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Impact Of The Digital Divide On Educational Attainment For Women's Empowerment In India

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Abstract
Background*:*
The adoption of digital technologies in all aspects of our lives has opened up new opportunities and challenges globally. Digital technologies are creating new opportunities to deliver work or services more efficiently and productively. The increase in innovations in this field, which has become more apparent after the COVID-19 pandemic, is so rapid that an abundance of new services and employment opportunities are emerging. However, even as technology rapidly expands and opportunities increase, it remains a fact that these opportunities are not equally accessible to women and girls worldwide. I'd Blush (2019) *highlights the persistence and severity of the gender gap in digital skills. Since information and communication technologies (ICT) play a key role in providing opportunities to access information on various aspects such as education, healthcare and banking, they also play a key role in empowering women. When there is a gender divide in digital technology access, it further hinders progress towards achieving empowerment for individuals and the societies or regions they belong to. This divide results in limited opportunities for education reduced participation in economic activities, and, consequently, decreased involvement in social activities. India, the fifth largest economy in the world as it stands in 2023, where the digital divide and exclusion are still observed, was selected for this study as it makes a good representation of the world in general with the continuous progress it is making in digital technologies. While studying the role of the digital divide in educational attainment and its impact on women's empowerment, this paper examines the role of education in developing digital skills, the changes in digital education opportunities post-COVID-19 pandemic, the barriers women face in accessing education opportunities, the criticisms of digital education and the social impact of the gender digital divide. This paper argues that education and digital education are closely intertwined. Merely having access to digital technology is insufficient to remove the gender divide in digital education. Instead, a supportive environment is necessary to use these technologies effectively. Effective promotion of digital adoption by the government, private sector and civil society* (Mariscal et al., 2019) *is one way to spread awareness about the scope and opportunities that the digital education system provides. This can empower individuals in society, irrespective of gender differences. Conscious efforts must be taken by each and every individual to reduce the impact of barriers that hinder progress. Without such efforts, the country as a whole will miss the opportunity to create an empowering environment for women and girls. While digital technology is advancing rapidly, it is crucial to address the obstacles that prevent their full participation.*
Research question & methods*:*
In all discussions about the disparity in digital education among women, the lack of education itself is often cited as one of the main causes. The correlation between women's empowerment and educational attainment is also a recognised fact worldwide. As technology progresses, various opportunities for educational attainment have emerged, one of which is digital educational systems. While we are witnessing rapid growth in digital educational opportunities across the globe, it is concerning that the digital divide between men and women inhibits women and girls from accessing these opportunities, even within the facilities of their own homes. This paper examines the gender divide in digital technology access and its impact on educational attainment. A descriptive research design is used to collect data from a randomly selected group of women from different professional, cultural and religious backgrounds. Responses were collected using six parameters, as listed in Tables 4 and 6, to survey the social benefits of digital education. Additionally, another six parameters, as listed in Tables 5 and 7, were used to survey the barriers that hinder women's access to digital technologies.
Results*:*
This study analysed three main elements among women with different professional, social and religious backgrounds. Firstly, it examined the usage of the internet based on educational background and age group. Secondly, it explored the social benefits achieved through digital education. Lastly, it investigated the barriers to accessing digital education opportunities.
While analysing the 'use of the internet' for individuals with different educational backgrounds, as shown in Table 2, we can observe that the internet is mainly used for accessing social media platforms such as Facebook, WhatsApp and YouTube. The educational use of the internet is lower compared to its use for social media

platforms. Almost similarly, the case is observed with 'internet usage' among different age groups, as indicated in Table 3. Higher internet usage is attributed to social media access. At the same time, we can see that internet usage for educational purposes is much higher among individuals below the age of 20 and those between the ages of 20 and 30. This is a sign of improvement in using digital technology for education during the early and middle stages of one's education. Having said that, this paper does not argue that using digital technology less as one gets older is beneficial. Instead, it points out an opportunity for further study into why the use of digital technology for educational purposes decreases with age. With appropriate awareness and training, age should not be a barrier to education, including access to digital educational systems. The comparison of internet access in Table 2 and Table 3 shows that there is a greater emphasis on social media access. This is beneficial for fostering connections in a digitally connected society. At the same time, making wiser use of the internet for accessing social media and engaging in personal development activities, such as educational purposes, can help individuals take advantage of technology for personal empowerment. This can directly contribute to the well-being of oneself, one's family and wider society.

Secondly, regarding the social benefits of digital education for women, out of the six parameters analysed, it is seen that the mean values for 'use of smartphones', 'role in family decision making' and 'medical treatment access' are greater than three. This shows that people have greater access to smartphones, which are useful in various situations such as keeping contacts, browsing the internet and accessing digital educational platforms. At the same time, the mean value for 'use of bank account', 'house or land ownership' and 'freedom to travel' is below three but above 2.5. This shows that there have been some improvements, but there is still more work required to ensure that women are not forbidden from having their own bank accounts, owning a house or land in their name and travelling without fear for their safety.

Thirdly, when examining the barriers to women's access to digital education, 'computer phobia' is identified as the reason with the lowest rating out of the six parameters analysed. This shows that, although there is an element of 'phobia' to adopt new technologies that women are not familiar with, there are other reasons that prevent them from accessing these opportunities. In that, 'attitude that women are homemakers' is rated as the highest barrier, followed by 'social/cultural/religious factors', 'lack of broadband connectivity', 'lack of education' and 'lack of income'. Here, we can see that there are externally imposed factors that still act as barriers to women accessing digital education.

Conclusion:

In this study, it was found that individuals who have internet access predominantly use it to access social media platforms rather than educational platforms. While it is acceptable to rely on digital connectivity in today's world, it is equally important to leverage the wider scope of the internet to access rapidly improving digital platforms for educational purposes. This paper argues that increasing awareness of digital education opportunities can help improve this. While the constitution guarantees equal rights for every individual to receive education and live a life with dignity, irrespective of gender, this study identifies existing barriers that forbid women from accessing digital education opportunities. It is imperative to address these barriers; otherwise, the closure of the gender digital divide will be slower, and women will fail to realise their inborn talents and aspirations through no fault of their own.

Keywords: *Gender Digital Divide, Digital Divide, Digital Education, Women Education*

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I. Introduction

It is of great importance that United Nations Educational, Scientific and Cultural Organisation (UNESCO) has dedicated 24 January 2023 as the International Day of Education, especially focusing on Afghan girls and women, and renewed its call to restore their fundamental rights to education (*UNESCO Dedicates*, 2023). Equality in the right to education is of utmost importance, as it ensures that everyone has access to educational opportunities irrespective of their gender or any other parameter. The significance of education in women's empowerment is a widely discussed topic, even in the 21st century. Various regional, social, cultural and religious factors still influence women's access to opportunities to achieve their full potential in life. In the Global Gender Gap Report published by the World Economic Forum in 2023, which examines gender parity in four parameters—economic participation and opportunity, educational attainment, health and political empowerment—the gender gap score for all 146 countries included in the report is 68.4 per cent closed. Since this paper studies the topic of digital education, an examination of the data from the World Economic Forum (2023) report, specifically regarding education disparity, reveals that the educational attainment gap has narrowed by 95.2 per cent. This percentage is significantly higher than the closure rates observed for other parameters analysed. At the current rate of progress over the 2006–2023 span, it is projected that it will take 16 years to close the education attainment gender gap. This measure is a global report that analyses data from countries with high accessibility to education opportunities and data from countries with significantly lower accessibility to educational opportunities together. So, this paper argues that while it is reported that the

education attainment gap has been closed by 95.2 per cent in the analysis of 146 countries worldwide, there will still be regions where women have limited access to educational opportunities for various reasons. Digital education is a new avenue for accessing educational opportunities, offering a much wider scope to access educational systems across the globe, even from the convenience of one's home. The purpose of the study's research question, 'How does the digital divide impact the educational attainment required for women's empowerment?' is to examine the relationship between the three terms 'Gender Digital Divide', 'Educational Attainment' and 'Women Empowerment' in the context of India. This study aims to collect data based on responses to survey questionnaires from a random sample of women from various professional, social and religious backgrounds. A comparison will then be made between these responses to analyse the usage of the Internet for education, the social benefits of digital education and the barriers to accessing digital education systems (DES).

II. Literature Review

Gender Divide in Education

Referring to the UN Sustainable Development Goal 4 (SDG-4) (Zawacki-Richter & Jung, 2023), it is suggested that in 2018, there were 773 million illiterate adults globally in terms of reading and writing, with two-thirds of them being women. It also suggested that this issue is not specific to low-income countries alone. In high- to medium-income countries, the difference lies in the fact that the challenges of accessing educational opportunities are experienced by lower socioeconomic groups in society, as opposed to lower-income countries, where the majority of the population faces this issue (United Nations Statistics Division, 2017). The SDG-4, 'Quality Education for 2030', states, 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'. It has been identified that poverty, gender and location of residence all influence the accessibility of education among people. The out-of-school rates are higher for school-aged girls than boys. However, given the chance, female students are found to have better reading proficiency than their male counterparts at the end of primary and lower secondary schools. In other words, even though these girls are capable of learning, there are some factors that influence them to drop out of school. The impact this has on their lives will be so huge that it prevents them from realising their talents and further developing in their lives.

In a study conducted in India, where disparities in availing opportunities are still predominant despite continued efforts by various government bodies and NGOs (Tripathi, 2021), it was found that education helps to eliminate inequalities and improve women's position in the family and society. Among various factors that can impact women's access to education, Reshi et al. (2022) examined key factors such as cultural norms, poverty, discrimination and a lack of resources. They identified that when women have the right access and opportunities for education, they have wider access to participate in various social and economic activities. Even though various modes and levels of education, such as e-learning, online learning and hybrid learning methods, are available, the accessibility of these educational systems plays a key role. Women's access to different education systems may be restricted due to social, cultural and religious factors. In some cases, their right to education may be curtailed by restrictions imposed by others, often without hearing their opinions. In the book, Mukhopadhyay (2021) explained some of the barriers that women in India have to face in a male-oriented social structure. The author refers to these barriers as a sociocultural complex that affects women's lives, their access to education and their educational achievements. This is, in a way, a barrier imposed on women that can have a damaging impact on their empowerment, and they are denied a life of dignity by other forces. The fewer women who are educated, the wider the gap will be for them to participate in other educational and social networking activities that utilise more advanced digital technologies.

Digital Education

The DES has gained a lot of momentum in the past decade or so. Digital learning is widely understood as a type of education that utilises technology for instruction and learning purposes. Even though different forms of digital or internet-based learning, such as e-learning, online learning and hybrid learning, have been used for a long time, there have been difficulties in integrating these forms of learning into educational systems. More focus and attention have been given to traditional classroom-based education. However, the outbreak of coronavirus disease (COVID-19) has shown the world the need for immediate action on the successful integration of digital learning into the education system (Aldhafeeri & Asmaa, 2023). In the past decade or so, the education sector has undergone swift changes due to advancements in technology, particularly using digital technology. With the outbreak of the COVID-19 pandemic, it has become increasingly necessary to accelerate the digitisation of the education system. This is to provide uninterrupted access to educational platforms, especially when traditional avenues of education are under lockdown. The worldwide growth of educational platforms has greatly accelerated since the outbreak of COVID-19, and educational practices are undergoing significant changes under the influence of these digital platforms (Decuypere et al., 2021). Digital learning has become a prevalent mode of education during the COVID-19 pandemic, not only for schools and colleges but

also in higher education institutions, including medical schools and research studies. It is clear that not all subjects can be studied in a digital mode of education. However, during the pandemic, numerous ways have been developed and used, which has paved the way for a new education system for years to come. As the saying goes, 'necessity is the mother of invention; many inventions on digital platforms and the adoption of social media came into use during this period'. This has opened up new avenues for education in the years to come, even after the impact of the COVID-19 pandemic has been reduced.

Kalolo (2019) conducted a study on the increasing use of digital technologies for education in developing countries, where infrastructural and resource challenges are mostly faced. The study suggested that the selection of different technologies should be based on how they contribute to improving the education process. This availability of technologies for digital education might have been of great help in maintaining the momentum of education during the COVID-19 pandemic when access to traditional forms of education was unavailable due to social distancing and a months-long quarantine. Strielkowski (2020) referred to this as 'creative destruction' because it enabled the rapid implementation of DES in the fields of academia and higher education. Normally, introducing innovations in this area takes years due to various administrative formalities. These changes in academia and the higher education system, which involve the use of digital technologies, are widely considered suitable for post-pandemic education as well. This 'creative disruption' has created opportunities for 'digital transformation'(Williamson et al., 2021) in education at all levels. The HolonIQ website, which provides data insights into social and environmental systems such as education, healthcare, energy and environmental sustainability, has suggested that in 2020, the education sector spent $27B on digital technologies. They forecast this spending to grow to $404B by 2025 (HolonIQ, 2023). This potential growth opportunity in digital education spending is not only beneficial for creating growth potential for investors, but it also has great social benefits. It can help develop new tools and platforms that are more affordable and accessible in all regions of the world.

Simply making the system available only to developed or wealthy regions will not be able to help bridge the gap in education opportunities worldwide, especially in developing countries. If we also focus on regions or communities where there are limited opportunities for digital education facilities, they will also be able to benefit from these investments in educational technologies. This will greatly assist in their social upbringing. Lack of digital platforms or technologies may not be the only obstacle for people in those regions that hinder their access to or progress in education; instead, there may be different social and cultural barriers. Unless efforts are taken to address these adverse factors, this paper argues that even with increased investments in digital education, individuals who are denied access to wider educational opportunities may still be left behind. That highlights the importance of addressing the disparity in education and reducing the 'digital divide' in accessing digital educational opportunities.

Gender Divide in Digital Education

Even though the DES has gained significant momentum across the globe, there is a noticeable gender divide when it comes to accessing opportunities for digital education. The World Economic Forum (2022), in its article on the digital economy, suggested that to educate and empower women, we must close the digital divide. It highlights three key points: The first point is that women are only half as likely to be online as men, which limits their opportunities to learn things online in least-developed countries. The second point is that the digital divide costs the world billions of dollars in Gross Domestic Product (GDP) every year. The third point suggests that a focused effort by both the public and private sectors can reverse this trend and enable women worldwide to avail of modern technical facilities for education and fulfil their potential. These points highlight the fact that a digital divide exists between men and women even in the 21st century, limiting the learning opportunities for women. Pandit Jawaharlal Nehru, the first Prime Minister of independent India, once said

> '*If you educate a man, you educate an individual; however, if you educate a woman, you educate a whole family'.*

Education is considered a fundamental constitutional right (Engida, 2021) for every individual, as it contributes to both personal and societal growth. Therefore, it is of utmost importance that all educational avenues are accessible to everyone, irrespective of gender, race, colour or any other parameter. As per *Gender Equality* (2023), there are currently 122 million girls and 128 million boys globally who are out of school, and women account for almost two-thirds of adults who are unable to read.

> *'In today's technology-saturated societies, the ability to leverage digital technology is increasingly indispensable to an individual's well-being, on the same plane of necessity as numeracy and literacy. Without the ability to control technology, people risk being controlled by it or isolated from local, national and global communities.*

> *Despite this importance, women and girls are being left behind. Globally, gender gaps in digital skills are growing, despite at least a decade of national and international efforts to close them'.* (*Explore the Policy Paper*, 2019)

It is quite evident that, as technology progresses at a rapid rate, we have entered an era of artificial intelligence (AI). However, the longer it takes to address the digital technology divide in education, the greater the impact on women's employment opportunities and their ability to improve their lives. UNESCO's policy paper suggests that the smaller number of girls and women studying Information and Communication Technology (ICT) in secondary schools and colleges translates into a gender gap in the labour market. It says that globally, women hold only 24 per cent of digital sector jobs, while men are 2.7 times more likely than women to work in this field.

As we stand now in the 21st century, it is quite evident that digital skills are no longer a luxury; rather, they are an essential skill required in our day-to-day lives. All aspects of our lives, such as shopping, banking, government department functions, healthcare and education systems, now rely on digital platforms for day-to-day operations. Lacking the skills to interact with these systems will result in missing the required skills to participate in all aspects of one's personal and social life. Kocdar and Bozkurt (2023) studied the new mode of education called the Open, Distance and Digital Education (ODDE) system, investigated the challenges associated with using this method and proposed mechanisms to support learners in this educational system. ODDE is a system that is meant to be inclusive in nature, inspired by the openness philosophy. It envisions equity, equality and justice for every learner, including those with special needs. In other words, its aim is to ensure that no learner should be left behind, irrespective of their gender, race, special needs or any other factor. If the core principles in ODDE systems are practised, this mode of education will help uplift women's digital skills and reduce the digital divide that exists between men and women, as narrated in the World Economic Forum (2022).

The extent to which digital education reaches different groups of people in our society mainly depends on the digital education strategies practised in different parts of the world. Gabriel et al. (2022) studied digital education strategies across the world, analysed how different public education systems have integrated digital technologies for teaching and learning purposes and highlighted some key areas of focus, including the need to tackle the digital divide. Higher education systems, including medical schools, are using different methods of digital education in areas such as communication skills development. Kyaw et al. (2019) found that a combination of purely digital and traditional modes of education is more effective, as it allows for assisted oral feedback and enhances overall effectiveness. During the COVID-19 pandemic, digital education methods have been implemented in undergraduate nursing and medical intern training. It has been found that these methods are effective in certain subject areas and can be a viable option for the future as well (Hao et al., 2022), with improvements and a hybrid approach used as required.

Criticism of Digital Education

While digitisation has advanced and spread across all areas of our personal and social lives, it is not without drawbacks and criticism. Common criticisms of digital education include the lack of direct face-to-face engagement with fellow students and teachers, which can result in frustration, psychological distress (Saha et al., 2021) and poor educational outcomes. This can be overcome by applying innovative DES that utilises improved communication methods (Aldhafeeri & Asmaa, 2022). This enhanced communication can establish better cooperation among students, leading to improved performance from the learners. Zhao et al. (2022) explained another key issue surrounding digital education: the potential for increased exposure to risks such as harmful content, cyberbullying, age-inappropriate advertising and data misuse that undermines user privacy. They suggested that implanting social responsibility into the DES will help create awareness and vigilance towards these risks. As technological advancements progress and the need of the hour arises to equip the world to reduce the disparity in education, this paper argues that emphasising the drawbacks and refraining from embracing new educational facilities will not benefit society. As suggested by Trisiana (2021), digitisation needs to be aligned with the values of independence, mutual cooperation and creativity when studying remotely from home. The post-pandemic use of a DES, combined with traditional education methods, is already proving that DES, with appropriate security measures and continuous improvement, is the way forward for future education.

Barriers for Women Accessing Digital Education

Even though the COVID-19 pandemic resulted in the adoption of different digital technologies for education, this period clearly exposed the extent of the digital divide in society. This was a global period where the lack of opportunities for digital access, the quality of existing digital systems and the digital gender gap were highlighted (Ancheta-Arrabal et al., 2021). The most impacted individuals were mostly women and children. As

mentioned earlier, during the pandemic period, many essential components of daily life, such as banking, healthcare, shopping, bill payments and social networking, have shifted to digital platforms, and thus accessing these 'e-services' has become mandatory, irrespective of whether one has the necessary skills to adopt them or not.

The absence of education is the root cause of digital exclusion among women, and this lack of education creates barriers to their empowerment, leaving them financially dependent on men (Gupta & Kiran, 2023). Adoption of digital services is primarily influenced by the education level of individuals, while social network adoption is more affected by the age of the individual (Elena-Bucea et al., 2021). This means that individuals with lower levels of education will face more difficulties in adopting these essential digital technologies. Another barrier for uneducated women who lack computer skills or digital devices is their anxiety when interacting with computers and digital devices. For these categories of people, if appropriate coaching is given on digital technologies, they may be able to acquire the necessary skills more easily compared to less educated individuals. Gadi (2021) studied the need for digital training for women's employment in Saudi Arabia and recommended that employers take initiatives to create awareness among women about the importance of vocational and digital training. The government can also support efforts to increase women's participation in vocational and digital training by offering incentive programmes for attending these trainings. Even though this study is focused on Saudi Arabia, this paper suggests that any attempt to help women develop an interest in learning and participate in training programmes would be a positive step forward for any region if it could be adopted.

There is glaring and widespread gender inequality in terms of owning and accessing digital devices and attaining knowledge to use digital devices/platforms for specific purposes. Even though affordability is a key issue for exclusion, there are also significant socio-cultural norms that restrict access for women (Mariscal et al., 2019). In a study from India (Vimalkumar et al., 2021), it was identified that caste, household size, marriage and the presence of digitally divided women in the family influence women's computer self-efficacy (CSE). India is rapidly emerging as a power in digital technologies. Despite the increased opportunities for education and access to digital technologies, the barriers faced by women in India when it comes to digital education highlight the depth of this issue worldwide. These factors, such as caste and marriage, are externally imposed on women, leading them to sacrifice their personal preferences for the sake of family and social norms. In some sections of society or parts of the country, we may see women making significant progress in terms of education and employment, whereas, in other sections or parts, these opportunities are scarce or barely available. These types of disparities observed across South Asia, within each country itself, are mainly attributed to the urban-rural divide, religious and cultural barriers, income inequalities and inappropriate allocation of funds (Vimalkumar et al., 2021) by different government bodies. Having said this, apart from the urban-rural barriers within a city itself, there can be lower-income areas where broadband adoption rates are significantly poor (Reddick et al., 2020). In this case, the main factors causing the digital divide are the social exclusion of marginalised groups and the affordability of digital technologies in different regions. These factors, unless addressed with a clear road map, are a cause for concern. With the rapid pace of technological progress we are currently witnessing, there is a risk that these barriers may be considered social norms and persist unresolved for years to come. This paper suggests that more concentrated efforts are required to spread awareness about the importance of digital education, especially among marginalised groups.

Social Impact of the Digital Divide

Without a doubt, when women and girls are supported in improving their digital skills, it helps empower them to become stronger individuals who can make meaningful contributions to society and the economy. As mentioned before, digital skills are not optional; they are essential for engaging in society and actively participating in political, economic and leadership roles. Without these skills, women lack the ability to compete in the labour market and continue to remain financially dependent on someone else. Without proper digital skills, individuals become unaware of the potential security risks to women's safety, both online and offline. One of the common issues faced during the COVID-19 pandemic is that many outpatient consultations moved online. However, many people struggled to attend these consultations due to either a lack of access to a computer or a lack of the necessary skills to participate in online consultations. This has resulted in the 'unintended but inevitable consequence of fuelling health inequality' (Watts, 2020), not only due to missed online consultations but also due to missed opportunities to access resources, including digital healthcare technologies.

Lack of digital skills adversely impacts women's entrepreneurship. Lack of upgrade in digital and financial literacy impacts the growth potentia for small and medium-scale industries (Fauzi et al., 2020). In today's highly competitive and digitally focused business environment, it is imperative for businesses to position themselves to adopt the evolving changes in digital technologies. Failure to do so may result in struggling to withstand competition in the market and survive in the long term. In brief, these points not only

highlight the personal impact of the digital divide but also emphasise the extent of damage it can create in society in terms of restricting women from contributing to economic and leadership activities and supporting the communities they live in. It is beyond doubt that the digital divide has the potential to fuel inequality in society, impacting both social and personal aspects of life.

III. Research Methodology

This study used a descriptive research design, conducting surveys and interviews based on questionnaires with a random sample of women from various backgrounds in India. A total of 200 Indian women were selected for this survey. Respondents are selected considering different education levels & age groups as in Table 1 and Responses were collected using the parameters listed in Tables 2, 3, 4 and 5. These parameters were identified based on literature reviews and the authors' exposure to India.

IV. Data Analysis and Discussion

Data analysis is categorised into three parts. Part 1 presents the educational grouping and age-wise grouping of the survey participants. Part 2 illustrates the extent of internet usage among different education levels and age groups. Part 3 examines the social impact of the gender divide in digital education and analyses the barriers that women face in attaining digital education.

As shown in Table 1, people from different educational backgrounds and age groups were selected to ensure a comprehensive representation of the data for this study. A total of 43 per cent of the participants have a graduation or higher education level, and 29 per cent of the respondents fall within the 40–50 age group. An attempt was made to ensure good representation across all age groups and educational levels among the 200 respondents who participated in this survey.

Table 1: Education and Age Profile of Survey Respondents

Factors	Category	Total people surveyed	%
Education levels	Graduation and above	85	43
	Plus 2 / Pre-Degree / A Level	43	22
	10th standard	35	18
	Below 10th standard	37	19
	Totals	**200**	**100**
Age group (years)	Below 20	35	18
	20–30	26	13
	30–40	45	23
	40–50	58	29
	50 and above	36	18
	Totals	**200**	**100**

Data on internet usage were collected from all 200 respondents, categorised by education (Table 2) and age group (Table 3). Table 2 shows the number of people who indicated using the internet for Facebook, YouTube, Google Search, education-related and work purposes, categorised by education level. It is important to note that a person may use the internet for one or more of these activities, or they may not engage in any of them. Similarly, Table 3 shows that the same data is collected within each age group. The commonly known uses of the internet for accessing Facebook, WhatsApp, YouTube, Google search and educational purpose are analysed in this survey.

Table 2: Internet Usage Against Education Level

Factors	Category	Total Count	Facebook		Whatsapp		YouTube/Films		Google Search		Educaton Related		Work Related	
			No	%	No	%	No	%	No	%	No	%	No	%
Education levels	Graduation and above	85	45	52.94	65	76.47	35	41.18	35	41.18	32	37.65	35	41.18
	Plus 2 / Pre-Degree /	43	28	65.12	32	74.42	23	53.49	15	34.88	16	37.21	12	27.91
	10th standard	35	15	42.86	25	71.43	16	45.71	18	51.43	12	34.29	14	40.00
	Below 10th standard	37	10	27.03	18	48.65	15	40.54	8	21.62	10	27.03	6	16.22

(Note: N – Number of people who responded, % – Percentage)

Table 3: Internet Usage Against Age Groups

Factors	Category	Total Count	Facebook		Whatsapp		YouTube/Films		Google Search		Educaton Related		Work Related	
			No	%	No	%	No	%	No	%	No	%	No	%
Education levels	Below 20	35	30	85.71	32	91.43	32	91.43	30	85.71	28	80.00	12	34.29
	20–30	26	20	76.92	23	88.46	23	88.46	18	69.23	16	61.54	12	46.15
	30–40	45	20	44.44	25	55.56	16	35.56	18	40.00	12	26.67	14	31.11
	40–50	58	10	17.24	18	31.03	15	25.86	8	13.79	10	17.24	6	10.34
	50 and above	36	8	22.22	20	55.56	14	38.89	12	33.33	14	38.89	8	22.22

(Note: N – Number of people who responded, % – Percentage)

The next set of data was collected for six parameters, each for 'impact of digital education: improvement' (Tables 4 & 6) and 'barriers to digital education: problems' (Tables 5 & 7). These parameters are identified based on the information gathered from the literature reviews. For Table 4, responses are grouped into four categories: good, moderate, no change and worse. The total number of people who responded for each category is assigned a weight of 4, 3, 2 and 1, respectively. The higher the total score, the more the survey participants express the improvements achieved in these six parameters because of digital education. Table 6 summarises the mean total score for this measure.

The same is the case with 'barriers to digital education' (Table 5), with the exception that the higher the score, the greater the number of respondents, indicating that these barriers still exist in society. Table 7 summarises the mean total score of this measure.

Table 4: Social Benefits of Digital Education

Impact of Digital Education	Good			Moderate			No Change			Worse			Total		
	N	%	S	N	%	S	N	%	S	N	%	S	N	%	S
Role in family decision making	81	40.5	324	65	32.5	195	35	17.5	70	19	9.5	19	200	100	608
Freedom to travel	65	32.5	260	65	32.5	195	35	17.5	70	35	18	35	200	100	560
Use of bank account	88	44	352	52	26	156	22	11	44	38	19	38	200	100	590
use of smartphone	145	72.5	580	45	22.5	135	6	3	12	4	2	4	200	100	731
House or land ownership	85	42.5	340	32	16	96	55	27.5	110	28	14	28	200	100	574
Medical treatment barrier	62	31	248	92	46	276	32	16	64	14	7	14	200	100	602

Note: N – Number of people who responded, % – Percentage, S – Score (Good – 4, Moderate– 3, No change – 2, Worse – 1)

Table 5: Barriers to Digital Education: Problems

Barriers to Digital Education	High			Moderate			No Change			Worse			Total		
	N	%	S	N	%	S	N	%	S	N	%	S	N	%	S
Family income	81	40.5	324	65	32.5	195	35	17.5	70	19	9.5	19	200	100	608
Social/cultural/religious barriers	98	49	392	65	32.5	195	29	14.5	58	8	4	8	200	100	653
The attitude that women are homemakers	120	60	480	68	34	204	8	4	16	4	2	4	200	100	704
Lack of education	145	72.5	580	45	22.5	135	6	3	12	4	2	4	200	100	731
Computer phobia	85	42.5	340	32	16	96	55	27.5	110	28	14	28	200	100	574
Lack of broadband facilities	98	49	392	86	43	258	10	5	20	6	3	6	200	100	676

Note: N – Number of people who responded, % – Percentage, S – Score (Good – 4, Moderate– 3, No change – 2, Worse – 1)

Table 6: Mean: Social Benefits of Digital Education

Social Benefit of Digital Education	Mean
Role in family decision making	3.04
Freedom to travel	2.80
Use of bank account	2.95
Use of smartphone	3.66
House or land ownership	2.87
Medical treatment access	3.01

Table 7: Mean: Barriers Causing Digital Divide

Barriers Causing Digital Divide	Mean
Family income	3.12
Social/cultural/religious barriers	3.38
The attitude that women are homemakers	3.50
Lack of education	3.13
Computer phobia	2.25
Lack of broadband facilities	3.30

Analysing the mean values for the social benefit of digital education, we can see that 'role in family decision making', 'use of smartphones' and 'medical treatment access' received a mean score above three. This shows that these areas have improved with the availability of digital education opportunities. At the same time, 'freedom to travel', 'use of smartphones' and 'house or land ownership' are slightly above 2.5, which indicates that even with digital education, these areas still require improvements. While there have been improvements in three of the parameters surveyed for social benefit (Role in family decision making, Use of smart phone, Medical treatment access), improvements are still required in the remaining three parameters surveyed in this study. The reason why even with digital education, these parameters 'freedom to travel', 'use of bank account' and 'house or land ownership' are getting poor improvement ratings can be attributed to the barriers that prevent women from accessing certain opportunities to progress in their lives, even if they wish to do so. For example, when it comes to the 'freedom to travel', women may encounter safety and security issues when travelling alone, especially at night. These concerns can impose some constraints on their ability to travel. Similarly, the case is true for the 'use of bank accounts'. If women are not economically empowered, they may not be involved in any financial or banking transactions. Additionally, with regards to 'house and land ownership', men being the main breadwinners in a family may limit the opportunities for women to own or co-own a house or land in India's social system. So, there are certain areas where we can clearly see improvements with digital education, whereas there are social or cultural barriers that hinder progress in other areas.

Of the six barriers surveyed, computer phobia is the lowest-rated barrier that prevents women from accessing digital education opportunities. Among the other five parameters, the topmost barrier is identified as the 'attitude that women are homemakers', followed by 'social/cultural/religious barriers', 'lack of broadband facilities', 'lack of education' and 'family income'. Even though there may be additional barriers for women to access digital educational opportunities, the six barriers surveyed in this study were rated as important by the respondents.

V. Conclusion

This study aims to analyse how the gender digital divide impacts the educational attainment required for women's empowerment. It surveyed 200 women from different educational backgrounds and age groups. With the expansion of digital technologies and growing industrialisation in India, especially in the field of digital technology, this study considers India to be a good representation of the world, especially among developing countries. In a country where manufacturing facilities for semiconductors, mobile phones, computers and laptops are rising, equal importance is being placed on educating people at various levels in digital technology. It is evident that opportunities are increasing. On the other hand, taking the example of the 'use of bank account' analysed above, even though India is taking various initiatives to uplift women by directly crediting their government grants into their bank accounts, which in turn forces them to open a bank account and enables them to use digital services, these efforts have not reached all women. This paper further highlights the importance of addressing barriers that prevent women from accessing digital educational systems. In other words, it shows that the availability of technologies or digital educational systems is not the only reason for the gender digital divide. Rather, accessibility and the right social environment are also required to close the gender digital divide. Wider social concepts that portray women as homemakers, along with social, cultural and religious factors, often lead people to underestimate the importance of women empowering themselves and those around them through access to the wider opportunities provided by digital education.

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