Digital India

by Shiney Chakraborty

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Abstract

According to the UN High-level Panel Report (2017), all over the world women are 14 percent less likely to own a mobile phone and women have 12 percent lower access to the Internet than men. In India, the gap is even more pronounced because women are 46 percent less likely to own a mobile phone and there is also a digital divide between rural and urban areas. However, there is no official gender-wise disaggregated data on access to mobile phones and the Internet and against this backdrop, the paper investigates the gender-segregated employment pattern and wages in the Information and Communication Technology (ICT) industry by using the Employment and Unemployment schedule of the NSSO (68th Round, 2011-12). Using personal interviews and focus group discussions (FGDs) in Delhi during 2018, the paper tries to capture the benefits of digital technologies among female informal workers and in young girls' lives. The paper concludes that education plays an important role in getting jobs in the ICT sector and recommends the need for state intervention in providing women with improved access to digital technologies.

1 Introduction

The United Nations adopted 'Inclusive and Sustainable Growth' as a 2030 Agenda for Sustainable Development and identified gender equality by closing gender gaps at work as one of the central SDG goals (SDG 5). In order to translate these from UN documents to people's lives, the United Nation's Secretary General setup a High-Level Panel (UNHLP) on Women's Economic Empowerment in 2016. The panel aimed to address the specific economic issues of women and to ensure that no one is left behind in the implementation of the 2030 Agenda for Sustainable Development. The panel outlined four systematic constraints on the economic empowerment of women: adverse social prejudices, discriminatory laws and gaps in legal protection, failure to recognise, reduce and redistribute the huge burden of unpaid care and lack of access to financial, digital and property assets. It also identified seven primary drivers of women's economic empowerment, one of which is building assets-digital, financial and property.

Increasing access to digital inclusion is expected to accelerate women's economic empowerment (UN Secretary-General's High-Level Panel on Women's Economic Empowerment, 2016).[2] For example, the World Bank predicts that in emerging economies, annual economic growth will increase additionally by 1.2 percent with a 10 percent increase in mobile penetration.[3] However, access to digital technologies is not equally distributed and varies substantially between regions, within regions and even within countries. At the same time, all over the world, there is a large, persistent gender difference in access to digital technologies, which constrains women's economic opportunities and outcomes. If not addressed, existing gender gaps in digital technologies are likely to lead to larger gender inequalities

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[2] https://www.empowerwomen.org/-/media/files/un%20women/empowerwomen/resources/hlp%20briefs/unhlp%20full%20report.pdf?la=en

[3] http://www.w20-germany.org/fileadmin/user_upload/documents/BDGG-Brochure-Web-ENGLISH.pdf

in education and professional training, low financial inclusion of women and less scope for decent job opportunities in the labour market.

Digital technologies empower the lives of the people who have access to them and those with little or no access face social and economic inequalities. However, according to the UNHLP Report (2017), worldwide nearly 2.3 billion women do not have Internet access and more than 1.7 billion women do not own a mobile phone. Lack of access to digital technology and the absence of digital literacy skill exaggerate the gender divide further in developing countries like India (Subramanian, 2017). However, to understand the digital gender divide, one needs to go beyond economic factors, because socio-cultural values restrict and discourage women's access to and use of technologies. The gender gap in access to digital technology originates from education and income inequality, and to enable digital technology to act not only as a tool but also as a means of empowerment, gender-sensitive approaches need to be built into policy and programme design (Gurumurthy and Chami, 2014).

Some studies have pointed to the benefits of information and communication technologies (ICTs) in women's lives both at the household level and at their workplace (Kelkar and Nathan, 2002; Lee, 2004), but other studies are sceptical about the masculine nature of ICTs, patriarchal structure and unequal gendered access to modern technology. (Ghosh, 2004; Gothoskar, 2000). Digital technologies can empower women by increasing their awareness, strengthening their social networks and providing them with greater socio-economic opportunities. So, enabling equal access to technology has caught the attention of policymakers worldwide. Though the digital divide has been widely acknowledged for a long time, more recently the phrase has gained momentum in various national and international documents. OECD (2001) defined the digital divide as "the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies and to their use of the Internet for a wide variety of activities" (p. 5). It is assumed that digital inclusion can empower women not only by improving their individual agency but also by dismantling other societal norms surrounding gender. For example, based on the National Family Health Survey cross-sectional data (2004-05), Lee (2009) found that access to mobile phones reduced tolerance for domestic violence and increased women's autonomy in mobility and economic independence. The

author recommends that India and other developing countries should consider mobile phones as an empowering instrument for women.

However, in terms of access to digital technologies women are 14 percent less likely than men to own a mobile phone and the gender gap in Internet access is 23 percent across the globe (UNHLP Report 2017). Moreover, in South Asia, there is a much higher gender gap (38 percent) in mobile phone ownership and in India women are 46 percent less likely to own a mobile phone and the gender divide in Internet usage is 57 percent (LIRNEasia, 2018). LIRNEasia, (2018) study also reports that rural-urban and male-female gaps in mobile ownership are the highest in India relative to other Asian countries such as Bangladesh, Cambodia and Pakistan. According to the Group Special Mobile Association (GSMA) 2018 report on the mobile economy,13 percent of female mobile phone owners in India had used Internet in their mobile phones in the past three months compared to 31percent of males. This digital gender divide can have a far-reaching inequality-increasing impact that is brought out by a few studies.

Google, in partnership with Tata Trust, launched the Internet Saathi Programme in July 2015 to create digitally-enabled livelihood opportunities for rural women. It was launched as a pilot in Rajasthan and will be expanded to Haryana and Bihar. Under this programme, rural women learn how to access and use the Internet and then they train other women of their community and neighbouring villages. So far, Internet Saathi has given training to 45,000 women across 150,000 villages who further reached out to 1.5 million women.[4] Internet Saathi helps women find new job opportunities and improved techniques related to their field, and there are many success stories of the Internet Saathi programme.[5]

Akshaya (Reforming Kerala through Digitization) is a project initiated by the Kerala state government that aims to bridge the digital divide by bringing the benefits of technology to households. It was started in Malappuram district of Kerala and later expanded to other districts. Though the project aimed at entrepreneurship development and e-training for all, a study by the Institute of Social Studies Trust (Mukhopadhyay and Nandi, 2006) found unequal gendered outcomes. Among the Akshaya entrepreneurs, financial benefits acted as a major propeller for men while

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[4] *https://www.google.com/about/values-in-action/internet-saathi/*

[5] *https://www.womenwill.com/india/#_ga=2.75189970.1102102337.1544610904-957921784.1544610904*

women were driven by non-financial motives such as community benefits and their own social standing. Very few women applied to set up Akshaya Centres relative to men and the number of women trainees was also lower than men. Very few trained women opted for the advanced course, whereas more men chose an advanced course for better job opportunities. Women's domestic unpaid work prevented them from long hours of work and they also had high indebtedness (bank loans) because of their lower access to family resources and almost all of them opted for institutional credit while men invested their own capital partially or fully. Most women entrepreneurs did not have any previous experience in business and, unlike men, they always need to take approval from the family to open or run any business. Under the scheme, the entrepreneurs had regular meetings with Akshaya officials, but the invisibility of such gender issues remained. The study highlighted that more awareness and efforts are needed to get the full advantage of the Akshaya project.

In 2012, the Institute of Social Studies Trust conducted a study in rural areas of Punjab and Rajasthan to evaluate the voice message service of IFFCO Kisan Sanchar Limited (IKSL) (ISST 2012). This service provides information on agricultural and non-agricultural issues to rural households through a daily mobile voice message service. The objective is to educate farmers through different promotional activities, computer literacy etc., so that they can use the latest technology to improve their agricultural productivity and increase their income. The study reported that overall use of mobile phone was higher among men than women (71 percent versus 53 percent) and among the IKSL SIM users, only 19 percent were women.

Bhowmick (2018) used an evidence-based randomized evaluation study to argue that mobile-based cash transfer to women in Niger contributed to an increase in the bargaining power of women within the household, improved the dietary intake of the children and increased the cultivation of marginal crops that are grown by women. The study found that mobile money services (like M-Pesa) reduced household poverty by 2 percent in Kenya by developing a saving behaviour among women beneficiaries that may eventually enable them to alter their occupations from subsistence agriculture and part-time jobs to their own entrepreneurship.

Against this backdrop, the paper attempts to highlight the employment pattern and wages in the Information and Communication Technology (ICT) industry across locations in India by using the Employment and Unemployment schedule of NSSO quinquennial round (68th Round, 2011-12). The paper also explores the

benefits of digital technologies among women informal workers and young girls' lives in Delhi during September-October 2018. The study examines the use of modern technologies by women workers to increase access to markets and to gain dignity in their lives and how young girls use digital technologies to enhance their career prospects.

The rest of the paper is structured as follows. Section II discusses the methodology used in this study while the next section focuses on the need to highlight the informal sector as the majority of workers particularly women are employed in the informal sector in India. Section IV examines gender-wise access to ICTs in India and highlights the existing gender and rural-urban divide. Section V analyses the employment pattern and wages of women workers in the ICT industry and the next section provides some examples of digital usage in India. Section VII provides conclusions and policy recommendations.

2 Methodology

The study uses a mixed approach-both quantitative and qualitative to focus on the employment pattern and wages in the ICT industry and the benefits of digital technologies in women's daily life. The available reports of the Department of Telecommunication provide only aggregate telecom statistics in India and there is no official gender-wise disaggregated data on access to mobile phones and the Internet. So, the study uses the Employment and Unemployment schedule of NSSO (68th Round, 2011-12) to investigate the gender-segregated employment pattern and wages in the Information and Communication Technology (ICT) industry in rural and urban areas. Further, to substantiate and strengthen the need for digital technologies in empowering women and to capture nuances (such as access and use of digital technologies like smart phones and computers) that the quantitative data are unable to provide, the study uses a qualitative approach (both personal interviews and focus group discussions [FGDs]) in different parts of Delhi during September-October 2018.

The next section highlights the informal nature in the Indian labour market, which is one of the reasons why the study has focused on women informal workers.

3 Informal Nature of the Indian Labour Market

Informality is an overarching characteristic of the Indian labour market with around 95 percent of workers in this sector. Informal sector enterprises are defined as unincorporated enterprises, (i.e., proprietary and partnership enterprises including the informal producers' cooperatives) in the conceptual framework of the 15th International Conference of Labour Statisticians (ICLS). NSSO identifies the informal sector as consisting of proprietary and partnership enterprises (excluding those run by non-corporate entities such as cooperatives, trusts and non-profit institutions) in the non-agriculture sector and in agriculture-related activities excluding crop production (AGEGC) (NSSO 2014). Using this definition of the informal sector, the NSSO estimated women employment in the informal sector to be about 73 percent of total usual status employment (principal and subsidiary) in rural areas and 64 percent in urban areas in 2011-12 (Table 1). The figures for informal employment are likely to be even higher because enterprises identified as "employer's households", which account for employment like the provision of domestic services, are excluded from the definition of the informal sector.

Table 1: Informal Sector enterprises among workers (ps+ss) engaged in AGEGC and non-agricultural sectors

	61st Round (2004-05)	66th Round (2009-10)	68th Round (2011-12)
Rural Male	79.2	74.2	76.2
Rural Female	86.4	74.4	72.7
Urban Male	73.9	68.5	70.4
Urban Female	65.4	61.6	63.6
Total Male	76.7	71.5	73.4
Total Female	79.7	69.8	69.2

Source: NSS Report No. 557(68/10/2)

Note: AGEGC and non-agriculture sectors: Industry groups/ divisions 014, 016, 017, 02-99 of NIC-2008.

In proprietary enterprises, about 43 percent of male workers are engaged compared to female workers (23 percent), whereas in partnership enterprises female workers share a higher proportion (about 25 percent) compared to male workers (10 percent). For all workers, the sub-sectors that account for a dominant share of informal sector employment are manufacturing, construction and trade (wholesale and retail). They accounted for 76 percent and 68 percent, respectively, of all workers in the non-agriculture informal sector in rural and urban areas compared to 71 percent and 56 percent respectively, of all workers in the non-agriculture sector. Within this broader context of informalisation, the next section examines how access to digital technologies may change the scope of employment opportunities in the labour market with special focus on women.

4 Access to Digital Technologies in India

India's growing digital landscape offers tremendous scope for women's empowerment. Realising the pressing need to extend access to ICT, the Government of India launched the Digital India programme on July 2nd, 2015 and since then many initiatives have been taken up. A major effort has been initiated to improve the digital infrastructure, empower citizens digitally and provide governance and services digitally on the basis of demand, even in rural areas.

Despite these efforts, the digital gap in India is still present because of limited access to digital resources and an absence of digital literacy. More than half the population of India is not aware of the Internet and only 19 percent of the population uses it. Internet usage in India is closely associated with social media use and only 10 percent uses it for work. Similarly, in other countries social networking is the major reason for Internet usage and the use of 'utilitarian' apps (e.g., education, trading, transportation, etc.) was less prevalent among Indian users than in other developing countries like Guatemala, Ghana and Cambodia. In terms of awareness and use for buying and selling goods and services (through platforms such as Amazon, Ali Baba and eBay), tickets and appointments, and transport and ride sharing apps, India had the highest number of users in Asia. But lack of need, unwillingness to share details with third parties, concerns about the quality of the products and lack of knowledge are the main reasons behind the non-use of e-commerce platforms and similarly, lack of need and lack of knowledge are the reasons for non-use in selling through Internet-based platforms.

With the expansion of the gig economy, new employment opportunities are being generated. In India multinational companies and large firms have embraced the concept of gig economy rapidly, but start-ups were the early adopters. However, the scope for high-skilled freelancers is limited relative to low-skilled freelancers (Kathuria et al., 2017). Under the gig economy workers are termed as "liquid workforce" because there is no fixed term benefit and workers are given short-

term contracts. They are independent contractors and freelancers instead of full-time employees. Digitisation and information technology have played a seminal role and have transformed the Indian market with the emergence of several business models such as Uber, Ola, AirBnB, OLX, Quikr, UrbanClap and Magic bricks. These applications generate employment for drivers, cleaners, gardeners, house-keepers, electricians, plumbers, carpenters, beauticians, teachers, air conditioning technicians and other tradespersons. The gig economy opens new opportunities for women because they can balance their work life and family and so in India, 58 percent of gig economy professionals are women.[6] But a traditional mindset and the lack of networking platforms act as barriers in embracing the gig economy and women are the worst sufferers.[7]

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[6] *http://www.uniindia.com/58-successful-gig-economy-professionals-are-women-study/business-economy/ news/1344476.html*

[7] *https://www.livemint.com/Leisure/qf1QegSFh1d1uf82sZzWUL/Midlevel-women-executives-and-the-Indian- gig-economy.html*

5 Gender-wise Employment and Wages in the ICT Sector

This section examines gender and rural-urban segregation in employment and wages in the ICT sector during 2011-12 by using the NSSO Employment and Unemployment schedule. The study considers all workers (combining regular salaried and casual wage labourers) in the 15-59 age group (unless otherwise specified) according to the usual status approach, which is principal status [ps] + subsidiary status [ss]. Daily wages are computed by dividing the total weekly wage (combining both cash and in kind) by total days worked in a week. Since unreasonably high or low wage rates can distort the results, outliers are omitted from the distribution of wage rate by applying the appropriate methodology.[8] Earnings refer to the wages or salary that is received for the wage or salaried work done during the reference week by the wage earner (wage/salaried employee and casual labourers).

Following the OECD classification (1998) the study defines the ICT sector as a combination of manufacturing and services industries that capture, transmit and display data and information electronically. The study classifies ICT into four categories: manufacturing, trade, telecommunications, information technology (IT) and Information Technology-Enabled Services (ITeS). It compares the results with non-ICT industries in both rural and urban areas.

Table 2 shows that the ICT sector is predominantly urban-based; it is dominated by men and it provided employment to only a few women.

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[8] *To omit outliers from the distribution of wage rate, two order-based summary statistics, namely, first quartile (Q1) and third quartile (Q3), are calculated in order to calculate the inter-quartile range (IQR) which is the difference between Q3 and Q1. According to the exploratory data analysis approach, any value of wage rate that is lower than Q1-1.5xIQR or higher than Q3+1.5xIQR can be considered as mild outliers. Similarly, any value of wage rate which is lower than Q1-3×IQR or higher than Q3+3×IQR can be considered as strong outliers. In this study,the strong outlier approach has been applied.*

## Table 2: Employment profile in ICT Industry (in percentage)

	Rural	Urban	All India
ICT Industry	0.18	1.88	0.67
Non-ICT Industry	99.82	98.12	99.33
	Male	**Female**	**All India**
ICT Industry	1.15	0.17	0.67
Non-ICT Industry	98.85	99.83	99.33

Source: NSSO 68th Round Unit level Data on Employment and Unemployment Schedule.
Note: Activity Status-Usual Status (ps+ss) and Age Group-15-59 Years

A further classification of the ICT sector reveals that in rural areas employment was higher in the trade sector, while in urban areas IT and ITeS had substantial employment opportunities (Figure 1). Within the ICT sector, the proportion of employment was the highest in IT/ITeS both for men and women in 2011-12. Education played an important role in employment in the ICT sector in both rural and urban areas. In rural areas, both men and women have secondary school certificates or higher, while in urban areas 58 percent men and 76 percent of women have a BA degree or higher qualification and they are mainly involved in IT/ITeS services as call centre executives or tele-callers.

Figure 1: Sector-wise employment within the ICT sector
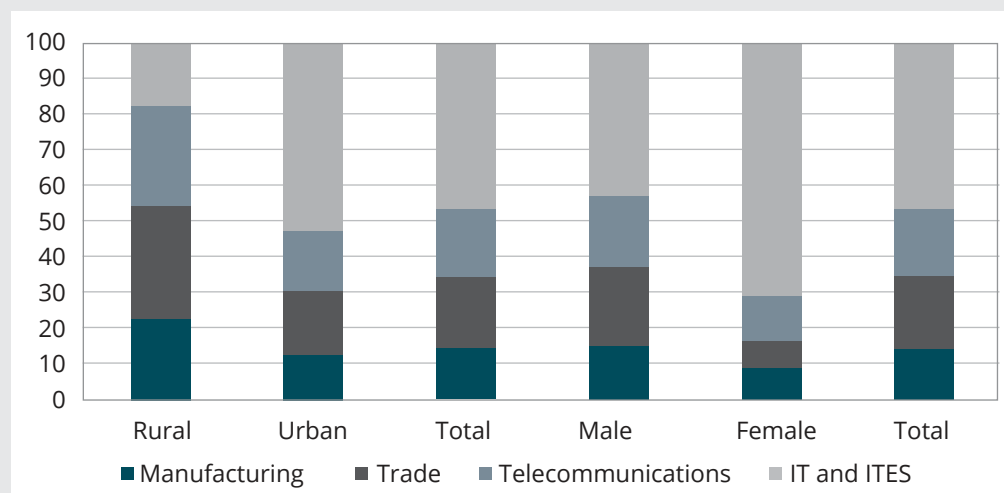
Source: NSS Report No. 557(68/10/2)
Note: AGEGC and non-agriculture sectors: Industry groups/ divisions 014, 016, 017, 02-99 of NIC-2008.

The ICT industry can also be examined in terms of how it operates in the formal versus informal sectors. According to the 68th Round of the NSSO, in contrast to the non-ICT industry, the proportion of formal employment was higher in the ICT industry in 2011-12. Within the ICT industry, formal sector employment was the highest in IT/ITeS, whereas trade employed the highest number of informal workers. It was also observed that within the manufacturing and trade sector in ICT, the proportion of self-employed and unpaid family workers was higher, whereas telecommunications and IT/ITeS largely employed wage employees in 2011-12.

Table 3: Formal and Informal Sector Employment in ICT and Non-ICT Industries (2011-12)

	Informal Sector	Formal Sector	Total
ICT Industry	1.34 (25.26)	3.81 (74.74)	5.15 (100)
Non-ICT Industry	202.02 (62.37)	111.38 (37.63)	313.40 (100)
Total	203.36 (61.72)	115.18 (38.28)	318.55 (100)

Source: NSS Report No. 557(68/10/2)

Note: Values are in millions; values in parentheses are percentages.

Finally, average daily wage rates are calculated and presented in Table 4. It shows that the rural-urban gap in wages was higher in the ICT industry relative to the gender wage gap. However, the gender gap in wages was higher in non-ICT industries than in the ICT industry. Across locations, the gender wage gap was higher in the rural ICT sector relative to urban areas. The industry-wise division of the ICT sector presents the highest gender wage gap in the telecommunications industry in both rural and urban areas.

Overall, the study indicates that rather than a gender wage gap there was a rural-urban gap in wages in the ICT industry compared to the non-ICT industry. According to workers' educational level, there was a clear segregation of employment in the ICT industry in 2011-12, because with a university degree, workers are hired as IT professionals which are urban-based. The next section presents some observations from the field and highlights the need for digital technologies in empowering women's lives, which the quantitative approach is unable to capture.

Table 4: Average Daily Wage Rate in ICT Industry

	Rural Wage	Urban Wage	Wage Ratio (Rural/ Urban)	Male Wage	Female Wage	Wage Ratio (Female/ Male)
Manufacturing	212.56	374.16	0.57	334.68	345.30	1.03
Trade	151.90	269.66	0.56	237.74	258.26	1.09
Telecommunications	321.78	449.27	0.72	434.82	252.99	0.58
IT and ITeS	381.65	593.21	0.64	574.51	588.54	1.02
ICT industry	285.55	506.96	0.56	469.83	493.00	1.05
Non-ICT industry	170.78	303.04	0.56	231.85	159.15	0.69

Source: NSS Report No. 557(68/10/2)

Note: AGEGC and non-agriculture sectors: Industry groups/ divisions 014, 016, 017, 02-99 of NIC-2008.

6 Illustrative Cases

I t is clear that ICT has opened up a new arena of opportunities to young women who would have otherwise remained unemployed or underemployed despite their relatively high levels of education. Call centres and BPOs provide employment opportunities to a huge number of women workers in India and working conditions in these IT jobs are relatively better than factory work (Mukhopadhyay & Kamble, 2006). But a strict gender division in the distribution of gains is noticed in IT jobs, where a relatively larger number of men are involved in high-end jobs. According to an ILO survey on IT workers in India, the majority of women (60 percent) are clustered in low-paid call center jobs, whereas their proportion in high-paid jobs is lower (Vijayabaskar, Rothboeck & Gayatri, 2001). It was also found that women have lower career opportunities in the IT sector than men (Gothaskar, 2000; Mitter, 2001). This section provides some reflections from field studies in Delhi to highlight the role played by the ICT sector in the overall economic empowerment of women workers.

The Institute of Social Studies Trust jointly with SEWA Bharat and International Innovation Corps (IIC) at the University of Chicago conducted personal interviews in different parts of Delhi to highlight the digital needs and usage of the women informal workers of different backgrounds like street vendors, home-based workers and young girls. The findings from the interviews are given in the Appendix. The women were of different ages, faced constraints in their lives and used technology in some way in their day-to-day life. One of the respondent Sandhya, a home-based worker mentioned.

> *"My son has gifted me a smartphone and now I have to learn the use of this phone. She is also hopeful that within two to four days she will be able to learn about the usage and she believes that she is a quick learner. She mentions that she can take a picture of the sample on which she needs to work and then she can make the design by sitting at home. She can even share the design via WhatsApp with the manager"*
>
> *Interview in Delhi, September 2018.*

Another respondent Sona, a street vendor spoke about how digital technologies ease her burden of work. She explained

> *"After learning how to use WhatsApp now I do not carry all the utensils to the clients use. Clients share their choice of utensils with me and I only carry that particular utensil with me"*
>
> *Interview at Raghubirnagar, Delhi, September 2018*

In another effort, the Institute of Social Studies Trust tried to capture the benefits of digital technologies in young girls' lives through an FGD with nine young girls at the Saathi Community Centre (Action Research Centre of Institute of Social Studies Trust) in Kalyanpuri. These girls study arts and commerce in Classes XI-XII. The Institute of Social Studies Trust along with ETASHA provides them computer training on Microsoft Office, Paint and basic Internet. The study found that they are very interested in this training and are also aware of the positive effects of technologies. They want to use digital technology for their safety because they have been told that they can use Google Maps to locate their destination when they travel alone. They also want to use the Internet to fill forms for online jobs and can apply for online courses to improve their career prospects. Though they do not have smartphones, whenever they get access to smart phones they watch YouTube and use WhatsApp for studies. They have separate groups for each subject, communicate with their friends and seek help from their teachers. They use apps like TikTok for entertainment.[9] But still there are socio-cultural norms governing the decisions of whether women should use digital technologies, which emerged during the FGD. A few of them mentioned:

> *"Apart from the negative effects of using smartphone or internet there are various benefits of it but still their parents scolded them when they took the smartphones from their parents or their brothers. But when their brothers use it they never said anything to them not even to younger brothers."*
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> *FGD with young girls at Kalyanpuri, Delhi, October 2018)*

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[9] *TikTok is a social media app for creating and sharing music videos with friends and followers as well as live broadcasting.*

Figure 2: Girls using computers at the ISST, Community Centre Kalyanpuri.

Note: Figure describes the uses of digital technologies by the girls at ISST Community Centre. Kalyanpuri, October 2018

To address the constraints they face and to improve their skill level, state intervention and the involvement of local bodies are needed. Information on skill training and the contact details of the concerned persons need to be disseminated. Further after the skill training, technology can guide them to find suitable employment and so infrastructure like the Internet and mobile connectivity need to be improved for better access. There is a need to expand the geography of opportunities for girls in cities and communities by providing access to safe public transport and convincing families about the benefits of technology through campaigns. There should be a focus on building more community learning centres (computer centres) and providing opportunities to women informal workers, housewives and older women to use technology for learning. At the same time, there is a need to improve access, reduce the cost of Internet and mobile connections, and change social norms in access to digital technology by girls. More campaigns are required to highlight the advantages of digital aspects in people's lives and opening up of physical centers will also enable people to start digital learning.

7 Conclusion

I t is well acknowledged that given the ongoing digital transformation reducing the gender divide in access to and use of ICT will strengthen the position of women in the labour market. More flexible ways of working may make it easier to combine paid work with unpaid work, which is still more often taken on by women. However, a closer look at the evidence suggests a mixed picture. Women may gain benefits from increased flexibility in working hours but it may also hamper the quality of jobs. In spite of the various gender-neutral initiatives taken for digitization, women still lag behind because of the prevalent language barrier, complex user interface, and more specifically the widespread prevalence of social prejudices. In rural areas in India, men deny women access to the Internet because they believe it is a bad influence. So, market-led expansion alone is insufficient to close the digital divide in gender and it is still beyond the reach of the majority of women. Internet access does not always bring gains for women; the underlying gender divide in education and income acts as a barrier to women. So, further research is needed to identify the existence of social prejudices faced by women. There is also a need for research on existing/new data gaps on access to mobiles and the Internet and research collaboration is needed. Research is also needed to evaluate the impact of app-based learning/training for women in the informal sector. Similarly, access to digital technologies relies on physical factors like uninterrupted power supply and affordable price of technology, so special emphasis is required to improve these.

8 Appendix

Role of Digital Technologies in Women's Lives in Delhi

Sona Ben, Street Vendor: Sona, a street vendor, migrated to Delhi after her marriage. She is a 35-year-old widow and lives with her son in a house given by her mother-in-law, who is very supportive. She trades utensils for old clothes and travels to various parts of Delhi. This is a common occupation among the poor Gujarati women of Raghubirnagar in West Delhi. They clean and iron the used clothes and make them ready for sale in Delhi's Mahila Bazaar. But they face various challenges in this work. Since they have to meet their clients (households), they need to carry the heavy utensils on their heads, which prevents them from travelling on the metro or using other public transport. Not being sure which utensils, a household is going to select, they carry all the utensils. Sometimes, the Resident Welfare Association (RWA) of a society prevents them from entering the premises. But with the help of digital technology (like WhatsApp), she started to ask her clients about their preferred utensils, clicked photos of the utensils and shared them with her customers. Customers can choose the utensils from the photos and she carries only the selected product, which reduces her burden. In return, customers also click photos of their old clothes and share it with her and she manages to negotiate a fair price for the utensils on the app itself. The use of WhatsApp saves her travel time, travel cost and physical effort in carrying a huge number of utensils. SEWA has played an important role in her life by building a savings attitude and providing loans at low interest rates.

Sandhya Ben, Home-Based Worker: Sandhya migrated to Delhi after marriage. After her children grew up she wanted to explore new income avenues. She tried to learn painting but did not like it and then she started sewing and embroidery. Now, she sews and embroiders bags and pillowcases that she sells at the SEWA Centre at a piece rate for an export house. The advent of digital technology especially WhatsApp makes her life easier. She uses WhatsApp to download images of the

designs on which she needs to work, so she does not need to memorize the designs. After doing the work, she shares the pictures via WhatsApp with the employer. Since her children have grown up, she is able to spend more time on paid work but other women face issues of unpaid care work and more focus is needed to build crèches. She is an active member of a women's cooperative for skilled artisans who are home-based workers. She bought a laptop for her children and also bought few household appliances for herself. She makes video calls to her parents and her in-laws to keep in touch with her family in Uttar Pradesh since she visits her family only once a year. She is aware of her finances because her mobile number is linked with the bank account, so she receives an SMS from the bank.

Santoshi, Student, Tutor: Santoshi is a student of Class 12. She has three siblings and given the low family income she never asks for money from her parents. To challenge her father's belief that she will not have a good career because she chose the wrong subject (Sanskrit), she decided to provide tuition to children in her neighbourhood. Since she does not know how to teach, she gets online help and uses YouTube to explain concepts to her students. She encourages her students to ask questions. Her father strongly believes that a good education will enable her to secure a good job in Delhi.

Pooja, Student: Pooja is 15 years old and lives with her family close to Dadri. Her aim is to become an engineer and invent new things. She loves to study mathematics and science but because of her low marks, she was forced to take humanities. Still, she reads science textbooks and is passionate about science. She cycles 40 km to reach the SEWA centre and learns computer applications there. She seeks help from YouTube in her studies and clears her doubts by asking questions in the comments section. She dreams of creating her own YouTube channel and wants to become an engineer. She wants to open a coaching institute in her village.

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