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Bridging the Gap: Unveiling the Gendered Digital Divide in Haryana State, India

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Author's contribution

The sole author designed, analysed, inteprted and prepared the manuscript.

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ABSTRACT

This study investigates the gender-specific digital divide regarding ICT access, affordability, and ICT skills, focusing on four districts of Haryana: Gurugram, Panchkula, Mahendragarh, and Nuh, selected based on the level of the SDG index ranking for quality education in Haryana. The SDG ranking provides a relevant context for understanding the problem. The researcher collected data from 120 respondents (60 men and 60 women) across four districts. The data was collected with questionnaires and interviews. The questionnaire was related to ownership of ICT devices, employment status, and basic and advanced skills needed for using that device. The findings revealed that women lacked access and affordability; forty percent of women did not own a phone, and 90 percent of women were unemployed, proving the fact. More than 80 percent of women do not have advanced skills, which is a significant ICT skill gap. Additionally, a Statistical analysis using the chi-square test showed a p-value less than 0.05 for all three hypotheses (gender and ICT access, affordability, and skills), indicating a strong impact of gender on the digital divide.

Keywords: ICT; gender; digital literacy; skills.

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1. INTRODUCTION

In the last decade, information and communication technology has spread rapidly worldwide (Acilar,2011). The term (ICT) encompasses tools for handling broadcast media, telecommunications, audio-visual Technology, networking, controlling, and monitoring functions. It plays a vital role in society by facilitating information storage, creation, processing, and exchange. The integration of ICT transformed every sector of economies in tremendous ways, fostering innovation, connectivity, and efficiency on a global level. ICT manipulates the way we communicate, work, and share ideas. All these things present an optimistic view unless we find the term “gendered digital divide”. However, the concept of the "digital divide" was insufficient for understanding the reasons behind the unequal use of the Internet facility (Meneses & Mominó, 2010). The paper emphasizes how the fruits of ICT are not equally distributed to everyone, especially concerning gender (Acilar & Sæbø, 2023). Sinha and Sahay (2019) state, “Women with laptops are more powerful than men with guns.” However, the world is not ready to understand that women are equally capable of contributing to the digital economy. Therefore, women still lack equal access to digital facilities. gender equality is crucial for enhanced economic productivity, reduction of poverty, and overall prosperity. Therefore, ensuring access to broadband internet for women is one of the key steps toward gender equality, according to the (World Bank report, 2024). The uneven distribution of Internet services illustrated the digital divide problem, especially in low–income countries (ITU, 2023). Below 32 percent of women in India own a mobile phone, while the percentage is over sixty for men, as shown by the India Inequality Report (Oxfam report, 2022). The differences in internet access and digital literacy lead to unequal opportunities for employment, education, and social participation. Various factors are responsible for the issue of the gendered digital divide, including the area in which they live, social judgment, age, education, etc. However, the main factor we are looking at in this study is gender association with ICT. In the broader context, we can find disparities in equal access to digital resources and digital literacy based on gender. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), men have four times more advanced ICT skills than women in programming computers. According to a 2019 survey conducted by the Indian Statistical Institute, 74 percent of married women were not looking for jobs even though their families wanted them to work. here, gender-based information access was one of the reasons behind the low participation of women in the labor market. Unequal access to information means unequal access to work opportunities, which shows the world is not utilizing human power lower than the potential level. According to the Women Gender Snapshot Report 2022, women's exclusion from the ICT world in the last decade caused a loss of up to $1 trillion of total GDP for low and middle-income countries. Therefore, minimizing these gaps in ICT is crucial, especially for women living in developing countries like India. If an economy wants to achieve better growth with inclusive growth, then women should be a part of ICT with equal access. It will help women become more empowered on the social and financial front and with a meaningful life.

2. OVERVIEW OF THE PROBLEM

ICT has profoundly impacted our lives, shaping decisions in daily activities, politics, and social interactions through digital platforms. One can quickly access sports, flights, weather, and personal events updates. However, despite the widespread availability of ICT, significant gender disparities in access and use of digital devices persist. Despite the high female graduate ratio in STEM, the women's workforce is less than a third of India's STEM workforce (World Bank). Only one out of three women in India can use the internet, as per the report of the National Family Health Survey (2019-21). The economy prefers inclusive development, which means development for all, irrespective of caste, religion, gender, and economic situation. Still, distributional discrimination in the digital world based on gender is a prominent issue in the current era, reducing opportunities in terms of employment and overall growth for women. The gap between men and women regarding ICT access and use is called the gendered digital divide (ITU). Here, the researcher analyzes the gendered digital divide in three aspects: ICT access, affordability, and proficiency (basic and advanced skills). This can be indicated as:

- ICT access: Availability of mobile phone
- ICT affordability: Employment status
- ICT skills: Basic and advanced

3. LITERATURE REVIEW

The gendered digital divide showed several disadvantages for women. Rural penetration for internet services is below thirty percent, and women in rural areas are less likely to own a mobile phone than men. The internet cost for one GB of data accounts for three percent of the total monthly income in low–income households. Bias at the household level and the cost of the internet have also stopped women's equitable access to digital tools in low-income families. Social judgment and prevailing social norms are creating hurdles for women to become a part of the digital economy (ITU, 2021). Various studies indicated that women in India face barriers in access to digital technologies. According to the Internet and Mobile Association of India (IAMAI, 2021), internet penetration among women remained much lower than that of men, and rural women experienced the disparities significantly. Low literacy rates, low digital skills, and limited financial aid contributed to this gap (World Bank, 2021). Das et al. (2020) indicated how societal pressure and family dynamics often restricted women's access to digital technology and the Internet. in the Asia-Pacific region, India had the highest level of gender digital divide as per the Mobile Gender Gap 2021 report. Affordability is also a hindrance impacting women's access to technology. Empirical studies found that economic factors significantly influenced women's ability to buy smartphones or internet services (Jha et al., 2021).

Most families prioritize digital technology access for males, viewing it as an important investment for employment or education, while women's priorities are often neglected (Raghunandan, 2021). GSMA (2021) concluded that the high cost of mobile data remains an obstacle for most women, specifically in rural areas. The distressing fact is that only 15 percent of women in India use internet services. In addition, 25 percent of adult women owned smartphones compared to 41 percent of adult men, showing a wide disparity based on gender. The case of inequality, particularly in the gendered digital divide, referred to an obstacle to India's social development and inclusive growth. UNICEF (2023) highlighted the disparities between men and women in low-income countries regarding internet use. Most adolescent girls and women were offline compared to adolescent boys and men. In the case of digital skills, only 62 females had this in contrast to every 100 male youth. Across 41 nations, below 15 percent of female youth owned a mobile phone, restricting their ability to participate in the ICT world. Despite having access to technology, women's internet usage data often differ from men's. George (2021) revealed that women use mobile phones mainly for communication rather than fetching information data or utilizing online services such as e-commerce or social media apps. This limited use resulted from social norms and a lack of confidence in using digital technology for broader utilization (Choudhary & Gupta, 2020). Bala and Singhal (2018) concluded that despite owning digital devices, women could not use the Internet due to household chores and prevailing social norms in urban areas. Over 50 percent of females lacked basic skills in using mobile phones, and the leading cause was the prevailing patriarchy in our society. Women needed permission from their male family members to own digital devices. Potnis, D. (2016) revealed the unique idea of non-economic inequalities and the impact of these on owning a mobile phone by women. The study was conducted in slum areas of Maharashtra. The data showed that the leading cause that restricted the limits of women in the digital world was the oppression of gender roles in society. Most of the women were married at a very young age due to the common belief that it is unsafe to live independently for a woman in India. Young girls were married before they got financial independence. So, the societal norms created economic inequalities and significant obstacles to ICT access.

4. RESEARCH METHODOLOGY

The study utilizes primary data collected through a well-structured questionnaire. Initially, Haryana was purposively selected for the research. digital technologies have changed the nature and scope of the education system, bolstering the education sector worldwide with ICT integration strategies and policies (Timotheou et al., 2023). Therefore, to examine the digital divide by gender, four districts were chosen from 22, based on the index of quality education outlined in the Haryana SDG District Index Report 2022 published by the Finance Department of Haryana. Two districts with the highest index scores (Gurugram and Panchkula) and two with the lowest (Mahendragarh and Nuh) were selected to meet the study's objectives. The stratified random sampling method was used to select respondents from districts. A stratum represents a subgroup in a sample based on specific attributes (gender), and the respondents

are selected randomly from these subgroups. This method is used for the proportional representation of each gender and allows us deeper insights. 120 respondents were randomly selected from these four districts, with 30 respondents (50 % men and 50 % women) from each district. Therefore, the Chi-square test for independence was used to analyze the responses. The test determines whether a significant association exists between two categorical variables by comparing observed and expected frequencies. A significant outcome reflects a deviation from the assumption of independence between used variables in the study (Field, 2013).

The study aimed to explore the issue of the gendered digital divide through three key dimensions: access, affordability, and proficiency/skills of ICT. Basic and Android mobile phones were identified as essential ICT tools for navigating today's technological landscape. Thus, phones were selected to represent the ICT components of the research. The following variables are taken into account for ICT aspects:

1. Access to ICT: Owing a mobile phone
2. Affordability of ICT: Employment status
3. ICT skills: The person should know basic and advanced mobile phone skills.

Basic skills: One who can receive/ dial calls and read/send messages

Advanced skills: One who can send e-mails and use social media apps (WhatsApp, Instagram, etc.)

Objective of the Study:

1. To analyze the role of gender on ICT access (mobile phones).
2. To understand the role of gender in ICT affordability and ICT skills

Based on this information, three hypotheses were taken:

H1- ICT access is not associated with gender

H2- ICT affordability is independent of gender

H3- ICT skills are not associated with gender

Data Analysis: The section provides the demographics of respondents. that respondents are very diverse in employment status, age, and education.

Table 1 shows the demographic characteristics of 120 participants across various attributes such as education, gender, employment status, and age. The sample was evenly divided between both genders (men and women), each showing 50 % of respondents. Regarding education, 17.5% have secondary education, 20 % have higher education, and 30.8 % have primary education. 31.7% of participants were uneducated. The distribution is age-wise: 30% were aged 40-59, 30% were aged 18-39, and 40 % were over 60. Regarding employment, the majority, 67.5 %, are unemployed.

Table 2 depicts access to Information and communication technology, focusing on whether they own a mobile phone. Out of 60 participants, only four participants did not own a phone. The expected count of participants who reported owning a mobile phone is 46 for men and women. The second set of counts for women shows that 36 participants own a mobile phone, with an expected count of 14 for "no".

Table 3 shows the outcomes of Chi-square to analyze the relationship between owning a phone and two groups (men and women) of participants. The statistic 18.6 (Chi-square) signifies the difference between observed and expected frequencies (with the assumption of no association). With the one of (degree of freedom), the p-value near 0 (0.00002) indicates the difference between the groups is statistically significant, which means the null hypothesis (no association between ICT access and gender) can be rejected.

Table 1. Participants demographic breakdown

Gender	Frequency	Per cent
Men	60	50
Women	60	50
Total	120	100
Education		
Primary education	37	30.8
Secondary education	21	17.5
Higher education	24	20
Uneducated	38	31.7
Total	120	100

Gender	Frequency	Per cent
Age		
(18-39)	36	30
(40-59)	36	30
Above 60	48	40
Total	120	100
Employment		
Employed	39	32.5
Unemployed	81	67.5
Total	120	100

Source: Author compilation

**Primary education (1st to 8th), *Secondary education (9th to 12th), * Higher education (College or University)*

Table 2. Tabulation statistic gender ICT access

ICT access (owing mobile phone)				
Gender		Yes	No	Total
Men	Count	56	4	60
	Expected Count	46	14	60
Women	Count	36	24	60
	Expected Count	46	14	60
Total	Count	92	28	120
	Expected Count	92	28	120

Source: Author compilation

Table 3. Chi-Square test results

	value	df.	asymp.sig.(2sided)
Pearson χ^2	18.6	1	2E-05
N	120		

Source: Author compilation

Table 4. Tabulation statistic gender and affordability of ICT

Affordability of ICT (employment)				
Gender		Yes	No	Total
Men	Count	33	27	60
	Expected Count	19.5	40.5	60
Women	Count	6	54	60
	Expected Count	19.5	40.5	60
Total	Count	39	81	120
	Expected Count	39	81	120

Source: Author compilation

Table 5. Chi-Square test results

	value	df.	asymp.sig.(2sided)
Pearson χ^2	27.7	1	1E-07
N	120		

Source: Author compilation

Table 4 shows that 33 men have affordability (YES) in total 60, and the expected count is 19.5 in this category. In terms of women, only 6 women have affordability, with an expected count of 19.5. The observed frequencies show that fewer women have the affordability of ICT compared to men, and the expected count assumes that ICT affordability and gender are independent.

Table 5 summarizes the outcomes of the chi-square test, in which the chi-square statistic 27.7 indicates whether the observed count and expected values deviate significantly. With df. 1, the p-value equal to 0 indicates that the difference between expected and observed values is statistically significant. The null hypothesis is rejected, suggesting an association between gender and affordability.

Table 6. Tabulation statistic gender and ICT skills (basic)

Availability of ICT skills (basic)				
Gender		Yes	No	Total
Men	Count	53	7	60
	Expected Count	41	19	60
Women	Count	29	31	60
	Expected Count	41	19	60
Total	Count	82	38	120
	Expected Count	82	38	120

Source: Author compilation

Table 7. Chi-Square test results

	value	**df.**	**asymp.sig.(2sided)**
Pearson χ^2	22.2	1	2E-07
N	120		

Source: Author compilation

Table 8. Tabulation statistic gender and ICT skills (advanced)

	Availability of advanced skills			
Gender		Yes	No	Total
Men	Count	19	41	60
	Expected Count	13	47	60
Women	Count	7	53	60
	Expected Count	13	47	60
Total	Count	26	94	120
	Expected Count	26	94	120

Source: Author compilation

Table. 9. Chi-Square test results

	value	**df.**	**asymp.sig.(2sided)**
Pearson χ^2	7.1	1	1E-02
N	120		

Source: Author compilation

The table shows that 7 men do not have basic ICT skills compared to 31 women out of 60 participants in both groups. Assuming that gender and availability of basic ICT skills are independent, the expected count for men and women to have basic ICT skills is 41 and 19 for not having. The observed and expected counts are 82 (YES) and 38 (NO).

In Table 7, the Chi-Square Statistic ($\chi^2 = 22.2$) presents a significant deviation between actual and expected values, suggesting that gender and ICT skills (basic) availability are not independent. With 1 degree of freedom (df.), a very small p-value indicates that the null hypothesis (no association between gender and availability of basic ICT skills) is rejected. It suggests that gender is significantly associated with ICT skills.

Table 8 shows that 19 men possess advanced ICT skills compared to 7 women out of 60 men and 60 women. In total, 26 participants possess advanced skills, and 94 do not, of which 53 are women. The expected count for men and women was 13 (YES) and 47 (NO). If gender did not impact skills, the expected distribution would be 26 with skills and 94 without advanced skills.

Table 9 shows that the relationship between gender and ICT skills at an advanced level is significant, with a chi-square (χ^2) statistic of 7.10 and a p-value close to 0. Table 9 shows that the p-value is less than the significance level of 0.05, and H3 is rejected. This indicates that an alternate hypothesis is accepted: ICT skills and gender are not independent.

5. CONCLUSION

The study analysis shows significant differences in ICT access, affordability, and skills gap based on gender. Table 2 indicates that 40 percent of women do not own a mobile phone, while the

percentage was 6.6 for men. In addition, eighteen older women and seven middle-aged women did not have a mobile phone compared to one man and three men in the respective age groups. It suggests that ICT access was not the same for everyone. Table 2 also shows that only 10 percent of women were employed, meaning 90 percent could not afford a mobile phone alone. Table 3 shows that most participants own phones, and Chi-square results show a statistically significant association between ICT access and gender. A very low p-value, much lower than a significance level of 0.05, suggests that mobile phone ownership (ICT access) is significantly related to the groups (men and women) being compared, and H1 is rejected. Table 4 shows that the observed and expected counts with affordable ICT differ greatly, particularly for women. The table with the chi-square test results confirms that the affordability of ICT and gender have a significant association with a p-value close to 0, and H2 is rejected. The observed distribution for Basic ICT skills in men and women differs greatly from the expected counts. The chi-square 22.2 with a small p-value ensures that in terms of the availability of basic ICT skills, there is a significant gender difference. The results also indicate gender disparity in the availability of ICT skills (advanced), where men are more likely to possess advanced skills than women. The chi-square results also prove the significant association between gender and advanced skills in ICT by rejecting the null hypothesis. The results indicate that H3 is also rejected. Men show higher observed counts (19) than expected (13), compared to women having 7 observed counts. In summary, the results suggest gender disparity in access to ICT, affordability of ICT, and availability of ICT skills (Basic and advanced). The study found that seven out of thirty women could not use a basic phone, suggesting a gap in ICT skills. Young adults were the only age group doing well in basic and advanced skills (18-39). All the educated people had basic skills; unfortunately, 48 percent of women were educated, which was significantly lower than men, where the percentage was 88.5. The study also found that the problem of the gendered digital divide was high in the case of old age groups.

Discussion and suggestion: Based on the findings, it can be concluded that education is the key to equally distributing the fruits of ICT because all educated people possess ICT skills. Apart from education, affordability is a significant issue because most women are unemployed. Therefore, encouraging women to participate in the productive economy is a better solution. It was interesting to know that Education was not a big issue when it came to learning basic skills such as receiving and doing the calls. Some illiterate women who owned the device were doing these things efficiently. However, since the study included only those who could read and send the messages efficiently, these women were not counted as the women who had the basic skills. The women of the middle and young age group were educated, but only 10 percent were employed. the surprising fact is that most women were also good at basic skills and advanced. It means that despite having a good knowledge of ICT skills, some other factors are responsible for the unproductive women workforce. Despite having significant possibilities for educational progress for women in India, they are confined to an unproductive labor force; as discussed in the findings, there are various factors responsible for this, including societal pressure, lack of job opportunities, and low participation of women in the sector required high- productivity (Desai & Jain, 2017; Kabeer, 2018). Moreover, literacy is required in job markets. Still, studies highlighted the difference between basic and digital literacy (Pangrazio et al., 2020; Da Yan Shaidatul Akma Adi Kasuma Mansour Amini, 2023). Engaging and validating actively in the digital world is crucial, yet the situation remains backward in many sectors (van Dijk, 2020; UNESCO, 2018). Combining digital skills in the education system, especially for women, is key to removing the digital gaps and preparing women to thrive in the tech world (Sharma & Joshi, 2020; Bhattacharya & Singh, 2019).

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

The manuscript was edited by Laxmi Yadav, who hereby declares that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

COMPETING INTERESTS

The author has declared that no competing interests exist.

REFERENCES

Acilar, A. (2011). Issues in Informing Science and Information Technology Exploring the

Aspects of Digital Divide in a Developing Country. *Informing Science and Information Technology*, 8, 231–244.

Acilar, A., & Sæbø, Ø. (2023). Towards understanding the gender digital divide: A systematic literature review. *Global Knowledge, Memory and Communication*, 72(3), 233–249.

Bala, S., & Singhal, P. (2018). Gender digital divide in India: a case of inter-regional analysis of Uttar Pradesh. *Journal of Information, Communication and Ethics in Society*, *16*(2), 173-192.

Bhattacharya, S., & Singh, S. (2019). *Bridging the Gender Gap: The Importance of ICT Skills for Women's Empowerment in India*. International Journal of Educational Development, 69, 20-28.

Bridging the Gender Digital Divide: Challenges and an Urgent Call for Action for Equitable Digital Skills Development. (2023, May). https://data.unicef.org/resources/ictgender divide/.

Choudhary, R., & Gupta, L. (2020). *Understanding Women's Mobile Usage in Rural India: A Socio-Cultural Analysis*. Gender and Technology.

Das, A., et al. (2020). *Digital Divide and Gender in India: Current Trends and Challenges*. International Journal of Social Sciences.

Desai, S., & Jain, A. (2017). *Gender and Labor Force Participation in India: Trends and Determinants*. Economic & Political Weekly, 52(21), 36-45.

Facts and figures 2021.(n.d.).https://www.itu.int/itu-d/reports/statistics/facts-figures-2021/

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Sage Publications.

GSMA. (2021). *The Mobile Gender Gap Report 2021*. GSMA.

IAMAI. (2021). *Internet Users in India 2021*. Internet and Mobile Association of India.

India Inequality Report 2022: Digital Divide. (2022, December 5). https://www.oxfamindia.org/knowledgehub/ workingpaper/india-inequality-report-2022-digital-divide

Jha, S., Kashyap, S. K., Ansari, M. A., Goswamy, P., & Singh, S. (2021). Information Communication Technology: a communication tool for women empowerment. *www.ijcmas.com*. https://doi.org/10.20546/ijcmas.2020.1001.070

Kabeer, N. (2018). *Women, Work, and Empowerment: The Role of Gender in the Labor Market*. Oxford University Press.

Meneses, J., & Mominó, J. M. (2010). Putting Digital Literacy in practice: How schools contribute to digital inclusion in the Network Society. *The Information Society*, *26*(3), 197–208. https://doi.org/10.1080/01972241003712231

Pangrazio, L., Godhe, A., & Ledesma, A.G. (2020). What is digital literacy? A comparative review of publications across three language contexts. *E-Learning and Digital Media, pp. 17*, 442–459.

Potnis, D. (2016*).* Inequalities creating economic barriers to owning mobile phones in India: Factors responsible for the gender digital divide. *Information Development*, *32*(5), 1332-1342.

Press release. (2023, November 27). ITU. https://www.itu.int/en/mediacentre/Pages/PR-2023-11-27-facts-and-figures-measuring-digital-development.aspx

Raghunandan, T. (2021). The Economics of Connectivity: Women and the Digital Divide in India. *Journal of Economic Perspectives.*

Sharma, S., & Joshi, M. (2020). *The Role of ICT in Empowering Women:* A Study on the Impact of Technology on Women's Education and Employment in India. *Journal of Education and Technology,* 32(2), 124-136.

Sinha Bhawna, & Sahay, S. (2019). ICT-A Tool for Women Empowerment. *Women Empowerment Re-Visioning Identities and Building Strategies for a Participatory Society*.

Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and information technologies*, 28(6), 6695-6726.

UNESCO. (2018). *Digital Literacy in Education: A Literature Review*. United Nations Educational, Scientific and Cultural Organization (UNESCO).

van Dijk, J. A. (2020). *The Digital Divide: The Internet and Social Inequality in International Perspective* (2nd ed.). SAGE Publications.

World Bank. (2021). *Women, Business and the Law 2021*.

World Bank. (2024, December 17). 2024 key development challenges in nine charts.

Yan, D., Adi Kasuma, S.A., & Amini, M. (2023). Gender Difference in Digital Literacy Among Translation Trainees: Self-perceptions and Application Abilities. *International Journal of Academic Research in Progressive Education and Development*.

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