Digital Empowerment for Gender Equality in SDGs

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Abstract

This study examines how digital tools can bridge gaps in gender equality and spark innovation, in line with Sustainable Development Goals (SDGs) 5 (Gender Equality) and 9 (Industry, Innovation, and Infrastructure). It explores the digital gender divide, where unequal access to technology, limited STEM opportunities, and cultural norms hinder women's participation in the digital economy. Through a qualitative lens, I analyze case studies and initiatives like India's Digital Saksharta Abhiyan and Google's Internet Saathi, drawing insights from policy reports, academic works, and social media campaigns like #WomenInTech. Findings reveal that digital literacy and platforms like Etsy help rural women gain financial independence and build sustainable businesses with minimal environmental impact, supporting circular economy principles by reducing the need for physical infrastructure. For instance, Indian artisans on Etsy report 40% income increases, showcasing economic resilience. Yet, barriers like poor internet access—only 24% of rural South Asian women are online (GSMA, 2022)—and societal biases remain, disproportionately affecting marginalized communities. I propose expanding affordable digital access, encouraging women in STEM through programs like UNESCO's SAGA, and fostering public-private partnerships to tackle these issues. This work highlights technology's potential to create fairer, greener societies, advancing sustainable development through inclusive, women-led innovation.

Keywords:

Digital Empowerment, Gender Equality, Digital Gender Divide, STEM Education, Public-Private Partnerships, Sustainable Development Goals, Digital Literacy

Reference to this paper should be made as follows:

Received: 26.04.25
Approved: 07.05.25

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Vol. XVI,
Special Issue No.1
Article No.26
pp. -161-165
Similarity Check: 2%

Online available at
https://anubooks.com/journal/journal-global-values

DOI: *https://doi.org/10.31995/jgv.2025.v16iSI.026*

1. Introduction

As a Scholar studying colonial Bengal, I've often reflected on how systemic barriers have long limited women's roles in society, much like they do today in the digital age. In the 19th century, women in Bengal were confined by patriarchal norms, and denied education and economic agency—a pattern that echoes in modern rural India, where access to technology remains a privilege. Digital tools, however, are starting to shift this narrative, offering pathways to address gender inequality and support sustainable development. The United Nations' Sustainable Development Goals (SDGs), particularly SDG 5 (Gender Equality) and SDG 9 (Industry, Innovation, and Infrastructure), call for inclusive progress, and I believe technology can play a pivotal role here.

Gender inequality continues to restrict women's access to education and entrepreneurial opportunities, especially in rural areas where societal norms dictate their roles. Online platforms like Etsy and Shopify are quietly revolutionizing this space, allowing women to start businesses with minimal setup—think of it as a digital version of the circular economy, reducing physical waste while empowering women economically.

Yet, the digital gender divide looms large. In developing nations, women are 17% less likely to use the Internet than men, often due to cost or cultural restrictions (International Telecommunication Union, 2022). With fewer women in STEM fields, their ability to engage with technology lags further. This article explores how digital tools can help achieve SDGs 5 and 9, offering ideas to ensure inclusion for women in marginalized communities.

1.1 Objectives

1. Understand how digital tools can foster gender equality (SDG 5) and innovation (SDG 9).
2. Examine the role of digital literacy in supporting women's entrepreneurship.
3. Suggest practical policies to ensure digital inclusion, especially for women in underserved areas.

2. Theoretical Framework

My research builds on ideas of digital empowerment and gender equity, tying them to SDGs 5 and 9. Digital empowerment isn't just about handing someone a smartphone—it's about giving them the skills and confidence to use it in ways that change their lives.

2.1 Gender Equality (SDG 5)

Digital tools open doors to education and healthcare, things many women in remote areas could only dream of before (World Bank, 2022). I've seen how digital literacy lets women speak up—think of movements like #MeToo, where social media became a platform for change (World Economic Forum, 2022). This fits perfectly with SDG 5's goal of leveling the playing field.

2.2 Industry, Innovation, and Infrastructure (SDG 9)

Platforms like Etsy let women entrepreneurs sell handmade goods worldwide, cutting down the need for physical stores and supporting a greener economy (OECD, 2020). When women create apps to solve local problems, like better healthcare access, they're not just innovating—they're building resilience, which is what SDG 9 is all about.

3. Methodology

This study takes a qualitative approach, blending different methods to get a fuller picture.

3.1 Research Approach

I focused on case studies and digital inclusion programs, digging into stories from social media campaigns like #WomenInTech and YouTube videos by women entrepreneurs. Using thematic coding, I looked for patterns in how women access technology, learn digital skills, and turn opportunities

into action. I made sure to handle data ethically, keeping user identities private when analyzing online content.

3.2 Data Sources

- **Primary Data**: Posts and videos from platforms like YouTube, alongside blogs by UN Women and the International Telecommunication Union (ITU).
- **Secondary Data**: Reports like GSMA's 2022 Mobile Gender Gap Report, academic journals, and updates from initiatives like Digital Saksharta Abhiyan (2022).

3.3 Analytical Framework

I mapped the data to my objectives, zeroing in on access challenges, the impact of digital skills, and how innovation plays out for women in these contexts.

4. Findings and Discussion

Digital tools are opening doors for women in ways I hadn't imagined possible a decade ago, but there's still a long way to go before everyone gets a fair shot.

4.1 Digital Literacy

Learning to use a smartphone or a laptop isn't just a skill—it's a lifeline for many women. India's Digital Saksharta Abhiyan (National Digital Literacy Mission) has taught over 5 million rural women how to use e-governance and online markets, giving them a sense of control over their finances (Ministry of Electronics & Information Technology, 2022). I've heard stories from Uttar Pradesh where women, once reliant on others, now apply for government schemes themselves, feeling a new sense of pride. Google's Internet Saathi program builds on this, showing women how to turn smartphones into business tools—60% of them say their income jumped by 30–50% in just a year (Google, 2022). These efforts tie directly to SDG 5, giving women not just skills but a voice in their communities.

4.2 Entrepreneurship

Digital platforms are rewriting the rules for women entrepreneurs, aligning with sustainable practices by reducing the need for physical resources. With sites like Etsy and Shopify, women can sell their crafts—think handwoven sarees or jewelry—straight to buyers in places like London or New York, without ever leaving their village. This minimizes environmental impact by cutting down on physical storefronts, supporting circular economy principles. In India, some artisans have seen their income rise by 40% this way (OECD, 2020). Platforms like Kickstarter let them raise funds for new ideas, breaking the old barriers of needing a loan from a skeptical bank. I find it inspiring that women are also creating apps to solve real problems, like improving healthcare in rural areas, which fits SDG 9's push for innovation that includes everyone. These apps aren't just business ventures—they're lifelines for communities, showing how women can lead sustainable change.

4.3 Barriers

But the road isn't easy. The digital gender divide hits hard in places like South Asia, where only 24% of rural women can get online, compared to 40% of men (GSMA, 2022). It's often just too expensive, or there's no network to begin with. Then there are cultural norms—in some South Asian families, a woman using a smartphone is seen as stepping out of line, so they're kept away from tech altogether. And in STEM fields, women make up just 28% of professionals worldwide because of biases in schools and workplaces (UNESCO, 2022). These hurdles hit the poorest women hardest, making it clear we need solutions that really understand their realities.

4.4 Interventions

There are programs showing us what works. SheTrades, run by the International Trade Centre, helps women entrepreneurs break into global markets, boosting their export success by 30%

(International Trade Centre, 2022). UN Women's projects with private partners have brought tech access to 10,000 women across 20 countries, focusing on education and leadership (UN Women, 2022). GSMA's initiative works with telecom companies to make mobile internet cheaper, reaching 15 million women in tough spots (GSMA, 2022). And Digital Saksharta Abhiyan keeps offering free training—70% of women say it's helped them earn more through online markets (Ministry of Electronics & Information Technology, 2022). These efforts show how working together can make a real difference for SDGs 5 and 9.

5. Case Studies

5.1 Rural India

In Maharashtra, programs like Digital Saksharta Abhiyan and Google's Internet Saathi have taught women to use smartphones for small businesses. Rekha Jadhav, a local woman, now sells jewelry online, becoming a role model for others (Ministry of Electronics & Information Technology, 2022; UNESCO, 2022).

5.2 Sub-Saharan Africa

In Nigeria, Temie Giwa-Tubosun's LifeBank uses tech to connect blood donors to hospitals, saving lives (World Bank, 2022). In Kenya, Judith Owigar's AkiraChix teaches coding to women, helping many land tech jobs (UNESCO, 2022).

6. Policy Recommendations

We need thoughtful steps to make sure technology doesn't leave women behind, especially in places where they're already starting from a disadvantage.

6.1 Infrastructure

Governments should focus on getting affordable internet to rural areas. India's Digital India Initiative has reached 1.2 billion people, but rural women still struggle with access (Ministry of Electronics & Information Technology, 2022). In Bangladesh, phone and data subsidies raised women's connectivity by 20%—we could do the same elsewhere (GSMA, 2022). Setting up Wi-Fi hotspots in village schools and offering free educational apps could make a big difference, tying into SDG 9's vision of fair infrastructure.

6.2 STEM Education

Getting more women into STEM starts with opportunity. UNESCO's SAGA program has boosted female STEM enrollment by 15% with scholarships and mentors (UNESCO, 2022). In Kenya, AkiraChix's coding classes have helped women break into tech. Schools could start STEM clubs for girls, and companies like Microsoft could offer internships, supporting SDGs 5 and 9 by building a more diverse tech future.

6.3 Partnerships

Teamwork between governments and companies can go a long way. UN Women's work with SAP has brought digital skills to 10,000 women (UN Women, 2022). Google's Internet Saathi has trained millions in India (Google, 2022). GSMA's efforts cut mobile costs for 15 million women (GSMA, 2022). Offering tax incentives to companies that join these efforts could help, align with SDGs 5, 9, and 17.

6.4 Cultural Norms

Changing mindsets is tough but necessary. Breakthrough India's Bell Bajao campaign has encouraged tech use among women by 25% through community outreach (Breakthrough India, 2022). We could use local radio or WhatsApp groups to share stories of women succeeding with tech, and schools could teach kids early about gender equality, helping SDG 5 take root.

7. Limitations

This study isn't perfect. I relied on qualitative methods, which means the findings might not apply everywhere since I didn't have big datasets to back them up. Focusing on places like India and Sub-Saharan Africa might miss other regions' challenges. The social media data I used doesn't show long-term effects, and some policy reports might carry their own biases. That's why I think we need to be careful about assuming these ideas will work the same way everywhere.

8. Scope for Future Research

There's more to explore here. We could use surveys or numbers to see how digital tools really affect women's lives across different countries. Looking at new tech like AI or blockchain might open up fresh ideas for inclusion. I'd love to see studies that follow programs like Digital Saksharta Abhiyan over the years to check their lasting impact. We should also look at how things differ between cities and villages, or how age and income play a role, to get a fuller picture of SDGs 5 and 9.

9. Conclusion

Digital tools can change lives—I've seen it in the stories of women finding their footing through programs like Internet Saathi, and building businesses on platforms like Etsy that support sustainable futures by minimizing physical waste. These efforts align with SDG 5 by empowering women and SDG 9 by fostering inclusive innovation, resonating with the book's focus on women-led green economies. But the gaps are real: no internet in remote areas, traditions that hold women back, and too few women in STEM fields. We can address this by building better digital access, getting girls into STEM early, working with companies to scale solutions, and talking openly in communities about why women deserve these opportunities. It's not just the right thing to do—it's how we'll create a fairer, more innovative world for everyone, advancing sustainable development.

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