Key barriers and enablers of women's access to and use of Information and Communication Technologies (ICTs): A desktop review

Sarah Gwayi Tembo[1] and Pilate Chewe[1]

[1] University of Zambia Library, P.O. Box 32379, Lusaka, Zambia

Correspondence Author: Sarah Gwayi Tembo

Received 13 May 2025; Accepted 3 Jul 2025; Published 9 Jul 2025

DOI: https://doi.org/10.64171/JSRD.4.3.16-20

Abstract

Objectives- The main objective of this paper was to examine key barriers and enablers of women's access to and usage of Information and Communication Technologies (ICTs).

Methods- This study employed a desk review approach, analyzing literature focused on the gender digital divide, with particular attention to reliable sources detailing women's access to and use of technology. The review also included case studies of initiatives with both successful and adverse outcomes, and examined strategies that have addressed the associated risks. Using Google Scholar, 25 relevant articles were identified and screened to extract key themes and insights. These themes, aligned with the research objectives, formed the structure for the systematic presentation and discussion of findings.

Results- Literature has shown that women face a number of challenges in their access and use of Information and Communication Technologies. The prominent ones are lack of time, lack of skills, and lack of expertise in ICTs and low income by women. Furthermore, the study has shown that there are various enablers that cause women to use and access ICTs. These include among others computer access at a young age, availability of bursaries and knowledge of family members about the Information Technology careers. Finally, the study has revealed that different organizations globally and scholars have devised strategies to mitigate the digital divide.

Conclusions- This study highlights the critical role of ICTs in enhancing the livelihoods of women and girls. It has revealed both barriers and enablers to women's access to and usage of ICTs. The findings show that while ICTs offer important opportunities, digital divides and gender based challenges continue to impede women's full participation in the digital economy. Case studies from various sectors demonstrated how targeted initiatives can close these gaps and promote women's empowerment, aligning with Sustainable Development Goal number five (5), thereby offering a solid foundation for informing future policies and programs that aim to harness the transformative potential of ICTs in promoting gender equity and sustainable development. The study recommends that stakeholders should urgently address the barriers identified in the literature.

Keywords: Information and Communication Technologies, Access and usage of ICTs, Barriers to ICT access and usage, Enablers to ICT access and usage, Women and girls

1. Introduction

The development and use of Information and Communication Technologies (ICTs) have changed the way people work, interact and the way people go about doing their daily lives. ICTs have emerged as an important tool for enhancing the livelihood of the human race particularly the most vulnerable members of society including women and girls. They provide opportunities for entrepreneurship development through e-Commerce, skills development, improved healthcare service delivery, increased agriculture productivity and the protection of rights by offering a platform for disseminating information as well as reporting any violations among others. In most developing countries such as Zambia, ICTs also play an important role in facilitating financial inclusion especially related to the adoption of mobile money services.

According to the United Nations Asian and Pacific Training Centre for Information and Communication Technology for Development (UN-APCICT) (2011) [17], ICT refers to all technology for creating, manipulating, storing, managing, sending and receiving information. ICT encompasses a wide range of multimedia and communication tools. It can include, but is not limited to, old media such as radio, television and telephone, as well as new media networks (fixed or wireless Internet), hardware (computers, mobile phones, tablets, etc.) and software (social media services, multimedia applications, mobile apps, etc.).

Despite the widespread availability of ICTs globally, these researchers have observed that there is a gender gap in women's access and use of ICTs, preventing them from reaching their full potential. Consequently, this study investigated the key barriers and enablers to women's access to and usage of ICTs.

1.1 Objectives

The main objective of this paper was to examine key barriers and enablers of women's access to and usage of ICTs. In this regard, the paper sought to:

- Explore access to and use of ICTs by women,

- Establish the key barriers to women's access and usage of ICTs, • examine the key enablers of women's access and usage of ICTs,
- Discuss initiatives that aim to close the digital gap.

2. Materials and Methods

This study adopted a desk review methodology which consisted of an in-depth examination of literature related to the gender digital divide. Emphasis was placed on sources that contain reliable information on women's access to and use of technology. The desk review also looked at case studies of programs that had both positive and negative outcomes for women and girls, as well as specific examples of how the risks have been mitigated through other strategies, projects, and activities. This conceptual paper explored the major barriers and enablers to women's participation in ICTs and how these digital tools can be tapped to support the social processes that ultimately empower women and include them in the collective journey towards sustainable development.

Google scholar database was used to search for articles on women's access to and use of ICTs. The literature search retrieved 25 resources, which were later screened to extract unique characteristics and themes of the research. These themes, together with the research objectives formed headings and subheadings to allow for systematic presentation and discussion of the results that are presented in the following section.

3. Findings and Discussion

3.1 Access to and use of ICTs by women

There are many studies which have highlighted the link between women and ICTs**.** As reported by United Nations (UN) (2002) [18] women are increasingly taking advantage of ICTs in all spheres of life, thus confirming that ICT can be a tool to promote gender equality and enhance the economic, political and social empowerment of women. Women have used ICTs such as WhatsApp to empower themselves. An analysis by Abubakar and Dasuki (2018) [1] shows that WhatsApp can contribute to the empowerment of women by enabling their freedom to participate in developmental activities however, some contextual factors impede the ability of the women to take full advantage of these developmental opportunities WhatsApp offers. The paper concludes with some implications for policy makers advancing an agenda for "ICTs for Development".

Another study has also highlighted how ICTs have been empowering women through the use of WhatsApp. The study by Abubakar, Dasuki and Quaye (2017) [2] have mentioned the use of ICTs by women. Women have been using WhatsApp for political participation and transparency. WhatsApp enabled the women to voice their opinions and political views. Secondly, women are able to share educational information.

Furthermore, the study revealed that WhatsApp group forum has enabled the women to conduct business sales by marketing their products and services. The study also revealed that WhatsApp forums allowed members to discuss security situations within their communities.

Ponge (2016) [12] argues that the emergence of ICTs provides an unrivalled opportunity for women to exploit their capabilities to improve their quality of life as well as the contribute for the welfare of the society. The empowering use of ICTs is closely connected to socio-economic development, and this potential towards social transformation demands that everyone should have access.

Melhem, Morrell and Tandon (2009) [9] reviews how women in the developing world access and use ICT. The paper highlights that women from the grassroots are using ICTs to expand their mission and drive their passion to improve the world.

There is a growing reality that women's engagement in ICTs is important for multiple forms of development including, social and political justice as well as economic development. Women's full participation in the knowledge society is indeed a necessary condition for development to take place. The lack of participation by women will slow progress and negatively impact families and communities.

3.2 Barriers to women's access to and use of ICTs

Women and girls face a multitude of barriers to accessing and using ICTs, including economic disadvantages, unequal access to devices and training, and a lack of digital literacy skills. These barriers hinder women's capability to profit from the potentiality of ICTs.

The article by Singh, Singh and Kumar (2018) [16] explored the state of Indian women with regard to access, usage and effects of ICT tools. In terms of social challenges in access to and usage of ICT, the study observed the role of patriarchal backlash over the use of ICTs by women, along with a lack of time due to household chores, the lesser value given to women's access to ICTs by men, and traditional structures. Women also displayed unenthusiastic use of ICT among women in a male-dominated society, which can further exacerbate gender inequality. This study also identifies and qualifies various psychological barriers and other derivative problems that women face, alongside the political and institutional players limiting information access.

Broadly, fluctuating low income of women, unforeseen/unexpected family expenses (economic reasons); social assumption that ICT is useless and inappropriate for women (social reasons); doubts about their ability to learn ICT skills (lack of confidence and hesitation) and belief that ICT is more useful for males (psychological reasons); language problems with regard to content and difficulty in accessibility of ICT tools, lack of ICT skills (practical problem) and information on women's right not easily accessible (institutional barrier) has been identified as the prominent barriers in access and use of ICT for women in India (Singh, Singh & Kumar, 2018) [16].

The study by Madanda, Kabonesa, and Bantebya-Kyomuhendo (2007) [8] based on an empirical study conducted in the 2005/6 academic year at Makerere University in Uganda indicate that enrolment of women in ICT courses has risen from about 15% to 40% by the end of 2006, and there is increased use of internet, email, networking and research. However, there are

challenges of empowering women through access to ICTs. This study revealed that obstacles largely emanate from patriarchal, institutionalized work and programmatic ethics, limited physical ICT facilities, as well as individual characteristics, perceptions and attitudes. They concluded that skills and physical access alone are insufficient to bring about women's empowerment. Other factors, like participation in decision making and access that takes into account the different time demands of women and men, need to be considered if ICTs are to contribute to women's empowerment. There is also a need for multiple ways of disseminating ICT policies and information to effectively reach both males and females. Furthermore, the study has shown that the policy, the major instrument for the implementation of activities, is not gender-inclusive. Consequently, there are marked differences in terms of accessing physical ICT facilities depending on gender in terms of training, management and institutional support.

Ponge (2016) [12] argues that an acute lack of infrastructure in Kenya seriously limits opportunities for using ICTs for economic and social development. Further, women have less income, education, time, mobility, and face religious and cultural constraints that restrict their access to, and use of, technology. Additionally, rural women are more disadvantaged than younger, more literate or wealthier urban women. Infact women are poorly placed to benefit from the knowledge economy because they have less access to scientific and technical education, and less access to skills training and development.

The study which was undertaken by Verma *et al* (2018) [20] for assessing barriers in adoption and use of ICT among rural women in Uttar Pradesh indicates that despite major advancement in technology, accessibility and use of various ICT tools have been a major challenge for rural women in India. Findings of the study suggested that the technological barriers were found to be the most important factor in using ICT by rural women followed by cultural barrier followed by infrastructural barrier and personal barrier.

It should be noted that the potential of ICT as a tool to reduce gender inequality and strengthen the position of women in a society is increasingly recognized. Nevertheless, a significant gender digital divide is also observed, which is reflected in women's low level of access and use of ICT as compared to men due to socioeconomic, structural, psychological, and institutional barriers. Therefore, it is important to remove these barriers that discourage women from adopting and using ICT through various policy measures.

3.3 Enablers to women's access to and use of ICTs

An enabler supports and facilitates implementation, may include things like time, money, and a barrier impedes implementation and use (e.g., the users' lack of skills). Different studies have come up with enablers to information access and use by women. More and more people today are using technology, digital tools to work independently, market their brands or ideas, monitor results instead of hours and in particular to balance their personal/career lives, which the traditional model, namely the long-hours tied down to a desk model does not permit.

According to Kamberidou and Fabry (2012) [6] Technology as an enabler means flexible working conditions for both women and men. Digitally mobile lifestyles and virtual workplaces refer to new models of work, flexi-programs and schedules, which are usually perceived as a benefit for women with children and associated with low commitment. This is untrue! Firstly, the demand for greater flexibility is not only about motherhood. Not only women want more flexibility in relation to work today. For example, teleworking—working at home using a computer and phone— is most common among highly skilled senior ranking men. (Wittenberg-Cox, and Maitland, 2009) [21].

The study by Shange (2022) [14] which aimed at understanding the barriers that women encounter in their career journeys and the enablers that helped them overcome the barriers as they persisted and advanced in IT showed that factors such as computer access at a young age played an important role in creating a positive attitude towards IT or computer-related careers. Factors such as availability of bursaries for IT qualifications and knowledge of family members about the IT careers were most likely to increase the chances of young woman choosing an IT career. The results also showed that young women who liked Science, Technology, Engineering, and Mathematics (STEM) subjects were more likely to study IT or computer-related qualifications. The IT industry career stream, along with the support employees received from family and organizations, also played a significant role in determining the persistence of women in their IT careers. Furthermore, mentorship and sharing of opportunities within professional networks also contributed positively to the advancement of women in this industry.

3.4 Initiatives that aim to close the digital gap between men and women

IGI Global (2008) [5] defines Digital Gap, which is also known as digital divide, as a new form of social inequality derived from the unequal access to the new information communication technologies by gender, territory, social class and so forth. In other words, the digital divide is simply the gap between those who can access and use technology and those who cannot. Over the years, various initiatives and interventions have emerged to bridge this gap, particularly focusing on gender disparities.

One such initiative is the Women in the Digital Economy Fund, launched by U.S. Vice President Kamala Harris in March 2023. Supported by the U.S. Agency for International Development (USAID) and the Bill & Melinda Gates Foundation, this collaborative partnership aims to identify and directly fund evidence-based solutions to close the gender digital divide. The Fund seeks to improve women's livelihoods, economic stability, and resilience. It unites governments, private sector companies, foundations, civil society, and international organizations, focusing on five main areas: Access and Affordability, Relevant Products and Tools, Literacy and Skills, Safety and Security, and Data and Insights (USAID, 2023) [19].

Silvano (2023) [15] also argues that effective measures are needed to address several persisting challenges faced by women in the digital economy. He proposed the following set of solutions, which need to be undertaken at different levels of society and encouraged individuals and organizations alike to get acquainted with these targeted solutions, as well as to reflect and question their current practices:

- Discuss the limiting norms and beliefs that restrict women's Internet use,
- Invest in infrastructures and connectivity to increase women's access to digital devices,
- Include digital literacy training from an early age,
- Measure the gender digital divide in a systematic way,
- Reduce threats that women face online,
- Design more digital products for women.

At the international policy level, W20 Argentina (2018) [11] underscores the importance of gender-disaggregated data to inform digital inclusion efforts and proposed the following to close the digital gap:

- Gender-disaggregated data on digital inclusion, including internet access and use and participation in the digital sector.
- The integration of a gender perspective into relevant policies and strategies.
- A focus on addressing the barriers to women's access to and use of the internet and digital services, as well as their participation in the digital sector.
- Coordinated action by many different stakeholders working together to address the digital gender gap.

Educational interventions also play a crucial role in closing the digital divide. The paper by Lasen (2010) [7] highlighted key themes which emerged from schoolgirls' responses to focus group questions regarding perceptions of Information Communication Technology (ICT) subjects in the Queensland senior secondary curriculum, primarily, Information Processing Technology (IPT) and Information Technology Systems (ITS). Findings indicate that schoolgirls' participation in ICT pathways may be well promoted through subjects that position and call for students to engage with ICTs as 'enablers' in diverse, meaningful and creative human contexts.

Furthermore, Aguboshim, Obiokafor, and Nwokedi (2022) [3] underscore the changing role of ICT literacy in advancing gender equality. In their study they argue that leveraging women's literacy abilities for ICT adoption and usability may increase their sociability capital resources, thereby advancing sustainable goals for the significant reduction of gender inequalities. With ICT literacy, technology and the internet become enablers for girls and women for harnessing the power of technology for innovative solutions, capable of providing equal employment opportunities that can stimulate economic growth and development. There cannot be significant gender equality without effective leveraging of ICT innovations, literacy, adoption, and usage for the economic empowerment of women and girls.

Huyer and Sikoska (2003) [4] in their book titled Overcoming the Gender Digital Divide: Understanding ICTs and their Potential for the Empowerment of Women proposed the most important approaches and strategies for overcoming the barriers to women's access and use of ICTs. These include:

a. Ensuring a gender perspective in ICT-based projects;
b. Ensuring adequate and sustainable technology transfer;
c. Designing technologies appropriate to women's needs;
d. Ensuring gender-sensitive ICTs policy and regulation.

The reviewed literature shows that speaking about the digital gender gap is not merely about providing devices or internet access, it is a multidimensional task involving social norms, literacy, safety, and relevant policy frameworks.

4. Conclusion and Recommendations

This article has examined key barriers and enablers to women's access to and use of ICTs. Literature has shown that women face numerous challenges in accessing and using ICTs. The prominent ones are lack of time, lack of skills, and lack of expertise in ICTs, low income for women and also due to traditional structures. Furthermore, the study has shown that various enablers or facilitators cause women to use and access ITCs. These include computer access at a young age, availability of bursaries, knowledge of family members about the IT careers, liking (STEM) subjects such as mathematics and support from families and mentorship. Finally, the study has revealed that various organizations globally, such as W20, USAID and scholars have devised strategies to mitigate the digital divide. Bridging the digital gender divide requires a complex approach that fights the existing barriers as well as promoting the enablers. The collective strength of government, civil society, non-governmental organizations, private sector and education institutions are very critical to ensure that women and girls are not left behind in the digital age.

Based on the literature review findings, the study has made the following recommendations:

- Stakeholders should urgently address the barriers identified in the literature,
- Stakeholders should enact a policy framework that encourages/promotes equal access to and use of ICTs,
- Stakeholders should actualize strategies, initiatives and projects that support women's access to and use of ICTs in order to close the digital gap.

References

1. Abubakar NH, Dasuki SI. Empowerment in their hands: use of WhatsApp by women in Nigeria. Gender Technol Dev. 2018;22(2):164-83. Available from: https://www.tandfonline.com/doi/full/10.1080/09718524.2018.1509490 [Accessed 15 Nov 2023].
2. Abubakar N, Dasuki SI, Quaye A. The contribution of ICTs to women empowerment: A capability perspective, 2017. Available from: https://d1wqtxts1xzle7.cloudfront.net/104309269/301371859-libre.pdf [Accessed 17 Nov 2023].
3. Aguboshim FC, Obiokafor IN, Nwokedi CC. Closing ICT usability gaps for Nigerian women and girls: Strategies for reducing gender inequality. World J Adv Res Rev.

2022;15(1):56-63. Available from: https://wjarr.com/content/closing-ict-usability-gapsnigerian-women-and-girls-strategies-reducing-gender-inequality [Accessed 17 Nov 2023].
4. Huyer S, Sikoska T. Overcoming the gender digital divide: understanding ICTs and their potential for the empowerment of women. Santo Domingo: INSTRAW, 2003. [Accessed 19 Nov 2023].
5. IGI Global. What is digital gap? 2008. Available from: https://www.igi-global.com/dictionary/digital-divide-education-knowledge-society/7630 [Accessed 15 Nov 2023].
6. Kamberidou I, Fabry J. Redefining professional success and concepts of excellence: integrating a gender perspective. Presented at: INNOVACIONES CIENTIFICAS Y PERSPECTIVA DE GÉNERO (Scientific Innovations and the Gender Perspective), 2012. Available from: http://generoyciencia.org/?lang=en [Accessed 15 Nov 2023].
7. Lasen M. Education and career pathways in information communication technology: what are schoolgirls saying? Comput Educ. 2010;54(4):1117-26. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0360131509003088X [Accessed 16 Nov 2023].
8. Madanda A, Kabonesa C, Bantebya-Kyomuhendo G. Challenges to women's empowerment through ICTs: the case of Makerere University. Agenda. 2007;21(71):81-8.
9. Melhem S, Morrell C, Tandon N. Information and communication technologies for women's socioeconomic empowerment, 2009.
10. Olatokun WM. Availability, accessibility and use of ICTs by Nigerian women academics. Malays J Libr Inf Sci. 2007;12(2):13-33. Available from: https://borneojournal.um.edu.my/index.php/MJLIS/article/view/6994 [Accessed 7 Nov 2023].
11. W20 Argentina. Policy brief: recommendations for action—bridging the digital gender gap. 2018. Available from: https://www.gsma.com/latinamerica/wp-content/uploads/2018/07/Policy_Brief_W20_DigitalInclusion_2018.pdf [Accessed 14 Nov 2023].
12. Ponge A. Bridging the gender digital divide: challenges in access and utilization of ICTs for development at the devolved level in Kenya. Int J Innov Res Dev. 2016;5(7):328-39.
13. Robertson D, Ayazi M. How women are using technology to advance gender equality and peace. Washington, DC: United States Institute of Peace, 2019. Available from: https://www.usip.org/publications/2019/07/how-women-are-using-technology-advance-gender-equality-and-peace [Accessed 6 Nov 2023].
14. Shange PN. Barriers and enablers experienced by women in senior information technology positions in South Africa [dissertation]. Durban: University of KwaZulu-Natal, 2022. Available from: https://researchspace.ukzn.ac.za/handle/10413/21619 [Accessed 17 Nov 2023].
15. Silvano. The digital transformation requires closing the gender digital divide, 2023. Available from: https://digico.global/the-digital-transformation-requires-closing-the-gender-digital-divide/ [Accessed 10 Nov 2023].
16. Singh S, Singh S, Kumar A. Women and ICT: a study on access and perceptions in north India. Indian J Hum Dev. 2018;12(3):401-19. Available from: https://journals.sagepub.com/doi/pdf/10.1177/0973703018818588 [Accessed 10 Nov 2023].
17. United Nations APCICT. The linkage between ICT applications and meaningful development. Academy of ICT Essentials for Government Leaders. 2nd ed. Incheon: UN-APCIC, 2011. Available from: http://www.unapcict.org/academy [Accessed 17 Nov 2023].
18. UNICTTF Secretariat. Information and communication technologies and their impact on and use as an instrument for the advancement and empowerment of women. 2002. Available from: https://www.un.org/womenwatch/daw/egm/ict2002/reports/EGMFinalReport.pdf [Accessed 17 Nov 2023].
19. USAID. Fact sheet: the U.S. government, in collaboration with G20 countries and partners, launches global initiative on women in the digital economy, totaling over $515 million, 2023.
20. Verma RK, Singh S, Kumar A, Sharma R. Adoption of information and communication technology among rural women in Uttar Pradesh: a study of barriers. J Community Mobil Sustain Dev. 2018;13(3):578-82.
21. Wittenberg-Cox A, Maitland A. Why women mean business: understanding the emergence of our next economic revolution. Hoboken, NJ: John Wiley & Sons, 2009.