups to benefit from digital advancements (Ragnedda & Mutsvairo, 2020). For women, especially in low- and middle-income countries, this divide significantly affects their economic opportunities, particularly their integration into the formal workforce (Alozie & Akpan-Obong, 2017; McKinsey Global Institute, 2015). For example, Ragnedda and Mutsvairo (2020) also found that access to technology alone did not foster labour force participation for single women in the U.S., despite them representing a considerable share of the population. Similarly, Cummings and O'Neil, (2015) noted that although women increased their use of digital tools, it did not translate into higher employment levels, except in certain professional sectors. In Africa, the gender gap in access to digital tools remains substantial, which further widens economic disparities between men and women (Fabrizio et al., 2020).

Other studies, such as those by Jiang and Luh (2017) and Antonio and Tuffley (2014), also show that women in many developing nations, including African countries, are significantly less likely than men to have access to technology, limiting their visibility and participation in

the labour market categorized into two areas. The first emphasizes the potential of digital technologies to improve women's access to labour markets by making employment opportunities more visible, flexible, and inclusive. For instance, ICTs (Information and Communication Technologies) can help women connect with jobs more easily, reduce barriers to remote or part-time work, and enable employers to discover untapped female talent (Hafeez et al, 2020; Nikulin, 2017). Access to job-related information online enhances the job search process and improves women's chances of securing employment (Raja et al., 2013). In the United States, Dettling (2017) found that broadband access significantly increased workforce participation among married women, though the same effect was not observed for single women. Similarly, in low- and middle-income countries, evidence suggests that increased internet and mobile phone penetration have a strong positive influence on women's employment participation. Omotoso and Obembe (2016) and Nikulin (2017) observed such outcomes in developing economies, while Watson et al. (2018) confirmed similar patterns in the Indo-Pacific region. In sub-Saharan Africa, research by Nkoumou and Song (2021) showed that ICT availability has enhanced women's involvement in the labour force. These findings are consistent with other studies from Africa and Asia, including those by Mainuddin et al. (2015), Ejobi, Tanamkem, and Asongu (2018), and Asongu and Odhiambo (2020), all of which point to the critical role digital technologies play in promoting women's economic inclusion.

Access to Technology and Participation

A study carried out by Tahmasebi (2023) investigated the digital divide in rural communities, focusing on socioeconomic, educational, and infrastructural factors. It used semi-structured interviews with 20 participants to understand their experiences with digital access and usage. The findings revealed that economic barriers, inadequate educational resources, and insufficient infrastructure significantly hinder digital access in rural areas. Economic challenges include device affordability, while educational barriers include digital literacy programs and reliance on schools. Infrastructure issues, such as internet connectivity and reliability, exacerbate the digital divide. The study emphasizes the need for tailored financial and educational services to support rural communities. Bridging the digital divide requires a multifaceted approach that addresses these barriers. Targeted policy interventions and stakeholder collaboration are crucial for enhancing digital inclusion and ensuring equitable access to technology. The findings emphasize the need for comprehensive strategies that go beyond improving connectivity to foster meaningful digital engagement and utilization (Chen et al., 2021; Esteban-Navarro et al., 2020; Freeman et al., 2022; Fu et al., 2023).

In a related study by Chan et al. (2022), conducted telephone interviews with a random sample of 1018 older adults in Hong Kong from January to July 2021 (This research has received funding support from the Interdisciplinary Research Matching Scheme, Hong Kong Baptist University). We found that only 76.5% of the participants had Internet access at home, a mobile phone data plan, or both, whereas 36.3% had never used Internet services and 18.2% had no digital devices. A younger age, male gender, higher education level, living with others, and higher self-perceived social class were associated with material access to digital devices and everyday use of Internet services. Participants who accessed the Internet every day had higher levels of life satisfaction and self-rated physical and mental health than those who rarely or never used the Internet. Hierarchical multiple regression analysis revealed that digital skills were significantly associated with self-rated mental health even when controlling for demographic variables (including age, gender, education level, and self-perceived social class).

Existing literature consistently highlights that technology exclusion, particularly the digital gender divide, significantly hinders women's participation in professional and educational sectors, including counselling. Studies from Nigeria and other developing regions show that women often face barriers such as limited access to ICT tools, low digital literacy, cultural norms, and inadequate policy support (Adeleke & Adebayo, 2021; Wamala, 2020; Antonio & Tuffley, 2014). These factors limit their visibility, job performance, and access to digital opportunities. Despite the transformative potential of ICTs to promote inclusivity, research by Asongu and Odhiambo (2020) and reports from UNESCO (2022) and the ITU (2021) emphasize that systemic inequalities continue to persist. Addressing these disparities requires targeted interventions, including affordable digital access, inclusive policies, and tailored digital skill programs for women professionals.

Digital Skills in Technology and Participation

A study carried out by Sung (2018) investigated the impact of motivation on digital literacy, focusing on the cumulative and recursive model of digital access and its causal path to digital usage. The analysis uses data from the National Information Society Agency's 'digital divide index and actual survey' and employs structural equation analysis and SPSS 23 and Amos 23 statistics programs. Results indicate that motivation significantly impacts material, skill, and usage access, suggesting the need for strengthened policies that consider motivation factors in digital literacy. Another study explores the prerequisites for participation, focusing on education. A survey study in Finland revealed perceived obstacles to digital skills and political participation. The concept of digital capital was used to show the mediating effect of digital skills on education and participation. The study breaks down digital skills into operational, information, navigation, social, creative, and mobile skills. Operational skills were found to be the most significant mediator between education and political participation on social media (Lybeck et al., 2024). The study suggests that digital capital can help overcome digital divides by transforming other forms of capital into digital capital and vice versa, particularly political capital.

A recent quantitative study conducted at Sule Lamido University, Kaffin Hausa, Jigawa State, Nigeria, employed a convenience sampling method to assess students' digital competencies and awareness of digital technologies. The survey, which included 321 participants, revealed that students demonstrated notable proficiency in owning and using digital devices. The findings also indicated a substantial level of cybersecurity awareness and sensitivity to digital threats. Moreover, students recognized the relevance of essential digital skills particularly in managing digital content and effectively using communication and collaboration tools like Zoom and Moodle for academic purposes (Abdullahi et al., 2023). A study using data from the 2017 Chinese General Social Survey ($N = 1,204$) employed structural equation modeling (SEM) via AMOS 26.0 to investigate the determinants of digital participation, focusing on digital skills, online interpersonal communication, and online immersion. Findings revealed that digital skills significantly enhanced digital participation both directly and indirectly through the mediating effects of online interpersonal communication and immersive online experiences. Notably, these mediating factors were crucial in explaining the pathway between digital skills and digital engagement, an area previously underexplored. Interestingly, income was found to have no significant impact on this relationship, suggesting that in the Chinese context, social and experiential factors may now outweigh economic ones in promoting digital inclusion (Liu et al., 2023).

Several researchers have investigated strategies for enhancing digital participation and fostering individuals' willingness to engage. Smorgunov and Ignatjeva (2021) found that the

use of digital platforms was primarily influenced by their affordability rather than their efficiency or security, while trust in institutions was more strongly associated with efficiency and security features. The concept of digital political participation has emerged from studies linking digital engagement with political involvement (De Marco et al., 2014). The increasing ubiquity of the Internet has significantly transformed modern governance structures, offering the potential to reshape entire systems of governance (Luna-Reyes, 2017). Digital political participation has also been shown to influence online activism, with digital media activities proving to be highly engaging and reflective of users' levels of involvement (Lee & Chan, 2016). Moreover, digital platforms contribute to mobilization efforts, the formation of collective identities, and organizational change (Mercea, 2012). On a broader scale, digital engagement has been credited with advancing sustainable development and fostering the emergence of "smart sustainable cities" (Bouzguenda et al., 2019). Despite this growing body of research, most existing studies have concentrated on specific groups, political engagement, or digital inequality. There remains a lack of in-depth inquiry into how digital participation can be broadly improved, particularly regarding the potential mediating effects of interpersonal communication and frequency of online use. This study seeks to address that gap by identifying key factors that influence digital participation and examining whether interpersonal communication and online activity duration play mediating roles.

The Challenges of Female Counsellors' Participation in Technology

Research evidence highlights that women professionals, including counsellors, face a range of obstacles in effectively accessing and using digital technologies. For example, Eze and Olamide (2022) conducted a study among female educators in urban areas of Nigeria and found that their digital engagement was hindered by inadequate institutional backing, insufficient opportunities for professional development, and prevailing gender expectations, which restricted their ability to apply technology in their professional settings. Antonio and Tuffley (2014) also examined gender inequalities in ICT usage across developing countries and observed that women often lacked the economic means, educational qualifications, and time due to household responsibilities to actively participate in digital environments. Jiang and Luh (2017), using national survey data, revealed that women from economically disadvantaged regions had notably lower access to internet services and digital literacy programs, especially in fields traditionally occupied by women, such as teaching and counselling. In a regional study, Alozie and Akpan-Obong (2017) explored the experiences of female ICT practitioners in sub-Saharan Africa and found that cultural stereotypes and systemic gender barriers prevented women from actively participating and advancing in tech-driven roles, despite improvements in ICT infrastructure.

Further insights from Nigeria come from Aina and Adebayo (2021), who interviewed 60 female school counsellors across multiple states and reported that limited access to ICT tools, lack of adequate training, and minimal support from educational institutions significantly hampered their ability to integrate digital technology into counselling practices. Although the counsellors expressed willingness to adopt digital platforms for their work, they lacked the requisite skills and support systems. On a global scale, the McKinsey Global Institute (2015) emphasized that bridging the gender digital divide could substantially boost global economic productivity, yet women continue to be underrepresented in digital training and decision-making spaces. In alignment, Fabrizio et al. (2020) underscored how African women professionals face exclusion from digital initiatives due to infrastructural challenges and deep-rooted social norms.

Also, García-Vázquez's (2025) study examined the use of virtual therapy for vulnerable women, focusing on its benefits and challenges in providing psychosocial care using ICTs. A systematic review of 204 studies identified 16 that met the inclusion criteria. Key challenges include diverse participant representation and addressing data privacy, technology access, and internet and energy inequalities. Benefits include improved health, increased social participation, reduced isolation, better decision-making, and fewer healthcare visits. However, a preference is still for combining these technologies with face-to-face counselling. The study suggests that integrating clinical social work approaches could enhance the effectiveness of these technologies. Addressing these challenges is crucial to fully utilize the potential of these technologies in psychosocial care.

Taken together, these empirical findings reveal that female counsellors face multi-dimensional challenges ranging from technical and educational to institutional and cultural that limit their participation in digital spaces. This suggests the need for inclusive digital policies, targeted training programs, and supportive environments that enable female counsellors to thrive in technology-integrated professional contexts.

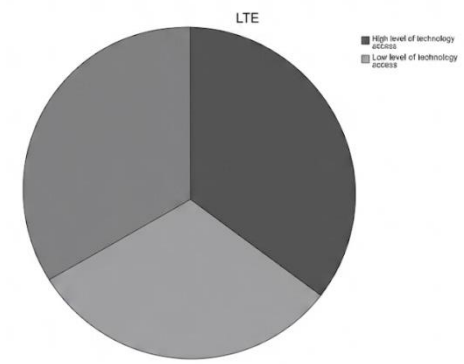
Methodology

This study adopted a descriptive design to explore how technology exclusion contributes to the participation of female counsellors in Cross River State, Nigeria. The research was conducted in Cross River State, targeting registered female counsellors in schools, NGOs, and mental health institutions. A total of 300 participants were selected for the study using stratified random sampling. A structured questionnaire titled Technology Exclusion and Participation (TEP-PQ) (entering access to technology, digital skills, participation, and barriers). The instrument was made up of a total of 22 items measured on the 4-point scale of strongly agreed, agree, disagree and strongly disagree, (exploring the possible challenges that contribute to women's participation in technology exclusion) was used to collect data. Instruments were validated by three experts, and pilot tested yielding a Cronbach's alpha ranging from 0.86 - 0.89. The quantitative data were analyzed using descriptive statistics, one-sample t-tests, and multiple regression via SPSS v23, while qualitative data were thematically analyzed using NVivo and Braun and Clarke's (2006) six-phase model. Ethical clearance was obtained, and all participants gave informed consent in compliance with the Nigerian Research Ethics Code and the Helsinki Declaration. This design enabled the study to comprehensively examine both the scope and depth of technology-related exclusion among female counsellors and its implications for their professional engagement. All hypothesis was tested at 0.5 level of significance.

Presentation of Results

Research Questions One

What is the level of female counsellors' exclusion from technology?



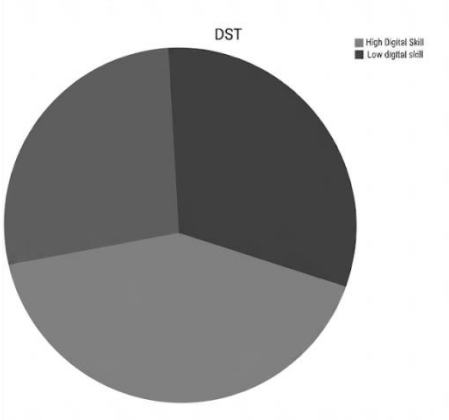
From Figure 1, it is evident that 105, is 35.0% respondents, have a low level of female counsellors' exclusion from technology, while 195, is 65.0% respondents, indicated that they have a high level of female counsellors' exclusion from technology. The figure below shows that the level of female counsellors' exclusion from technology is high.

Research Question Two

To what extent does female counsellors' access to technology contribute to their participation?

Figure2

Extent to Which Female Counsellors' Access to Technology Contributes to Their Participation



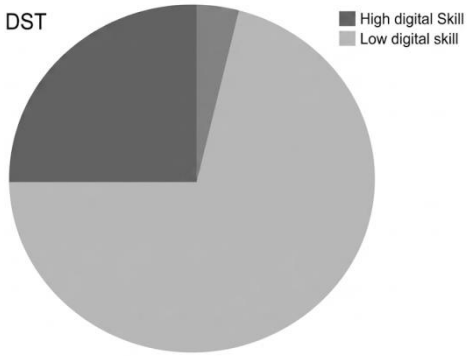
From Figure 2, it is evident that 100, that is, 33.3% of the respondents, respond that they have high access to technology that contributed to their participation, while 200, that is, 66.7% of the respondents, respond that they have low access to technology that contributed to their participation. The results show that female counsellors' access to technology contribution to their participation is low.

Research Question Three

To what extent do female counsellors' digital skills in technology contribute to their participation?

Figure 3

Extent to Which Female Counsellors' Digital Skills Contributes to Their Participation



From Figure 3, it is evident that 92, that is, 30.7% of the respondents, respond that they have high digital skills that contributed to their participation, while 208, that is, 69.3% of the respondents, respond that they have low digital skills that contributed to their participation. The results show that female counsellors' digital skills contribution to their participation is low.

Research Question Four

What are the challenges that impact women's participation in technology?

To provide an answer to research question four, frequency and percentages were used. The result is presented in Table 1. The results in Table 1 present key challenges from the spectacles of female counsellors. The result shows that a greater proportion of Female counsellors (over 50 per cent) indicated that the following constitute barriers in women's participation in technology: (a) Socio-cultural barriers, (b) Limited access to digital tools and infrastructure (c) Educational and skills gap (d) Workplace discrimination and bias (e) Policy and structural limitations (f) Time poverty and competing responsibilities and (e) Psychological and confidence-related barriers.

Table 1: ***Table Showing the Challenges That Impact Women's Participation in Technology***

S/N	Challenges of women's exclusion	Description of the Challenges	Frequency (%)
1	Socio-cultural barriers	Gender stereotypes portray technology as a male domain.	205 (68.33)
2	Limited access to digital tools and infrastructure	Unequal access to devices (computers, smartphones) compared to men and poor internet connectivity in rural or underserved areas	199 (66.33)
3	Educational and skills gap	Lower enrollment of girls in STEM subjects in schools and higher education, limited access to quality digital literacy and ICT training programs and a lack of mentorship and female role models in the technology field.	299 (99.67)
4	Workplace discrimination and bias	Gender bias in recruitment, promotions, and leadership opportunities in tech industries, harassment and hostile work environments, and pay gaps between men and women in technology-related roles	167 (55.67)
5	Policy and structural limitations	Weak implementation of gender-inclusive ICT policies, insufficient funding for women-led tech initiatives and a lack of targeted programs to support women's participation in the digital economy.	257 (85.67)
6	Time poverty and competing responsibilities	Balancing childcare, household duties, and professional development and limited flexibility in tech training schedules or work	191 (63.67)

		arrangements	
7	Psychological and confidence-related barriers	Lower self-confidence in using or mastering technology due to stereotype threat and fear of failure or making mistakes in male-dominated tech spaces	281 (93.67)

Hypothesis One

The level of female counsellors' exclusion from technology is significantly lower than the baseline means. A one-sample t-test was conducted to determine whether the level of female counsellors' exclusion from technology differed significantly from the baseline mean (μ = 15.0). Results in Table 2 show that the level of exclusion from technology was significantly higher than the baseline mean, M = 13.72, SD = 5.42, t (299) = -4.08, p < .001. Therefore, the null hypothesis that female counsellors' level of exclusion from technology is significantly lower than the baseline mean was rejected. These findings indicate that female counsellors' exclusion from technology is higher than expected based on the baseline.

Table 2: ***One-Sample T-Test on the Level of Exclusion from Technology***

Variable	M	SD	T	p	Remark
Exclusion from technology	13.72	5.42	-4.08	<.001	Significantly higher

Test value (μ) = 15.0; df = 299

Hypothesis two

Female counsellors' access to technology does not significantly contribute to their participation. The simple linear regression analysis revealed a statistically significant prediction, F (1, 298) = 575.82, p < .001, though with a very small effect size (adjusted R^2 = .658), meaning access to technology explained only 65.8% of the variance in participation (see Table 3). Thus, the null hypothesis was rejected, implying that positive access to technology is related to higher participation in technology, albeit to a limited extent. The regression equation was:

participation = 10.33 + 1.05 (access to technology) + 0.64 (1)

Hypothesis three

Female counsellors' digital skills in technology do not significantly contribute to their participation. The simple linear regression analysis revealed a statistically significant prediction, F(1, 298) = 720.80, p < .001, though with a very small effect size (adjusted R^2 = .707), meaning digital skills in technology explained only 70.7% of the variance in participation (see Table 3). Thus, the null hypothesis was rejected, implying that positive digital skills in technology are related to higher participation in technology, albeit to a limited extent. The regression equation was:

participation = 13.72 + 1.07 (digital skills in technology) + 0.59 (2)

Table 3: ***Summary of Regression Analyses Examining the Predictive Effects of Access to Technology and Digital Skills, in Technology Does not Significantly Contribute to Their Participation***

Predictor	Outcome	B	B	T	F	P	R2
ATT	PT	1.05	0.44	24.10	575.82	<.001	.658
DST	PT	1.07	0.40	26.84	720.80	<.001	.707

B = unstandardized coefficient; β = standardized coefficient; t = t-test statistic; p = significance level; F = model F-value; R^2 = variance explained; ATT = assess to Technology; DST = Digital Skills in Technology; PT = participation in Technology.

Discussion

The level of female counsellors' exclusion from technology is significantly lower than the baseline means. The study found that the level of female counsellors' exclusion from technology is significantly higher than the baseline means. This study agrees with the findings of research that also reveals that women in many developing nations remain less likely than men to use technology, reducing their labour market participation (Jiang & Luh, 2017; Antonio & Tuffley, 2014). ICTs can improve access to jobs by making opportunities more visible, flexible, and inclusive (Hafeez et al., 2020; Nikulin, 2017), as shown in the U.S. (Dettling, 2017) and across low- and middle-income countries (Omotoso & Obembe, 2016; Watson et al., 2018). In sub-Saharan Africa, ICT access has significantly boosted women's labour force participation (Nkoumou & Song, 2021; Mainuddin et al., 2015; Efobi et al., 2018; Asongu & Odhiambo, 2020).

Female counsellors' access to technology does not significantly contribute to their participation. The study found that Female counsellors' access to technology does significantly contribute to their participation. This study agrees with the findings of research that shows that the digital divide is shaped by economic, educational, and infrastructural barriers that limit access and use of technology, especially in rural and disadvantaged communities (Tahmasebi, 2023). Economic constraints such as device affordability, low digital literacy, and poor connectivity worsen exclusion, requiring targeted policies and multi-stakeholder collaboration to promote meaningful engagement (Chen et al., 2021; Esteban-Navarro et al., 2020; Freeman et al., 2022; Fu et al., 2023).

In Hong Kong, older adults with younger age, male gender, higher education, and better social status were more likely to have digital devices and Internet access, which was linked to higher life satisfaction and better mental health (Chan et al., 2022). In Ghana, ICT access and use in education varied by program of study, with no significant gender difference, and greater use was linked to improved learning outcomes. However, across contexts, particularly in developing regions face persistent digital exclusion due to limited ICT access, low skills, cultural norms, and weak policy support (Adeleke & Adebayo, 2021;Antonio & Tuffley, 2014; Wamala, 2020;). Despite ICT's potential to promote inclusion, systemic inequalities remain, requiring affordable access, inclusive policies, and tailored skills programs (Asongu & Odhiambo, 2020; UNESCO, 2022; ITU, 2021).

Female counsellors' digital skills in technology do not significantly contribute to their participation. The study found that female counsellors' digital skills in technology do significantly contribute to their participation. This study agrees with the findings of studies that highlight multiple factors influencing digital literacy and participation. Motivation plays a key role in shaping material, skill, and usage access, showing the need for policies that address motivational factors in digital literacy (Sung, 2018). Education also impacts participation through digital skills, especially operational skills which act as significant mediators in political engagement on social media (Lybeck et al., 2024). In Nigeria, university students demonstrated strong device ownership, digital skills, and cybersecurity awareness, particularly in managing digital content and using collaboration tools like Zoom and Moodle (Abdullahi et al., 2023). In China, digital skills enhanced participation directly and indirectly through online interpersonal communication and immersive online experiences, while income had no significant effect, suggesting social and experiential factors are more influential (Liu et al., 2023). Affordability influences platform use more than efficiency or security, though trust in institutions relates more to efficiency and security

(Smorgunov & Ignatjeva, 2021). Digital political participation fosters activism, mobilization, collective identity, and sustainable governance (Bouzguenda et al., 2019; De Marco et al., 2014; Lee & Chan, 2016; Luna-Reyes, 2017; Mercea, 2012;). However, gaps remain in understanding how interpersonal communication and online activity duration mediate broader digital participation

What are the challenges that impact women's participation in technology? The result shows that a greater proportion of Female counsellors (over 50 per cent) indicated that the following constitute barriers in women's participation in technology: (a) Socio-cultural barriers, (b) Limited access to digital tools and infrastructure (c) Educational and skills gap (d) Workplace discrimination and bias (e) Policy and structural limitations (f) Time poverty and competing responsibilities and (e) Psychological and confidence-related barriers. This study is in line with the findings of research that shows that women professionals, including counsellors, face intersecting barriers to digital participation. In Nigeria, female educators and counsellors report inadequate institutional support, limited training, and restrictive gender norms that hinder ICT use (Eze & Olamide, 2022; Aina & Adebayo, 2021). Across developing countries, women's engagement is constrained by limited financial resources, education, and time due to household duties (Antonio & Tuffley, 2014), while those in poorer regions have less access to the internet and literacy programs, especially in female-dominated fields (Jiang & Luh, 2017). In sub-Saharan Africa, stereotypes and systemic gender barriers persist despite ICT infrastructure growth (Alozie & Akpan-Obong, 2017). Closing the gender digital divide could boost global productivity (McKinsey Global Institute, 2015), yet African women face continued exclusion due to infrastructure gaps and social norms (Fabrizio et al., 2020). Virtual therapy offers psychosocial benefits but is limited by access, privacy, and infrastructure challenges (García-Vázquez, 2025).

Conclusion

The study reveals that women's participation in technology, particularly within the counselling profession, is constrained by inadequate ICT access, limited digital literacy, and entrenched socio-cultural norms. Overcoming these challenges demands coordinated action at the policy, institutional, and community levels. Expanding access through subsidies, infrastructure investment, and device provision is critical, alongside embedding gender-sensitive ICT training into professional development to bridge skill gaps. By implementing inclusive frameworks that close the gender digital divide, stakeholders can empower female counsellors to fully leverage technology, thereby enhancing professional effectiveness and driving broader socio-economic progress.

Recommendations

1. To enhance women's participation in technology within the counselling profession, stakeholders should prioritize expanding affordable ICT access through infrastructure investment, device subsidies, and reliable internet connectivity.
2. Professional development programs must embed gender-sensitive digital skills training, while public awareness campaigns should challenge socio-cultural norms that limit women's technology engagement.
3. Strengthening digital literacy through both formal education and community initiatives offered with flexible schedules will help bridge skills gaps.
4. Employers can further support adoption by implementing work-life balance policies, and investments in secure, user-friendly virtual counselling platforms will ensure safe and effective service delivery.

5. National and institutional ICT policies should include clear targets for closing the gender digital divide, backed by accountability measures to ensure sustained progress.

References

Abdullahi, M. I., Bello, A. M., & Yusuf, H. A. (2023). Digital skills and awareness of digital skills technologies among students of Sule Lamido University, Kafin Hausa, Nigeria. *Journal of Digital Literacy and Education*, *5*(2), 88–97.10.56471/slujst.v7i.480

Adeleke, A. A., & Adebayo, O. J. (2021). Digital inequality in Nigerian cities: Access, use, and implications for women professionals. *African Journal of Development Studies*, 11(2), 45–56. https://doi.org/10.4314/ajds.v11i2.4

Aina, R. F., & Adebayo, A. M. (2021). ICT use and challenges among Female School counsellors in Nigeria. *Journal of Counselling and Development Studies*, *3*(2), 44–59.

Alozie, N. O., & Akpan-Obong, P. (2017). The digital gender divide: Confronting obstacles to women's development in Africa. *Development Policy Review*, *35*(2), 137–160. https://doi.org/10.1111/dpr.12193

Antonio, A., & Tuffley, D. (2014). The gender digital divide in developing countries. *Future Internet*, *6*(4), 673–687. https://doi.org/10.3390/fi6040673

Asongu, S. A., & Odhiambo, N. M. (2020). Enhancing ICT for inclusive human development in Sub-Saharan Africa. *Technology in Society*, 61, 101249. https://doi.org/10.1016/j.techsoc.2020.101249

Asongu, S. A., & Odhiambo, N. M. (2020). Inequality and gender economic inclusion: The moderating role of ICT and financial access in sub-Saharan Africa. *Telecommunications Policy*, *44*(10), 102000. https://doi.org/10.1016/j.telpol.2020.102000

Boutilier, S. (2019). Women, digital exclusion, and the gender divide: Bridging the ICT gap. *Gender & Development*, *27*(1), 113–130. https://doi.org/10.1080/13552074.2019.1579690

Chan, C. H., Ho, R. S., & Wong, J. P. (2022). Exploring the gray digital divide: Internet access, usage, and well-being among older adults in Hong Kong. *Journal of Aging and Social Policy*, *34*(2), 137–157. https://doi.org/10.1080/08959420.2021.1970000

Chen, Y., Jia, N., Li, W., & Wu, R. (2021). Digital inclusive finance and rural consumption structure - Evidence from peking university digital inclusive financial index and China household finance survey. *China Agricultural Economic Review*. https://doi.org/10.1108/caer-10-2020-0255

Cummings, C., & O'Neil, T. (2015). Do digital information and communication technologies increase the voice and influence of women and girls? Overseas Development Institute (ODI). Finance Survey. China Agricultural Economic Review. https://odi.org/en/publications/do-digital-icts-increase-voice-and-influence-of-women/

Dettling, L. J. (2017). Broadband in the labor market: The impact of residential high-speed internet on married women's labor force participation. *ILR Review*, *70*(2), 451–482. https://doi.org/10.1177/001979316653952

Doe, K., &Amuzu, F. (2023). Access to and use of ICTs in teacher education: A study of student teachers in Hohoe, Ghana. *Journal of Educational Technology in Africa*, *11*(2), 45–59.

Efobi, U. R., Tanankem, B. V., &Asongu, S. A. (2018). Female economic participation with information and communication technology advancement: Evidence from sub-Saharan Africa. *South African Journal of Economics*, *86*(2), 231–246. https://doi.org/10.1111/saje.12185

Esteban-Navarro, M.-Á., García-Madurga, M.-Á., Morte-Nadal, T., & Nogales-Bocio, A. I. (2020). The rural digital divide in the face of the COVID-19 pandemic in Europe: Recommendations from a scoping review. *Informatics*. https://doi.org/10.3390/informatics7040054

Eze, N. R., & Olamide, A. T. (2022). Digital literacy among female educators in urban Nigeria: Gaps and policy implications. *Journal of Education and Technology*, *14*(1), 34–50.

Fabrizio, S., Lopez-Acevedo, G., & Rama, M. (2020). *Africa's Pulse: Women's economic empowerment in sub-Saharan Africa*. World Bank. https://doi.org/10.1596/33649

Fabrizio, S., Malta, V., & Tavares, M. M. (2020). The economic case for narrowing the gender gap. *IMF Working Paper*, WP/20/144.

Freeman, S., Marston, H. R., Ross, C., Morgan, D., Wilson, G., Gates, J., Kolochuk, S., & McAloney, R. (2022). Progress towards enhanced access and use of technology during the Covid-19 pandemic: a need to be mindful of the continued digital divide for many rural and northern communities. *Healthcare Management Forum*. https://doi.org/10.1177/08404704221108314

Fu, L., Zeng, Y., & Kang, X. (2023). Bridging the urban–rural Gap: A qualitative examination of perceived access, barriers, risks and opportunities of children's digital learning during the COVID-19 Pandemic. *Child & Family Social Work*. https://doi.org/10.1111/cfs.13045

Hafeez, M., Memon, Z. A., & Abbasi, A. S. (2020). ICT as an enabler of women's economic empowerment in Pakistan. *Journal of Business Strategies, 14*(1), 55–72.

International Telecommunication Union (ITU). (2021). *Measuring digital development: Facts and figures 2021*. https://www.itu.int/en/ITU-D/Statistics/Pages/facts/default.aspx

International Telecommunication Union. (2021). *Gender digital divide report*.

Jiang, J. J., & Luh, D. B. (2017). Gender inequality in ICT access and use: Evidence from developing countries. *Information Development*, *33*(2), 106–118. https://doi.org/10.1177/02666666916639749

Jiang, J. J., & Luh, D. B. (2017). ICT access inequality and its gender implications in developing countries. *Information Development*, *33*(4), 408–420.

Lybeck, R., Koiranen, I. & Koivula, A. (2024). From digital divide to digital capital: the role of education and digital skills in social media participation. *Univ Access Inf Soc***23**, 1657–1669. https://doi.org/10.1007/s10209-022-00961-0

Mainuddin, A., Begum, A., & Hoque, M. (2015). ICT and women empowerment: Bangladesh perspective. *International Journal of Scientific and Research Publications*, *5*(4), 1–5.

McKinsey Global Institute. (2015). *The power of parity: How advancing women's equality can add $12 trillion to global growth*. https://www.mckinsey.com/featured-insights/employment-and-growth/how-advancing-womens-equality-can-add-12-trillion-to-global-growth

Nikulin, D. (2017). Impact of ICT on employment opportunities for women in developing countries. *Journal of Economic Studies*, *44*(6), 893–910. https://doi.org/10.1108/JES-03-2016-0053

Nkoumou, M. F., & Song, Y. (2021). Digital technologies and female labor force participation in Africa: Evidence and policy recommendations. *African Journal of Science, Technology, Innovation and Development*, *13*(4), 511–522. https://doi.org/10.1080/20421338.2020.1751419

Nwankwo, C. O., Okonkwo, C., & Uchenna, L. M. (2021). The role of counsellors during COVID-19 in Nigeria: Challenges and opportunities for online engagement. *Nigerian Journal of Guidance and Counselling*, *26*(2), 89–104.

Oladipo, S. E., Ojo, M. O., & Akinwale, A. A. (2020). Barriers to digital inclusion among female professionals in Nigerian urban areas. *Gender and Technology Review*, *5*(3), 22–38.

Omotoso, F., &Obembe, O. (2016). The impact of ICT on female labour force participation in Nigeria. *African Development Review*, *28*(3), 354–366. https://doi.org/10.1111/1467-8268.12201

Ragnedda, M., &Mutsvairo, B. (2020). *Mapping the digital divide in Africa: A comparative analysis of ICT access and usage*. Palgrave Macmillan. https://doi.org/10.1007/978-3-030-32706-4

Raja, D. S., Imaizumi, S., & Kelly, T. (2013). *Connecting to work: How ICTs are expanding job opportunities worldwide*. World Bank.

Sung, W. (2018). The empirical study on digital literacy from the viewpoint of digital accessibility.*International Journal of Engineering & Technology*, 7, 137. 10.14419/IJET. v7i3.13.16340.

Tahmasebi, F. (2023). The digital divide: A qualitative study of technology access in rural communities. *AI and Tech in Behavioral and Social Sciences*, *1*(2), 33-39. https://doi.org/10.61838/kman.aitech.1.2.6.

United Nations Educational, Scientific and Cultural Organization. (2022). *Gender and ICTs: A global perspective*. https://unesdoc.unesco.org/ark:/48223/pf0000382154

Wamala, C. (2020). Bridging the digital gender gap in Africa. *African ICT Policy Research Network (Research ICT Africa)*. https://researchictafrica.net/publications/bridging-digital-gender-gap/

Watson, J., McIntyre, D., & Smyth, R. (2018). ICT use and female labor force participation: Evidence from the Indo-Pacific. *Information Technology for Development*, *24*(3), 476–500. https://doi.org/10.1080/02681102.2017.1398781