



Leveraging Technology for Social Impact:

Enhancing Interventions for Women's Empowerment in Rural India

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The authors are students of the Young Researchers for Social Impact (YRSI) Program conducted by Young Leaders for Active Citizenship (YLAC). YRSI identifies promising high schoolers and builds their capacity as critical thinkers and problem solvers to produce thought-provoking solutions to pressing issues that affect our societies today. This study was undertaken as part of the 2023 edition of the program.

Disclaimer: The views expressed in this study are solely those of the authors, and do not represent the views of YLAC as an organisation.

TABLE OF CONTENTS

1. Introduction	2
1.1 The Digital Gender Divide in Rural India:	3
a) Limited Digital Infrastructure:	3
b) Gender Disparities in Mobile Phone Ownership:	3
c) Access to Digital Skills and Literacy:	3
2. Understanding Mobile Phone Usage and Digital Access among Rural Women in India	3
2.1 Quantitative Findings	4
2.2 Qualitative Findings	4
3. International Best Practices	5
3.1 Mexico and Latin American Countries	5
3.2 Bangladesh	6
3.3 Ghana and other African Nations	6
3.4 Global Concerns for Women around the Use of Technology	7
4. Technologies for social empowerment	7
4.1 Audio-based technology	7
4.2 Visual-based technologies	8
4.3 Social Media, Messaging and Translation	8
4.4 Fintech platforms	8
4.5 Assessing its potential and risks	9
5. Policies and Schemes in India and Gaps	10
5.1 Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA)	11
5.2 Digital Shakti Campaign	11
5.3 Technology Development and Utilisation Programme for Women (TDUPW)	11
5.4 Skill India Mission	12
5.5 National Digital Literacy Mission	13
6. Recommendations for the Nudge Foundation	13
6.1 Short-Term Recommendations	14
a) Prioritise Audio-based Solutions for Information Dissemination:	14
b) Collaborate with Messaging and Networking Apps:	14
d) Foster Local Community Engagement and Leadership:	14
6.2 Long-Term Recommendations	14
a) Develop Engaging Visual-based Educational Content:	14
b) Facilitate Financial Inclusion with Fintech Solutions:	14
c) Prioritise Cyber Safety and Data Protection:	14
d) Collaborate with Skill India and PMKVY:	15
6.3 Risks and Limitations:	15
a) Digital Divide Persists:	15
b) Social Norms:	15
c) Sustainability Challenges:	15
d) Dependency on Technology:	15
e) Data Privacy Concerns:	16
7. Conclusion	16

1. Introduction

The digital gender divide in rural regions of India has drawn increasing attention due to its implications for women's empowerment and socio-economic development. This literature review aims to provide an overview of the digital access disparities faced by rural women in India and emphasise the importance of digital access for their empowerment. We will explore the current state of the digital gender divide and its implications for rural women's empowerment by drawing upon statistical analysis, research findings, and relevant studies.

Access to digital technologies has become increasingly crucial in today's digital era, enabling individuals to connect, access information, and participate in various aspects of life. However, rural areas in India often lack adequate digital infrastructure, including internet connectivity and reliable electricity supply, exacerbating the digital gender divide. The limited digital infrastructure in rural India hampers rural women's ability to access and utilise digital technologies effectively. Moreover, gender disparities in mobile phone ownership further widen the digital divide for rural women. The ownership of mobile phones is essential for accessing digital services, information, and communication platforms. However, data from the National Family Health Survey (NFHS-5) highlights a significant gender gap in mobile phone ownership in rural India, with only 36% of rural women having access to a mobile phone compared to 62% of rural men. This disparity restricts rural women's access to digital resources and opportunities for empowerment.¹

Additionally, access to digital skills and literacy plays a vital role in bridging the digital gender divide. Unfortunately, rural women often face limited opportunities for digital training and education. Studies conducted by the Indian Council for Research on International Economic Relations (ICRIER) reveal that only a small percentage of rural women have received any form of digital training, hindering their ability to fully participate in the digital ecosystem and limiting their empowerment potential.²

Nevertheless, digital access holds immense potential for empowering rural women and promoting their socio-economic development. Through digital technologies, rural women can access educational resources, vocational training programs, and entrepreneurship initiatives, enhancing their skills and employability. Digital platforms also provide opportunities for market information, government schemes, and networking, enabling rural women to expand their economic activities and improve their livelihoods.

By addressing the digital gender divide and ensuring digital access for rural women, policymakers and stakeholders can unlock the potential of rural women, bridge the socio-economic gap, and foster inclusive development. In the following sections, we will delve deeper into the literature to provide a comprehensive understanding of the digital gender divide among rural women in India and rely on data from reports from multilateral institutions, government databases and program dashboards to support our analysis. These databases provide valuable insights into the digital access disparities faced by rural women and the impact of technology-driven programs on their empowerment.

¹ National Family and Health Survey, Pg 590 <https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf>

² Indian Council for Research on International Economic Relations <https://icrier.org/>

1.1 The Digital Gender Divide in Rural India:

a) Limited Digital Infrastructure:

Rural areas in India often lack adequate digital infrastructure, including internet connectivity and reliable electricity supply. According to a report by the Ministry of Electronics and Information Technology (MeitY), only 18% of rural households in India have internet access. This limited digital infrastructure contributes to the digital gender divide, as rural women face challenges in accessing digital technologies and services.

b) Gender Disparities in Mobile Phone Ownership:

Mobile phone ownership is a crucial factor in accessing digital services and information. Digital technologies such as mobile phones have bridged the information gap for rural women, providing them with access to market information and economic opportunities.³ Through digital platforms, rural women can access agricultural market prices, learn about government schemes and subsidies, and explore entrepreneurship possibilities. However, rural women in India experience significant disparities in mobile phone ownership. According to the NFHS-5 data, only 36% of rural women have access to a mobile phone, compared to 62% of rural men. This gender gap in mobile phone ownership further exacerbates the digital divide for rural women.⁴

c) Access to Digital Skills and Literacy:

Digital access can serve as a catalyst for education and skill development among rural women. Studies have shown that when provided with digital devices and internet connectivity, rural women actively engage in educational activities, including accessing online courses and resources. Digital platforms also offer opportunities for skill development, such as vocational training programs and entrepreneurship initiatives, enabling rural women to enhance their employability and income generation potential. However, rural women often lack access to digital training and education. A study conducted by the Indian Council for Research on International Economic Relations (ICRIER) found that only 11% of rural women had received any form of digital training.⁵ This lack of digital skills hinders their ability to fully participate in the digital ecosystem and limits their potential for empowerment.

2. Understanding Mobile Phone Usage and Digital Access among Rural Women in India

Concentrating on two distinct groups – young girls aged 14 to 30 and illiterate rural women aged 30 to 60 in Mahamanna Panchayat, Gaya district, Bihar, India – this study furnishes valuable revelations regarding mobile phone utilisation and digital accessibility. By presenting these key findings, the research paper provides a comprehensive overview of the digital gender divide in rural India and the scope of skill development programs on women's empowerment. It offers valuable insights into the challenges and opportunities faced by women in accessing digital technologies and the potential benefits of enhancing digital literacy in rural areas. The analysis reveals nuanced insights into digital access and usage patterns among illiterate rural women, encompassing age, financial, and caste-related dynamics. Notably, age-

³ OECD Bridging the Gender Divide, Pg 42 <https://www.oecd.org/digital/bridging-the-digital-gender-divide.pdf>

⁴ National Family and Health Survey, Pg 590 <https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf>

⁵ State of India's Digital Economy (SIDE) Report 2023, Pg 53, https://icrier.org/pdf/State_of_India_Digital_Economy_Report_2023.pdf

related adaptation and financial constraints impact digital access, while caste-based barriers highlight the need for inclusive interventions.

However, the study's limited sample size of 50 respondents and its confined geographic focus might curtail the extent of broader generalisations. To achieve a more all-encompassing comprehension of digital engagement, future research endeavours could encompass larger and more diverse respondent pools, spanning wider age spectrums and geographical areas. The incorporation of qualitative methodologies could further enhance insights into the motivations, obstacles, and aspirations of these women, thereby facilitating more finely targeted interventions to promote digital empowerment.

2.1 Quantitative Findings

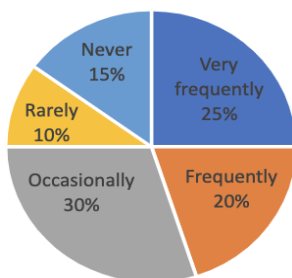
Age Distribution: The survey included 30 respondents aged 14 to 30 years and 20 respondents aged 31 to 60 years, representing young and older women in rural India.

Digital Device Usage: 25% of respondents reported using digital devices very frequently, while 15% never used them, indicating varying levels of digital access.

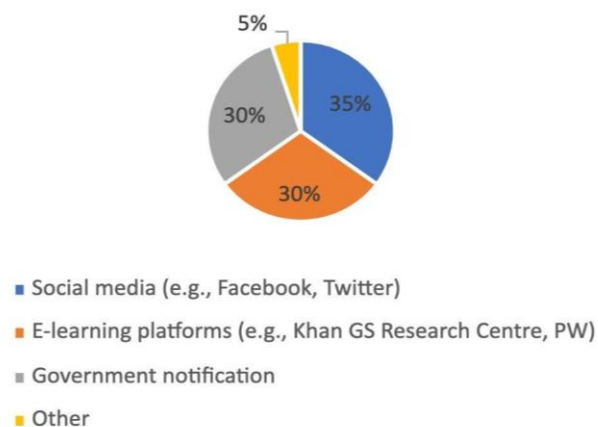
Online Platforms: 35% of respondents used social media and 30% of respondents utilised e-learning platforms for accessing information and learning resources.

Impact of Digital Skills: 30% of respondents stated that digital skills helped them find new job opportunities or enhance their current prospects.

Frequency of digital device usage



Platforms used for information access and e learning



2.2 Qualitative Findings

Empowerment through Digital Access: Women highlighted that digital access empowered them by providing opportunities for online education, market information, e-commerce, and digital marketing.

Age-related Challenges: Younger women found it easier to adapt to technology, while older women faced some difficulties in learning new digital skills.

Financial Constraints: Women from Below Poverty Line (BPL) families faced challenges in accessing digital technologies and paid skill development courses due to financial constraints.

Caste-based Barriers: Women from Scheduled Caste (SC) and Scheduled Tribe (ST) communities reported low awareness and limited access to educational and skill development opportunities.

3. International Best Practices

Women and girls continue to face significant inequalities particularly in rural areas where access to phones and computers is limited. Furthermore, illiteracy poses a formidable barrier for women to participate in the digital sphere, with two-thirds of the 700 million illiterate adults globally being women. While the number of digital initiatives has grown in recent years, reaching rural areas still remains a significant challenge.⁶

In the year 2020, the global literacy rate for men over the age of 15 stood at an impressive 90%, whereas the corresponding figure for women was slightly lower at 87%. The gender disparity was even more pronounced in Sub-Saharan Africa, where only 72% of males were literate compared to a mere 59% of females.⁷

Studies show that literacy level plays a significant role in creating access to technological platforms including mobile, internet usage, etc. While women and girls face significant disadvantages in education and entrepreneurship, digital technologies can offer opportunities to bridge these gaps and empower them. However, comprehensive efforts are necessary to address these challenges and ensure that the benefits of digital inclusion are accessible to all, irrespective of gender or social status. It is essential to acknowledge that the benefits of digital technologies are not evenly distributed, and there are still barriers to overcome.

After conducting a secondary review of multiple technology initiatives targeting rural women worldwide, we have identified several exceptional practices that stood out. Here are a few noteworthy international best practices, implemented by multiple stakeholders along with their corresponding implementation methods which provide valuable insights and may be suitable for implementation in India.

3.1 Mexico and Latin American Countries

App Morada is a mobile application dedicated to providing essential resources to prevent violence against women and supporting those who have experienced violence, especially with a focus on women with disabilities.⁸ The App was developed, based on a comprehensive study by the Centre for Rights, Childhood, and Parenting (CIDIP), a Mexican civil society association founded by a group of dedicated female human rights activists. App Morada offers women effective information and tools like identification of violence against women, emergency number to call for help, connections with shelter homes, and so on to navigate and overcome violent situations. As per data shared by the World Bank in 2022, Mexico has about 19% of

⁶ Rural Women and Technology, <https://www.dianova.org/news/rural-women-and-technology/>

⁷ This is how much the global literacy rate grew over 200 years <https://www.weforum.org/agenda/2022/09/reading-writing-global-literacy-rate-changed/>

⁸ Mathilde Sengoelge and Paul Tchounwou, The Usage of Mobile Apps to Fight Violence against Women: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8297081/>

its population in rural areas and the majority of the population resides in urban centres and the app is accessible across the country on mobile phones.⁹

ProMujer is a non-profit development organisation that empowers women in Latin American countries in partnership with Microsoft and plays a crucial role in promoting ICT and STEM training in the private sector.¹⁰ ProMujer collaborates with corporate and financial sector stakeholders, multilateral organisations, and governments to raise awareness and enhance their capabilities in creating gender-equitable interventions or products within their respective operations. Microsoft helps in the training of women in coding and building websites to promote their small businesses. In countries like Argentina, Bolivia, Mexico, and Nicaragua, ProMujer is working on the health and well-being, financial inclusion, skill, and entrepreneurship development of women. The financial services are provided on a digital platform for women entrepreneurs, employees, and small business owners who are seeking economic independence. It is done through a mobile wallet on ProMujer's credit platform, a contact centre that provides personalised support using chatbots and telephone calls. ProMujer provides over two million women in Latin American countries opportunities to develop personal and business skills by building their skills through workshops, educational resources, mentoring, and connecting them with other women with entrepreneurial skills using technology.

3.2 Bangladesh

Skills and Training Enhancement Project (STEP) was launched in Bangladesh in 2010 with the intent to strengthen both public and private training institutions, with the primary goal of enhancing the quality of skills training and increasing the employability of trainees, both locally and internationally.¹¹ This initiative is designed to benefit individuals from disadvantaged socio-economic backgrounds while improving the quality of the training provided by various institutions. Since the approval of the project, it has provided stipends to 69,000 diploma students enrolled in 93 polytechnic institutions. Additionally, 29,700 trainees have received training through various training providers, including 25% of women.

In addition to its objectives, STEP worked on piloting Technical and Vocational Education and Training schemes, particularly at the secondary school certificate level. This effort aimed at establishing stronger connections between schools, communities, and various training providers. The project also introduced an apprenticeship programme to familiarise students with vocational education and training at an early stage. As part of its curriculum enhancement, the project emphasised the development of technical skills to equip students for future career opportunities.

3.3 Ghana and other African Nations

With the support of the German Development Ministry, efforts have been initiated in 15 African countries to equip young people with the necessary skills for digital transformation.¹² The private sector has successfully supported holding workshops and events to promote digital skills, especially for young women and girls. The voluntary trainers in 20 countries reached 13, 800 young women and girls who learned the first steps of programming like phone applications and how to use programming languages like HTML, CSS, Javascript, and JAVA.

Ghana's ambitious national digitization programme with connectivity for the underserved rural communities includes 'Girls Can Code' which has trained 300 girls from 10 junior high schools in coding

⁹ World Bank, Rural population (% of total population) | Data, <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS>

¹⁰ Pro Mujer, <https://promujer.org/b2b/en/>

¹¹ Bangladesh: Skills and Training Enhancement Project, <https://www.worldbank.org/en/results/2014/04/11/bangladesh-skills-and-training-enhancement-project>

¹² Federal Ministry for Economic Cooperation and Development, <https://www.bmz.de/en>

and ICT.¹³ They also take part in a major initiative called Africa Code Week, a highly successful annual event in 35 African countries. Africa Code Week sponsors hundreds of coding workshops all over the African continent. Africa Code Week provided training in digital skills to more than 538,000 girls during focused workshops in a year.

3.4 Global Concerns for Women around the Use of Technology

Technology creates opportunities for increasing women's participation in the workforce, it helps them access resources and provides them with opportunities of financial autonomy. Online-based gender-related violence has emerged through the growth of ICT technologies and devices such as the phone, Internet, and email as well as social media platforms. The latter appears as an especially fertile ground for online violence.¹⁴ Evidence shows that numerous types of abuse can occur on and through ICT and social network sites. The phenomenon of cyberviolence includes but is not limited to, cyberstalking, cyberbullying, online harassment, misogynist speech, cyber dating abuse, and revenge porn and sexual trafficking. However, some of the concerns which need to be mitigated to help women use the platform effectively include issues of privacy and cyberbullying. Overuse of the various platforms can also lead to issues related to mental and physical well-being like lack of sleep, ADHD, decreased communication and socialisation. Women should be informed about such side effects and mitigation mechanisms like support groups should be developed as part of the training they receive.¹⁵ To address global concerns for women using technology, it's crucial to implement digital literacy programs, awareness campaigns, and stronger platform policies against online gender-related violence. Legal frameworks, support services, and inclusive design practices are essential, along with collaborative efforts among governments, NGOs, tech companies, and communities to create a safer and more empowering digital environment for women.

4. Technologies for social empowerment

Technology has become a powerful tool for promoting women's empowerment in recent years, particularly in rural areas. A multitude of technologies, ranging from audio-based solutions to fintech platforms, have been leveraged in an attempt to close the gender divide and increase economic, social and educational opportunities for women in rural areas. The following analysis will explore four main areas of technology, among the many others that have been used- in the field of women's empowerment.

4.1 Audio-based technology

Since the literacy rate of women in rural areas is extremely low, with over 200 million across India being illiterate¹⁶ voice messages in applications such as WhatsApp¹⁷ have been used to establish communication networks between government organisations, NGOs, and women in rural areas¹⁸. Community radio stations, podcasts, interactive voice response (IVR) systems, and audio-based educational programs have also been instrumental in disseminating information on health, agriculture, financial literacy, and other

¹³ Rural Women and Technology, <https://www.dianova.org/news/rural-women-and-technology/>

¹⁴ Online and ICT-facilitated violence against women and girls during COVID-19, <https://www.unwomen.org/en/digital-library/publications/2020/04/brief-online-and-ict-facilitated-violence-against-women-and-girls-during-covid-19>

¹⁵ OECD, Bridging the Gender Divide, <https://www.oecd.org/digital/bridging-the-digital-gender-divide.pdf>

¹⁶ In India, Smartphones and Cheap Data Are Giving Women a Voice, <https://www.wired.com/story/india-smartphones-cheap-data-giving-women-voice/>

¹⁷ How women in villages are using technology for supporting their families, <https://tech.hindustantimes.com/tech/news/how-women-in-villages-are-using-technology-for-supporting-their-families-71615220852042.html>

¹⁸ How these organisations are using WhatsApp Communities to drive social change, <https://indianexpress.com/article/technology/tech-news-technology/how-these-organisations-are-using-whatsapp-communities-to-drive-social-change-8301954/>

relevant topics. India has 22 officially recognised languages, and over 1,600 local dialects are spoken in an area of 3.2 million kilometres. Given the country's vast geographical diversity and also diverse tribal and minority cultures, it was challenging for governments and philanthropic organisations to ensure communication with everyone, even in the remotest regions. During these times, community radio stations became the first choice for the government, civil society organisations and humanitarian organisations to disseminate relevant and updated information regarding the lockdown, health measures, etc., as well as busting the myths around the virus.¹⁹

4.2 Visual-based technologies

Visual applications and websites have also been a significant development in the field of women's empowerment. Youtube and similar media have been used profusely since COVID as educational platforms. Paromita Sen from SEWA Bharat²⁰ referred to a video that her organisation created, instructing rural women on how to sew masks from simple household items. This video was then shared through messaging apps and resulted in a large number of women who were able to generate income during COVID by creating masks. She also reported, in coherence with our survey, about the use of video-on-demand with the option to download content in the local language as something with large potential. Our survey reported that 30% of respondents stated that digital skills helped them find new job opportunities or enhance their current prospects, a large amount of this occurred through access to videos. Video calling apps have also been useful, with some sources reporting that they conduct 70-80% of their business through WhatsApp video calling.²¹

4.3 Social Media, Messaging and Translation

Perhaps the most significant technological advancement which has been empowering women has been messaging and networking apps such as WhatsApp and Facebook which allow NGOs to collaborate with women in rural areas seamlessly. WhatsApp has also been key for rural women to establish their businesses, as they are used to contact consumers across India and send them photos of products. Additionally, survey apps such as KOBO have been used to conduct surveys due to their integrated translation features which allow women in rural areas to receive the surveys in their native language and results to be collected in English. This, in coherence with other translator apps such as google translate, has caused large developments in research and social work to help empowerment of women, as they bridge the gap between social workers and rural women through technology. Messaging and networking apps have also been key as they allow women to talk to each other within these rural areas. Indeed, our surveys found that social media (35%) was the most utilised source of technology for accessing information and learning resources.

4.4 Fintech platforms

Fintech platforms have revolutionised access to financial services in rural areas, empowering women to manage their finances, access credit, and engage in entrepreneurial ventures. However, a lot of these e-commerce platforms have struggled to take off. Amazon's "Saheli" program, which intended to create a marketplace for rural women to sell their products did have a large impact on women in rural areas, and

¹⁹ Sarbani Banerjee Belur Saisudha Sugavanam Ritu Srivastava, Community radio enabling women's empowerment in remote communities of India, Pg 7 https://www.apc.org/sites/default/files/final_community_radio_report.pdf

²⁰ Paromita Sen has spent over 10 years doing research on women leaders, women who protest, and women workers who are driving our economy and our economy

²¹ How women in villages are using technology for supporting their families <https://tech.hindustantimes.com/tech/news/how-women-in-villages-are-using-technology-for-supporting-their-families-71615220852042.html>

similar attempts by other organisations have also seemed fruitful. Amazon India launched the Amazon Saheli programme in 2017 to enable women entrepreneurs²². Still, sources such as Paromita Sen have found these programs unsuccessful, this can be attributed to a lack of developer involvement and interest. Ultimately, it seems that the technologies that perform the best in this field have done so due to extreme interest by developers who are willing to cater specifically to the needs of the parties they are helping.

4.5 Assessing its potential and risks

Is leveraging technology for women in rural areas even justified bearing in mind all the potential risks and challenges?

The adoption and access to technology can vary based on factors such as regional infrastructure, education levels, and cultural norms. While these technologies have shown promise in empowering rural women, challenges remain, including the digital gender divide and limited digital literacy. The most pressing issue seems to be the lack of internet towers in rural areas in combination with a lack of devices given to women in rural areas, our surveys show that only 25% of women reported using digital devices frequently with 15% having never used them. Technology gives women a relatively affordable means to establish and keep connections with friends, family, clients and suppliers. In addition to facilitating communication, information and knowledge resources that can effectively address the requirements of women specifically, such as maternity care, child care, education, and agriculture, are made available through technology.²³ A user-centred technology solution called "Krishi-Mitra"²⁴ supports the development of capacity among the low-literate and illiterate rural farming populations in India, having been created using audio-visual-textual cues and examples that are known to local people for simple communication. Since technology enables the delivery of information and services regardless of time and distance, it is an efficient provider of essential public services such as education, healthcare and financial services online to a wider range of people including those who used to be excluded or were unable to access such services. Different government-related services can be completed using technology with greater convenience and efficiency, making the lives of women easier and allowing them to focus this time and energy on other crucial daily activities. In addition to all these, technology, irrespective of users' socio-economic backgrounds, is helping flatten traditional social hierarchies and providing a platform for women to be connected and raise their voices against various social issues.

However, there come various challenges as well. While technology has helped in empowering women socially and economically, different technologies have also brought to light numerous threats. Violence against women online is on the rise. In developed and developing countries alike, women have fallen victim to frequent blackmails, revenge porn, stalking, and other activities that harm these poor women mentally and physically. The issue has become worse manifold times due to Privacy violations in social networking sites like Facebook, Instagram and WhatsApp.²⁵ Online violence and crimes against women have put women's personal safety at risk and hindered the process of gaining women's empowerment using technology-enabled options. Poor enforcement of technology policies and cyber laws and weak tracing and punishment of offenders has made the online space unsafe for urban and rural women users alike, resulting in continued crime. In some cases, existing laws were found to be ineffective in prosecuting the

²²What is Amazon Saheli? <https://sell.amazon.in/grow-your-business/amazon-saheli>

²³ UN APCICT, Women's Empowerment, SDGs and ICT, https://www.unapcict.org/sites/default/files/inline-files/Module_C1.pdf

²⁴ Rajasee Rege, Shubhada Nagarkar, Krishi-Mitra: Case Study of a User-centric ICT Solution for Semi-literate and Illiterate Farmers in India, <https://www.scienceopen.com/hosted-document?doi=10.14236/ewic/IHCI2010.9>

²⁵ Aashank Dwivedi, Crime Against women through Social Media, <https://timesofindia.indiatimes.com/readersblog/aashank-dwivedi/crime-against-women-through-social-media-48132/>

criminals behind revenge porn, online blackmailing and other related crimes, even in developed countries. Such huge implications when placed upon a relatively lesser literate rural women population, put them under extremely high danger. This could end up becoming catastrophic for not just direct technology-using women but by extension even their families and dependents.

So now, coming to the primary question-yes, it definitely is. Although with additional comprehensive features to make it more inclusive and safe for rural women. The benefits of using technology far outweigh the possibilities of crime and other negative effects. Technology, and more specifically messaging, fintech and upskilling technology has the scope to completely redefine the way women from rural areas go about their daily lives. If anything, with the digital revolution since the last decade, it becomes increasingly important for rural women to keep themselves up to market skill levels to ensure employability and market wage access. And this is the right time as well, any further ado and the rural skill ecosystem could take a massive hit which could take years to bounce back from.

5. Policies and Schemes in India and Gaps

The present state of skill development in India is notably inadequate. As per the Human Development Report released by the UNDP in 2020²⁶, a mere 20% of the workforce possesses adequate skills. This underscores the urgent requirement to enhance the scale and scope of skill development initiatives in India. The significance of skilling is multifaceted, primarily due to the prevailing deficiency in upskilling and re-skilling, resulting in a considerable disparity between the competencies of employees and the dynamic demands of the labour market. In the current highly competitive job landscape, foundational skills have become imperative even for entry-level positions. This evolving market requires constant upskilling and reskilling at different stages of careers for different demographics. Another noteworthy fact is that the percentage of the workforce receiving skill training is only 13.9% in India (PLFS 2019-20)²⁷ which is very low compared to other countries such as Germany, Japan and South Korea, which surpass 75%. This sheds light on the substantial disparity between India's current standing and international benchmarks within the global job market.

Throughout Indian history, government schemes have played a pivotal role in touching the lives of rural Indians. To better understand the direction in which India is moving with regard to skilling and digital literacy for rural Indian women, it is crucial to bring to light various Central Government schemes regarding the same. Broadly, there have been five important schemes that we will study in detail- PMGDISHA, Digital Shakti Campaign, TDUPW, Skill India Mission and National Digital Literacy Mission.

5.1 Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA)

With an estimated budget of Rs 2,351 crores,²⁸ the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) is one of the largest digital literacy programs in the world. The scheme is intended to digitally literate six crore rural Indian households. The programme has been designed in such a way as to teach rural households how to operate digital devices-tablet, smartphones and computers, browse the internet, use email, access online citizen-centric services and carry out digital payments. The PMGDISHA

²⁶ UNDP, <https://hdr.undp.org/content/human-development-report-2020>

²⁷ Ministry of Statistics and Programme Implementation, Periodic Labour Force Survey, https://mospi.gov.in/sites/default/files/publication_reports/Annual_Report_PLFS_2019_20F1.pdf

²⁸ PIB, Cabinet approves 'Pradhan Mantri Gramin Digital Saksharta Abhiyan' for covering 6 crore rural households.

Scheme covers candidates in the age group of 14-60 years.²⁹ As of the latest available figures of 02/08/2021, approximately 5.01 crore beneficiaries have been enrolled and 4.21 crore have been trained under the PMGDISHA Scheme. Out of this 5.01 crore, 2.59 crore women beneficiaries are registered, which amounts to nearly 52% of the cumulative registration count.³⁰

But, the PMGDISHA scheme is not devoid of problems. The 20 hour training sessions have been known to have witnessed defaulting on the part of the instructors, who have also been found to be indulging in bribery practices.³¹ Moreover, each centre has only three computers on average, resulting in a lack of individual training. Trainers face countless issues too, with an overwhelming set of formalities such that they rarely get time to focus on their classes.

5.2 Digital Shakti Campaign

A pan-Indian initiative called Digital Shakti³² launched by The National Commission for Women (NCW) and the CyberPeace Foundation seeks to digitally educate and empower women and girls. The program was launched in June 2018 with the goal of assisting women across the country in increasing their level of digital literacy, fostering resilience, and effectively combating cybercrime.³³ Through this effort, more than 3 lakh³⁴ women in India have learned about cyber safety tips and methods. The project has been accelerating the digital participation of women and girls by training them to use technology to their advantage and to keep themselves safe online. The project aims to contribute towards the larger goal of fighting cyber violence against women and girls and making the internet a safer space for them.

The campaign strived to educate more than one million women about cyber safety. But the pace has been considerably slow. Scalability is a huge concern with regard to the implementation of this programme. Despite its introduction five years back, the programme has not adequately tapped into more rural areas and is far off hitting its desired one million mark. The benefits of this programme are tremendous on paper, but to really leave an impact on society, it is imperative that the campaign is extended to include a larger base of women.

5.3 Technology Development and Utilisation Programme for Women (TDUPW)

The Technology Development and Utilisation Programme for Women (TDUPW) is a programme in India that seeks to encourage women to use new technologies, raise awareness of technology-related issues, and provide training to women.³⁵ The Department of Scientific and Industrial Research (DSIR) of the Ministry of Science and Technology oversees the program, which offers financial support for projects with a focus on technology. The objectives of the programme as enshrined by the DSIR are, Promoting the adoption of new technologies by women, awareness creation and training of women on technology-related issues, promoting technological upgradation of enterprises run by women entrepreneurs, showcasing of appropriate technologies and organising demonstration programmes for the benefit of women and, design and development of products and processes beneficial to women.³⁶

²⁹ PMDISHA, homepage <https://www.pmgdisha.in>

³⁰ PIB, Digital Literacy Among Women

³¹ The Wire, The truth behind the growing number of India's digital illiterate, <https://thewire.in/economy/pradhan-mantri-gramin-digital-saksharta-abhiyan-truth-behind-digital-literacy-in-india>

³² PIB, <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1876462>

³³ Digital Shakti, <https://www.digitalshakti.org/about-campaign/>

³⁴ PIB, <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1876462>

³⁵ Department of Scientific and Industrial Research, <https://dsir.gov.in/technology-development-utilization-programme-women-tdupw>

³⁶ Government of India, <https://www.india.gov.in/technology-development-and-utilisation-programme-women-department-scientific-industrial-rese>

The fundamental gap with respect to the TDUPW is that it concentrates on agricultural and medical sciences only.³⁷ This could be greatly broadened to include various other fields such as finance, engineering, law and the like so as to include a larger number of women in different fields in which they could thrive. Only once this is done can the benefits of this scheme be truly maximised. This handicap greatly affects the reach and scale of this scheme. Furthermore, this scheme has not been implemented across a few parts of the country, resulting in reduced access to some womenfolk.

5.4 Skill India Mission

The Skill India Mission, launched by the Government of India in 2015, aims to empower rural women by providing them with relevant skill training and employment opportunities. The chief objective of the Skill India Mission is to provide market-relevant skills training to more than 56 crore young people in the country, specifically training over 28 crore women.³⁸ The focus of the Skill India Mission is on enhancing the employability of the youth so that they secure employment and also encourage entrepreneurship among them. The mission offers training, guidance, and support for all traditional types of employment like weavers, cobblers, carpenters and the like. New domains will also be emphasised such as real estate, transportation, construction, gem industry, textiles, tourism and other sectors where the level of skill is inadequate.³⁹ The Skill India Mission has sub-schemes such as the Pradhan Mantri Kaushal Vikas Yojana and the Deen Dayal Upadhyaya Grameen Kaushalya Yojana that have strived to make significant inroads into the skilling landscape.

Pradhan Mantri Kaushal Vikas Yojana (PMKVY)⁴⁰ aims to enable a large number of Indian youth to take up industry-relevant skill training that will help them in securing a better livelihood. Under this Scheme, Training and Assessment fees are completely paid by the Government. Its main objectives are to enable and mobilise a large number of youths to take up industry designed quality skill training, become employable and earn their livelihood, align skill training with the actual needs of the country, encourage standardisation of the Certification process and put in place the foundation for creating a registry of skills and benefit 10 million youth over the period of four years.

The extraordinary goals of the Skill India Mission are however far from being realised. Post Covid, the scheme struggled to find jobs for its trainees, with only 20% of those who were certified getting placed, against the target of 70%.⁴¹ This shows that this policy and its training sessions were not successful in imparting the level of knowledge and skill that was demanded by the various industries. Additionally, there exists a huge gap in good quality training infrastructure, a lack of monitoring authority which can maintain the good standard of these training institutes and negligible private investment in the mission. Training of the trainers themselves becomes a very cumbersome process due to the sheer scale of operation. There is a huge gap in terms of the expectations and actual employability of youth undergoing training under PMKVY, with several questions being asked on the quality of training. Technology has been increasingly

³⁷ India Science and Technology, <https://www.indiascienceandtechnology.gov.in/programme-schemes/women-schemes/technology-development-and-utilization-programme-women-tdupw>

³⁸ Ministry of Skill Development and Entrepreneurship, Women get a special focus under Skill India Mission, <https://msde.gov.in/sites/default/files/2019-09/Women%20get%20a%20special%20focus%20under%20Skill%20India%20Mission.pdf>

³⁹ PIB Ministry of Finance, Government committed to equip workforce with employable skills and knowledge in mission mode, <https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1894912#:~:text=The%20Skill%20Indian%20Mission%20focuses,development%20schemes%20across%20the%20country>

⁴⁰ PMKVY, <https://www.pmkvyofficial.org>

⁴¹ India's flagship skills mission struggles with lowly 20% placement rate for trainees, <https://www.moneycontrol.com/news/business/economy/indias-flagship-skills-mission-struggles-with-lowly-20-placement-rate-for-trainees-8266021.html>

prioritised over the last few years with other digital literacy schemes taking the forefront and directly impacting the Skill India Mission. An important point to note is that this programme has reached a reasonable number of women and has trained over 62,29,274 women across the various sub schemes as compared to 1,08,33,636 men that have been trained, as of the latest figures of 2021-22.⁴²

5.5 National Digital Literacy Mission

The National Digital Literacy Mission is an initiative by the Government of India to promote digital literacy among individuals and communities., especially in rural areas.⁴³ The mission aims to create a better socio-economic ecosystem by developing digital literacy skills through a rigid curriculum. It is formulated to provide IT training to 52.5 lakh individuals, including villagers, Anganwadi and ASHA workers including persons involved in food security through ration shops.. It acts as a full-fledged knowledge centre for providing supplementary education and technical literacy.

Though the features and provisions of the National Digital Literacy Mission are exemplary, a severe lack of funds has caused problems. This has resulted in targets not being met and potential not being maximised. There have also been severe staffing issues, with a lack of adequate technical support in some of these rural areas. There have also been concerns raised on the lack of sufficient representation for Scheduled Castes and Scheduled Tribes.⁴⁴

6. Recommendations for the Nudge Foundation

Women's empowerment in rural India is a critical issue that demands innovative approaches. Technology has emerged as a powerful tool to address the challenges faced by rural women, offering solutions to bridge the digital divide and unlock opportunities for economic and social growth. These are the steps that Nudge can take to help rural women through technology.

6.1 Short-Term Recommendations

a) Prioritise Audio-based Solutions for Information Dissemination:

Immediately implement audio-based solutions like voice messages on WhatsApp and interactive voice response systems to disseminate vital information to rural women. This will bridge the communication gap and ensure access to essential knowledge.

b) Collaborate with Messaging and Networking Apps:

Establish partnerships with popular messaging and networking apps like WhatsApp and Facebook to create a supportive network for rural women. Utilise these platforms to share updates and facilitate dialogue between women and support organisations.

⁴² PIB Steps taken by the Government to promote Women participation in Skill Training Programme, <https://pib.gov.in/PressReleasePage.aspx?PRID=1778477>

⁴³ PIB Digital Literacy Mission, <https://pib.gov.in/PressReleasePage.aspx?PRID=1885365>

⁴⁴ Digital India: The IT literacy mission is getting bigger but it faces problems at every level, <https://scroll.in/article/855259/digital-india-the-it-literacy-mission-is-getting-bigger-but-there-are-problems-at-every-level>

c) Provide Comprehensive Digital Literacy Training:

Introduce digital literacy workshops in partnership with government schemes like the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA). These workshops should focus on teaching rural women basic digital skills, enabling them to use devices and access information effectively. d) Utilise Survey Apps with Integrated Translation Features:

Start using survey apps with integrated translation features to collect feedback from women in their native languages. This will enhance data collection and empower women to actively participate in research activities.

d) Foster Local Community Engagement and Leadership:

Involve women workers from rural communities as active participants in research and data collection. This approach will foster a sense of ownership and empowerment, ensuring technology solutions align with the genuine needs of the beneficiaries.

6.2 Long-Term Recommendations

a) Develop Engaging Visual-based Educational Content:

Over time, create educational videos on platforms like YouTube and Instagram Reels to impart skill development and training programs. Invest in video production to promote practical skills and income-generation opportunities for rural women.

b) Facilitate Financial Inclusion with Fintech Solutions:

In the long term, develop or partner with user-friendly fintech platforms to provide access to mobile-based banking, microloans, and digital payment systems. Customization and developer involvement will be crucial for success.

c) Prioritise Cyber Safety and Data Protection:

Ongoing efforts should be made to implement awareness campaigns on cyber safety and data protection. Empower rural women with knowledge and tools to navigate the digital space securely, ensuring their overall safety and well-being.

d) Collaborate with Skill India and PMKVY:

Establish sustained partnerships with Skill India Mission and Pradhan Mantri Kaushal Vikas Yojana (PMKVY) to access skilled trainers and resources for upskilling rural women. Continued collaboration will enhance the impact of Nudge's interventions and promote women's employability and economic independence.

6.3 Risks and Limitations:

a) Digital Divide Persists:

Despite efforts to bridge the digital divide, challenges related to infrastructure limitations and unequal technological access in remote rural areas may persist. Uneven internet connectivity, lack of electricity, and limited availability of devices can hinder the effective implementation of technology-based interventions. This can further marginalise women who are already disadvantaged by their geographical location.

b) Social Norms:

While tailoring solutions to local contexts is essential, deeply ingrained cultural norms and practices can pose challenges to technology adoption. Traditional gender roles, restricted mobility, and social norms might discourage women from actively engaging with technology. Overcoming these cultural barriers requires sensitive strategies that address cultural sensitivities and promote the value of technology in women's lives.

c) Sustainability Challenges:

Long-term success hinges on sustained funding, technical support, and consistent community engagement. Without continued financial resources, initiatives may falter, leaving women without access to vital services. Technical support is also crucial to address technical glitches and provide assistance when needed. Moreover, maintaining active community engagement is essential to ensure that the technology remains relevant to women's evolving needs.

d) Dependency on Technology:

While technology empowers, there is a risk of creating dependency among rural women who may not possess advanced digital literacy skills. Over-reliance on technology can inadvertently disempower women who lack proficiency in using digital devices. Therefore, any technology-based intervention should be accompanied by relevant digital literacy training to ensure that women are equipped to use technology effectively, fostering a balance between empowerment and dependency.

e) Data Privacy Concerns:

As technology involves collecting and storing data, ensuring data privacy is paramount. Women in rural areas might be hesitant to participate in technology-driven interventions due to concerns about the misuse of their personal information. Establishing robust data protection measures and transparent communication about data usage will be critical to building trust and encouraging women's participation.

Addressing these potential challenges and risks requires a comprehensive approach that encompasses awareness, education, and continuous adaptation. Careful planning and strategic partnerships are needed to overcome the digital divide and cultural barriers. Implementing strong data protection measures and ensuring sustainable funding is vital for long-term success. Finally, a holistic approach that combines technology with digital literacy training will empower women while mitigating the risk of dependency. Nudge's efforts in leveraging technology for women's empowerment in rural India must navigate these challenges with resilience and adaptability to maximise the positive impact on women's lives.

7. Conclusion

In conclusion, there are many obstacles to overcome in the effort to use technology to empower women in rural India. The most notable of these is the "digital divide," which is characterised by rural areas' lack of access to dependable internet connectivity and contemporary technology, impeding women's ability to benefit from digital interventions. A significant barrier to rural women's use of technology is their low digital literacy, which calls for specialised approaches. Cultural and linguistic barriers exacerbate the problem and necessitate context-specific solutions. Financial limitations make it difficult for some rural women to acquire technology due to the high costs of smartphones and internet connectivity. Particularly, the protection of women's information becomes essential to maintaining their rights and encouraging trust in technology-driven efforts. As a result, data privacy and security emerge as top concerns. For technology to have the greatest possible influence on the empowerment of rural women, these restrictions must be addressed. The Nudge Foundation can have a big impact on women's empowerment in rural India by putting the supplied short- and long-term recommendations into action. Immediate initiatives can close the digital divide and address urgent needs, while long-term plans can create viable options for promoting growth and development in rural areas. The Nudge Foundation may have a significant, long-lasting, and beneficial impact on women's empowerment in rural India through creative digital initiatives, strong community participation, and a dedication to addressing women's needs.

Annexure A: Survey Questionnaire

In this section, we present the questions asked to the three key stakeholder groups: rural women, Gram Sarpanch, and government program implementers from the Kushal Yuva Program (KYP). The responses provided by the stakeholders offer valuable insights into the digital gender divide in rural Bihar and the impact of skill development programs on women's empowerment.

Total Respondents: 50 (30 girls aged 14 to 30 years, 20 women aged 31 to 60 years)

Survey Questions for Rural Women:

1. What is your age?
 - 14 to 30 years
 - 31 to 60 years
2. What is your gender?
 - Female
3. Please specify your family's financial background:
 - Below Poverty Line (BPL)
 - Above Poverty Line (APL)
4. Please specify your caste category:
 - General
 - Other Backward Classes (OBC)
 - Scheduled Caste (SC)
 - Scheduled Tribe (ST)
5. How often do you use digital devices (e.g., smartphones, computers) in your daily life?
 - Very frequently
 - Frequently
 - Occasionally
 - Rarely
 - Never
6. Which online platforms do you use the most for accessing information and learning resources?
 - Social media (e.g., Facebook, Twitter)
 - E-learning platforms (e.g., Khan GS Research Centre, PW)
 - Government notification
 - Other (please specify): _____
7. Have digital skills and literacy helped you in finding new job opportunities or enhancing your current job prospects?
 - Yes
 - No

Introduction: This questionnaire aims to gather insights into the mobile phone usage patterns and digital access among illiterate women from rural families. The interviewees belong to four different families, each representing a distinct caste - General, Other Backward Classes (OBC), Scheduled Caste (SC), and Scheduled Tribe (ST). All participants are illiterate, studied up to 8th grade, aged between 30 to 60, and come from families living below the poverty line.

Illiterate-to women up to 8 grade education

- Do you have a mobile phone? If yes, please specify whether it's a keypad phone or smartphone.

- Is the mobile phone personal to you, or is it shared/common within the family?
- How often do you use the mobile phone?
- What are the main reasons for using your mobile phone? (e.g., staying connected with family, accessing information, entertainment)
- How do you use your mobile phone on a typical day? (Calls, messages, social media, etc.)
- Which social media platforms do you actively use or follow? (Select all that apply)
- How frequently do you access social media or other digital platforms on your mobile phone?
- Whom do you follow, watch, or listen to on social media or digital platforms? (e.g., influencers, leaders, entertainers, etc.)
- What topics or content do you enjoy the most from the people you follow or engage with?
- Do you use your mobile phone to access any government programs or services? If yes, please specify.

Survey Questions for Gram Sarpanch:

1. How do you perceive the current state of digital access and literacy among women in your rural community?
2. Are there any specific initiatives or programs in place to promote digital literacy and skill development for women in your village?
3. In your opinion, what role can Gram Panchayats play in bridging the digital gender divide and empowering women through digital access?

Survey Questions for Government Program Implementers:

1. How has the Digital skill program impacted women's skill development and digital empowerment?
2. What are the main challenges faced in implementing skill development programs for rural women?
3. How do you measure the success and impact of skill development initiatives on rural women's empowerment?
4. What are your future plans to enhance the effectiveness of skill development programs for rural women?
5. How can digital technologies be leveraged to further promote women's empowerment in rural India?

Annexure B: Interview Insights

The following table summarises the mobile phone usage and digital access patterns among illiterate rural women of different castes:

Question	General	OBC	SC	ST
1. Mobile Phone	Yes (Smartphone)	Yes (Keypad)	Yes (Smartphone)	Yes (Keypad)
2. Ownership	Common	Common	Personal	Personal
3.Usage Frequency	5-6 times a day	2-3 times a day	7-8 times a day	5-6 times a day
4. Main Purpose	Staying connected with family	Staying connected with family	Staying connected	Staying connected
5. Calls	Calls (Video Calls)	Calls	Calls	Calls
6. Digital Activities	YouTube with the help of children	YouTube & Facebook on children's phone	YouTube & Facebook	YouTube & Facebook on children's phone
7. Usage Frequency	Sometimes when I am free	Sometimes	Frequently	Sometimes

8. Influences	Bageshwar dhamsarkar (Dhirendra Shastri), Anirudhacharja and other spiritual leaders	Bhojpuri actors	Bhojpuri actors	Bhojpuri actors & comedians
9. Preferred Content	Dharmik & news	Bhojpuri entertainment	Bhojpuri entertainment	Bhojpuri entertainment & local news
10. Government Use	No, all of these official work is done by husband	No, all government work is done by husband or children	Yes, getting information about pensions	No, all work done by husband

This table provides a clear and concise overview of the responses from rural women of different castes regarding their mobile phone usage and digital access patterns.