The Digital Exclusion: Understanding The Gender Digital Divide in A Connected World

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ABSTRACT

Despite rapid global digitalization and expanding internet penetration, significant gender disparities persist in access to, use of, and benefits derived from digital technologies. This paper examines the phenomenon of digital exclusion through the lens of the gender digital divide in an increasingly connected world. Drawing on secondary data, policy reports, and existing scholarly literature, the study explores the structural, socio-cultural, economic, and educational factors that contribute to unequal digital participation between men and women.

The analysis highlights that the gender digital divide extends beyond mere access to devices and connectivity, encompassing disparities in digital literacy, online safety, technological skills, and economic opportunities. Women, particularly in developing and rural contexts, face compounded barriers including affordability constraints, restrictive social norms, limited educational opportunities, and exposure to online harassment. These factors not only restrict digital engagement but also limit women's participation in digital economies, e-governance, online education, and financial inclusion.

The paper argues that digital exclusion reinforces broader gender inequalities and undermines inclusive development goals. Addressing the gender digital divide requires multi-dimensional policy interventions, including affordable infrastructure, gender-responsive digital literacy programs, safe online environments, and targeted initiatives to enhance women's representation in STEM and technology-driven sectors. Bridging this divide is essential for achieving equitable digital transformation and sustainable development in the 21st century.

Keywords: Gender digital divide, digital exclusion, digital inequality, women's empowerment, digital literacy, inclusive development.

1.Introduction

Digitalisation era contracts the world into the fist due to various technological innovation, simultaneously reinforce the divide of haves and haves-not in accessibility of technology. The rapid expansion of digital technologies has transformed economies, societies, and governance systems across the globe. Internet connectivity, mobile communication, artificial intelligence, and digital platforms now shape access to education, healthcare, financial services, employment opportunities, and civic participation. As the world becomes increasingly interconnected, digital inclusion is widely recognized as a critical driver of

economic growth, social mobility, and sustainable development. However, the benefits of digital transformation are not equitably distributed. Persistent disparities in access to and use of digital technologies have given rise to new forms of inequality, among which the gender digital divide remains one of the most significant.

The gender digital divide refers to the gap between men and women in access to digital devices, internet connectivity, digital literacy, and participation in technology-driven opportunities. Gender digital divide can be bridge up when inclusion of women increases in access to and use of digital technologies. Although global internet penetration has grown substantially over the past decade, women—particularly those in low- and middle-income countries—continue to face disproportionate barriers to digital inclusion. These disparities are not limited to access alone; they extend to digital skills acquisition, online safety, participation in digital labor markets, and representation in science, technology, engineering, and mathematics (STEM) fields. Consequently, digital exclusion reinforces existing socio-economic and gender inequalities.

The persistence of this divide is rooted in structural and systemic factors. Socio-cultural norms often restrict women's access to technology and limit their digital engagement. Economic inequalities reduce women's ability to afford devices and connectivity. Educational gaps hinder the development of digital skills, while concerns about online harassment and cyber violence further discourage participation. In many contexts, policy frameworks and digital strategies fail to adequately address gender-specific barriers, thereby perpetuating exclusion.

Understanding the gender digital divide requires a multidimensional perspective that goes beyond technological infrastructure to consider social, economic, cultural, and institutional determinants. Digital exclusion is not merely a technological issue but a development challenge with far-reaching implications. Limited digital access constrains women's participation in e-commerce, remote work, digital financial services, and online education, thereby restricting opportunities for economic empowerment and social advancement. Moreover, unequal digital participation undermines progress toward global development agendas, including gender equality, reduced inequalities, and inclusive innovation.

This paper examines digital exclusion through the lens of the gender digital divide in a connected world. It seeks to analyse the underlying causes, assess the socio-economic implications, and explore policy interventions necessary to promote gender-responsive digital inclusion. By situating the discussion within broader debates on digital inequality and development, the study aims to contribute to ongoing scholarship and policy discourse on achieving equitable digital transformation. Bridging the gender digital divide is not only a matter of technological access but a prerequisite for inclusive and sustainable development in the twenty-first century.

2. Literature Review

The gendered digital divide is enacted in one of two ways: through lack of technical skill and through a physical limitation on access. The most of the existing research on the gender digital divide has focussed on disparities of accessibility. At the core of the digital revolution is the challenge of access to digital network, i.e. who get empowered and who is informationally marginalised by the accessibility of tools. According to Curtis Kularski [1] (p.5) "the digital divide is composed of a skill gap and a gap of physical

access to Information Technology (IT) and the two gaps often contribute to each other in circular causation. Without access to technology, it is difficult to develop technical skill and it is redundant to have access to technology without first having the skill to utilise it". Van Dijk and Hacker [4] discuss the idea that access to digital resources is a multi-faceted phenomenon consisting of four factors that work to regulate access; psychological, material, skills and usage. What began as a simple concept of there being "haves" and "have-nots" in the digital world, has evolved into a finer-grain conceptual framework. Psychological access is where the user has little interest in gaining access, or has negative attitudes towards computers. Material access relates to not having the

physical infrastructure. Skills access is where a person does not have the digital literacy skills to be effective on-line and usage access is where a person does not have the time or opportunity to access digital information, regardless of their skill level. The 4A perspective—awareness, access, attitudes and applications—focuses on digital gaps at the local/community level in addition to the national/global level, while the access-use definitions highlight the socio-economic factors, such as income and gender, that influence a person's ability to access ICT [5]. The term "access" in regards to the digital divide was initially used to refer to whether or not a person could connect to the Internet. Access later became a synonym for "use", at which time opportunity and choice were, unfortunately, conflated, as studies have since shown that more people have access to the Internet than actually use it [2]. Hibert (2009) discuss the term 'digital divide' as the divide between those included and those excluded from the digital age, leaving lots of room for interpretation. It also refers to 'situations in which there is a marked gap in access to or use of ICT devices' (Campbell, 2001 as cited in Alampay,2006). Thus, Global Digital Divide denotes the pattern of uneven distribution of ICT benefits worldwide (Pande & Weide, 2012) Rydhagen (2004) argues that as long as the digital divide is defined as lack of access to information to consumers, the only remedy would be of supplying ICTs for the sake of giving information and the interactive relations would be overshadowed. The Fourth World Conference on Women (1995) highlighted equality between genders stressed technology as a way to empower women and their capabilities. It has focussed that "Ensure women's equal access to economic resources, including land, credit, science and technology, vocational training, information, communication and market, as a means to further the advancement and empowerment of women…by means of international cooperation" In India the 11th Five Year Plan (2007-2012) significantly discussed about the question of gender disparity raised and relevancy for the technology was felt to make women educated, self-reliant, economically empowered and independent. Hence, technology was regarded as way to empower women and to achieve gender equality, technology is crucial pathway.

Understanding Digital Gender Divide:

For comprehending the Digital Gender Divide, it is prominent to detail the relationship between gender and technology. This will aid to know the socio-cultural part of technology and how they create gender roles. Radical feminists focus that technology is a form of power to create gendered relations whereas liberals see it in terms of male control over neutral technologies. Social feminist stressed on the relationship between women's work and technology. Wajcman (2004) in her book wrote the issue of men's hold on technology and dominating women and restricted them into subordinate positions. She expressed that "Technology may have seen as socially shaped, but shaped by men to the exclusion of women."

Cynthia Cockburn (1983) discussed that "The masculinity of technology, men's proprietorial grasp of machinery, has been as a product of social rather than biological history" Sadie Plant (1998) highlighted women's contribution to technology and how they are an integral part of this process. Plant said that "women did not play a minor role in the creation of digital machines. When computers were virtually real machines women wrote the software on which they ran." She also dialogued about the insecurities of men when women entered into the engineering and technological sector in 1990's. Plant said that women and robots have apparently posed a challenge to their masculinity.

As this paper protract the definition of 'gender divide' & 'digital divide' to a new notion named 'digital gender divide'. It is necessary to understand the concept of digital divide which revolved around "accessibility" i.e. one's accessibility or inaccessibility to digital knowledge and technology.   The term 'digital gender divide' implies the gap between men's and women's access to ICT. Huyer and Sikoska (2003), has focussed that "The phenomenon of embracing the disparities in access and use of ICT by women and men."Oxford Internet Institute measured the gender digital divide into four categories:

- Technical Access
- Ability to use access
- Take up of access
- Impact of access

3. Objectives

The primary objective of this study is to examine the nature, determinants, and implications of the gender digital divide within the broader context of digital exclusion in a connected world. The study seeks to provide a multidimensional understanding of how structural, socio-economic, and cultural factors shape gendered disparities in digital access and participation.

The specific objectives are:

- To assess the extent of gender disparities in access to digital technologies, including internet connectivity, mobile devices, and digital infrastructure.

- To examine the socio-economic and cultural determinants that contribute to the gender digital divide, such as income levels, education, geographic location (urban–rural), and prevailing social norms.

- To evaluate gender differences in digital skills and patterns of technology use, including participation in online education, digital financial services, and digital labour markets.

- To analyse the impact of digital exclusion on women's economic empowerment and social inclusion.

- To identify policy measures and strategic interventions that can effectively reduce the gender digital divide and promote inclusive digital development.

Scope of the Study:

Population scope: The study focuses on women and girls who encounter varying levels of digital access and participation in the digital economy.

Thematic scope:

- Ownership, affordability and connectivity of digital device
- Infrastructure gaps between urban and rural areas.
- STEM education participation among women and girls
- Digital entrepreneurship
- Gender based cyber threats
- Digital inclusion strategies

Methodology

The study adopts a descriptive research design to examine the digital exclusion of women in a connected world as a gender digital divide. This study explores the extent of digital access, usage and skills divide among gender and study socio-cultural barriers, economic disparities and perception digital exclusion. The study of universe include-

- Women who are in working age adults and entrepreneurs.
- Girls who are youth and students.
  A purposive sampling technique is used to select respondents who are women in working age adult and entrepreneurs and girls who are young as well as students. The primary data is be collected by structured and semi-structured interviews, questionnaires and focus group discussions. The secondary data is collected by books, journals, research articles, Government reports, newspaper etc.

A-Challenges and barriers in the path way of Digital Inclusion

Economic Barriers

- **Affordability of devices and data:** Women, particularly in low-income households, are less likely to own smartphones or computers.
- **Income inequality:** Gender wage gaps limit women's ability to afford digital services.
- **Control over financial resources:** In some contexts, women lack autonomy in household spending decisions.

Educational and Skills Barriers

- Lower digital literacy rates
- Limited STEM participation
- Confidence and self-efficacy gaps

Socio-Cultural Norms and Gender Roles

- Restrictions on women's mobility
- Time poverty due to unpaid care work
- Cultural perceptions of technology as "male" domains

Safety, Privacy, and Online Violence

- Cyber harassment and gender-based online violence
- Digital surveillance and privacy concerns
- Fear of reputational damage

Infrastructure and Geographic Disparities

- Rural connectivity gaps
- Electricity access limitations
- Limited broadband infrastructure

Policy and Institutional Barriers

- Gender-blind digital policies
- Lack of sex-disaggregated data
- Underrepresentation of women in tech governance

B-Exploring Structural Barriers to Women's Digital Participation

Women's digital exclusion is not merely a question of individual access or skill deficits; it is deeply rooted in structural inequalities embedded within economic systems, education, governance, infrastructure, and socio-cultural institutions. Structural barriers operate at macro (policy and economic), meso (institutional and community), and micro (household) levels, reinforcing persistent gender disparities in digital participation.

o **Economic Inequality and Resource Distribution-**Structural economic inequality significantly constrains women's digital participation. Globally, women earn less than men, are overrepresented in informal employment, and have lower asset ownership. These disparities directly affect device ownership, affordability of mobile data and broadband, access to digital financial services

o **Educational and Skills Gaps-** Education systems play a critical structural role in shaping digital participation. Gender disparities in STEM education, digital literacy training, and technology exposure limit women's entry into high-growth digital sectors. These disparities are because of gendered curriculum design, lack of female role model in technology areas, stereotyping and biasness of teachers

o **Labor Market Segmentation-**Digital participation is also shaped by structural labour market inequalities such as occupational segregation into lower-paid sectors, underrepresentation in ICT and technology leadership roles and limited access to formal employment benefits (e.g., remote work infrastructure)

- o **Policy and Governance Gaps-**Gender-blind digital policies reinforce structural inequality which include lack of sex-disaggregated digital access data, absence of gender-responsive ICT strategies and limited representation of women in digital governance.
- o **Infrastructure and Geographic Disparities-**Infrastructure deficits disproportionately affect women in rural and marginalized regions such as poor broadband coverage, unreliable electricity and limited public access centres.
- o **Socio-Cultural Norms Embedded in Institutions-** The gender norms are structurally embedded within legal systems, property ownership laws and family decision-making hierarchies
- o **Digital Safety and Regulatory Frameworks-** Structural failure to protect women in digital environments reduces meaningful participation, even where access exists. Online harassment, surveillance, and gender-based digital violence deter women from full participation. Weak regulatory frameworks, inadequate reporting mechanisms, and limited platform accountability compound the problem.

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