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TECHNOLOGY-ENABLED EDUCATION CREATES NEW PATHWAYS FOR WOMEN'S EMPOWERMENT

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ABSTRACT

In the 21st century, the convergence of education and technology has fundamentally redefined the landscape of women's empowerment. This paper explores how technology-enabled education is creating new and transformative pathways for women, particularly in the Indian context. Historically, women's access to education has been constrained by socio-cultural barriers, geographical isolation, economic limitations, and domestic responsibilities. Technology-enabled education, encompassing e-learning platforms, Massive Open Online Courses (MOOCs), mobile learning, Artificial Intelligence (AI) driven personalized learning, and virtual classrooms, is dismantling these traditional barriers. The study adopts a qualitative approach based on secondary data analysis, literature review, and case studies of national initiatives like SWAYAM, National Digital Library, and Digital Saksharta Abhiyan (DISHA). The findings reveal that technology enhances access, flexibility, affordability, and employability for women learners. It fosters digital literacy, entrepreneurial skills, financial independence, and participation in decision-making processes, thereby empowering families and transforming society. However, the paper also critically raises important ethical concerns including the digital divide, digital safety, privacy issues, misinformation, and the risk of technology dehumanizing the learning experience. It argues that future teachers must be equipped with digital competence, professional identity, and innovative teaching skills to balance digital innovation with human values. The paper concludes that while technology is a powerful enabler, its true potential for women's empowerment can only be realized through inclusive policies, digital infrastructure, gender-sensitive pedagogy, and ethical integration of technology in education.

Keywords: Women Empowerment, Technology-enabled Education, Digital Literacy, E-learning, Gender Equality, Ethical Concerns, Teacher Education.

INTRODUCTION

The famous quote by Brigham Young, "You educate a man; you educate a man. You educate a woman; you educate a generation," encapsulates the transformative power of women's education. Educating women empowers families and transforms society, as an educated woman not only improves her own life but also uplifts her family, community, and nation. In India, despite significant progress, women's educational attainment still lags behind men in many regions due to patriarchal norms, early marriage, domestic burden, and lack of safe transport. The advent of the Fourth Industrial Revolution has introduced Information and Communication Technology (ICT) into the heart of education. Technology-enabled education refers to the use of digital tools, platforms, and resources to facilitate learning, teaching, and assessment. This paradigm shift has created unprecedented opportunities to address gender disparities in education.

The objective of this paper is to analyse how technology-enabled education creates new pathways for women's empowerment and what are the implications for teacher education.

CONCEPTUAL FRAMEWORK: WOMEN EMPOWERMENT AND TECHNOLOGY-ENABLED EDUCATION

Women Empowerment: According to the United Nations, women's empowerment has five components: self-worth, right to make choices, access to opportunities and resources, power to control their own lives, and ability to influence social change. Education is the most critical tool to achieve it.

Technology-enabled Education: It includes:

- E-learning and MOOCs: Platforms like SWAYAM, Coursera, edX, NPTEL.
- Mobile Learning (M-learning): Learning via smartphones.
- Blended Learning: Combination of face-to-face and online learning.
- AI and Personalized Learning: Adaptive learning systems that cater to individual learning pace.
- Virtual Reality (VR) / Augmented Reality (AR): For immersive learning experiences.

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NEW PATHWAYS CREATED BY TECHNOLOGY FOR WOMEN'S EMPOWERMENT

- **Breaking Ecological and Social Barriers**

  For women in rural Punjab, Haryana, and remote areas of India, traveling to colleges is often restricted. Online education allows them to learn from home. During the COVID-19 pandemic, this became a lifeline for millions of girls who would have otherwise dropped out. A woman in Khanna can now attend a lecture by a professor at IIT Delhi through NPTEL without leaving her home.

- **Flexibility and Lifelong Learning**

  Many women discontinue education due to marriage and motherhood. Technology offers asynchronous learning – the ability to learn anytime, anywhere. Recorded lectures, flexible deadlines, and modular courses allow homemakers and working women to resume their education. This promotes lifelong learning.

- **Economic Empowerment and Employability**

  Technology-enabled education is directly linked to economic independence. Courses in digital marketing, coding, data entry, graphic designing, tailoring and fashion designing online, and financial literacy are empowering women to become entrepreneurs. Government initiatives like Women Entrepreneurship Platform (WEP) by NITI Aayog and Mahila E-Haat provide digital marketplace training. According to a report by GSMA (2023), women who are digitally literate are 25% more likely to find employment.

- **Access to Information and Health Awareness**

  Digital education platforms provide women with critical information on health, legal rights, reproductive health, and government schemes, which were previously inaccessible. This leads to better family health and decision-making.

- **Creating Role Models and Networks**

  Online communities, webinars with women leaders, and digital mentorship programs connect rural girls with urban professionals and global role models, building confidence and aspiration.

- **Promoting digital equity**

  While digital transformation paves the way for innovation, it also brings concerns about cyber threats and online safety. 2023 KPMG CEO Outlook highlights this, with 79 percent of CEOs believing AI could become a tool for adversaries alongside its potential for detecting cyber-attacks. Additionally, 14 percent of CEOs listed cyber security concerns as a potential risk to their business growth.

  These statistics underscore the need for robust mitigation strategies that address these evolving threats while promoting inclusivity and diversity within the workforce. Additionally, investing in women-focused cyber security awareness and education programmes empowers them with the knowledge and skills to navigate the online world confidently and securely, enhancing their employability.

- Empowering women in STEM

  Despite progress, women remain underrepresented in STEM careers. Encouraging more women to pursue these fields is crucial for advancing diversity and innovation. Initiatives like mentorship and scholarship programmes specifically targeted at women can inspire and enable them to excel.. By breaking down barriers and promoting equal opportunities, we engineer a welcoming environment that invests in women, celebrates their contributions and fosters their unique perspectives. This leads to a more vibrant and inclusive industry and workplace.

NATIONAL INITIATIVES IN INDIA

Government schemes for Women in Digital India:

- **Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA**): The Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA), launched in 2017 by the Ministry of Electronics & IT (MeitY), aims to empower six crore rural citizens with digital literacy. The initiative places a special emphasis on women, Scheduled Castes, Scheduled Tribes, and households living below the poverty line. It offers training in essential skills like using computers, making digital payments, and accessing e-governance services.
- **Digital Saksharta Abhiyan (DISHA):** The Digital Saksharta Abhiyan (DISHA) was launched in 2014 by the Ministry of Electronics & IT (MeitY) with the aim of boosting basic digital literacy. This

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initiative particularly targets women and rural communities, empowering them to access online education, banking services, and various e-services.

- **Mahila E-Haat:** Mahila E-Haat, launched in 2016 by the Ministry of Women and Child Development, is an innovative online platform designed for women entrepreneurs. It allows them to showcase and sell their products and services directly through digital technology. This initiative not only promotes financial independence but also encourages entrepreneurship among women.
- **Stand-Up India Scheme:** The Stand-Up India Scheme, launched in 2016 by the Ministry of Finance, aims to support women and entrepreneurs from Scheduled Castes and Scheduled Tribes by providing bank loans ranging from ₹10 lakh to ₹1 crore for establishing new industries. It also encourages digital transactions and simplifies the loan application process online.
- **Digital Beti Initiative:** The Digital Beti Initiative, launched in 2019 by CSC Academy and Facebook, is all about empowering rural women to step into the role of digital educators within their communities. They offer training that covers everything from online safety to promoting businesses and using social media effectively.
- **Beti Bachao Beti Padhao, (Digital Inclusion Component):** Beti Bachao Beti Padhao, (Digital Inclusion Component) launched in 2015 by the Ministry of Women & Child Development, is all about championing girls' education. It leverages digital platforms to raise awareness, facilitate e-learning, and keep track of educational progress.
- **National Rural Livelihood Mission (NRLM):** The National Rural Livelihood Mission (NRLM) launched its Digital Empowerment Drive in 2011 under the Ministry of Rural Development. This initiative aims to boost digital and financial literacy among Self Help Groups (SHGs), empowering them to engage in digital payments, e-banking, and entrepreneurship.
- **PMGDISHA (Pradhan Mantri Gramin Digital Saksharta Abhiyan)**: PMGDISHA, along with Women-Centric Projects under CSC, launched in 2018 by CSC e-Governance Services India Ltd., provides digital training programs tailored specifically for women. These initiatives aim to empower women by enhancing their skills in online banking, digital payments, and e-learning.
- **NITI Aayog's Women Entrepreneurship Platform (WEP):** NITI Aayog has created a digital one-stop platform to promote women-led startups and enterprises. This platform offers valuable resources like mentorship, access to funding, and skill development opportunities.
- **PMGDISHA–CSC Wi-Fi Choupal:** PMGDISHA–CSC Wi-Fi Choupal- 2018, MeitY & CSC is all about bringing internet access and Wi-Fi connectivity to rural villages. This initiative empowers women by giving them the tools to tap into online services, engage in e-learning, and manage their finances more effectively.
- **Stree Shakti Scheme**: The Stree Shakti Scheme, launched in 2000 by the Ministry of Women & Child Development (MWCD) in collaboration with banks (SBI and NABARD) is designed to empower women entrepreneurs by providing them with financial assistance and credit support. It encoura ges the use of digital transactions and online banking, while also promoting self-employment opportunities for women in small enterprises.
- **The National Digital Literacy Mission (NDLM):** The National Digital Literacy Mission (NDLM), also known as Digital Saksharta Abhiyan (DISHA), was launched in 2014 by the Ministry of Electronics and Information Technology (MeitY). Its goal is to ensure that at least one person in every household becomes digitally literate. The program focuses on training citizens, particularly women, in essential skills like basic computer operations, making online payments, navigating e-governance, and using the internet effectively. skills like basic computer operations, making online payments, navigating e-governance, and using the internet effectively.
- **The Digital Sakhi Programme:** The Digital Sakhi Programme, launched in 2015 by Bharatiya Mahila Bank (now merged with SBI) and L&T Financial Services as part of their CSR initiative, is about empowering rural women. It encourages them to become "Digital Sakhis". Act as digital ambassadors in local communities. This promotes cashless transactions and boosts entrepreneurship.
- **e-SHRAM Portal:** The e-Shram Portal, launched in 2021 by the Ministry of Labour and Employment in India, is a national database designed to help unorganized workers, including

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women, access social security benefits. Women can easily register online via a mobile platform to obtain a digital ID, which allows them to directly tap into various welfare schemes.

- **NCS (National Career Service) Portal:** The NCS (National Career Service) Portal, launched in 2015, is a fantastic digital platform that connects job seekers with employers, all under the guidance of the Ministry of Labour and Employment. It offers valuable resources like employment advice, skill development information, and online career counselling, thereby increasing women's participation in the workforce.
- **Udyam Registration Portal**: The Udyam Registration Portal, launched in 2020 by the Ministry of Micro, Small and Medium Enterprises (MSME), makes it easier for MSMEs to register their businesses. Women entrepreneurs can conveniently register their enterprises online, allowing them to tap into various government schemes, as well as gain access to digital marketing and e-commerce support.

CHALLENGES FACED BY WOMEN IN DIGITAL SECTOR:

- **Digital Gender Gap:** In India, women's use of digital technology still lags behind men. Many women do not own their own mobile phones or devices, meaning they often have to rely on family or shared resources. This dependency limits their ability to access digital media for education, job opportunities or starting their own businesses. Prevailing social structures and patriarchal attitudes contribute to this lack of access. Women's progress in the digital world is hampered by issues such as the unequal distribution of devices, changes in internet penetration rates, and gaps in technical knowledge. Although the Digital India Mission has made some progress in improving the situation, there is still a significant gap between rural and urban women in terms of digital access.
- **Limited digital literacy and skills:** It is a reality that many women still struggle with the technical knowledge required to navigate digital tools. Despite initiatives like NDLM and PMGDISHA, most women's training remains at the very primary level. This limits their ability to participate in key areas such as digital transactions, online learning, e-commerce and cyber security. Women in rural areas often find it difficult to access computer and internet training. In addition, language barriers and educational challenges make it even more difficult for women to achieve digital empowerment. As a result, we see a significant gap in women's participation in the digital economy and the technology industry.
- **Social and Cultural Constraints**: In India, patriarchal social structures and traditional ideologies actually prevent women from making technological advancements. In many households, women often have to ask permission to use the internet. They may face suspicion or criticism if they are active on social media. These social pressures keep many women away from participating in the digital world. In rural areas, the idea that the internet is primarily "for men" is still common.
- **Cyber Security and Online Harassment:** In today's digital world, women are at high risk of cyber bullying, online harassment, data theft and misuse on social media platforms. Due to this fear, many women are afraid to express their opinions or do business on the internet. Lack of knowledge about cyber laws and digital security makes it even harder for them to protect themselves. Many women fall prey to fake profiles, blackmail and data misuse.
- **Inequality in employment and representation**: Women are significantly underrepresented in the digital and IT sector. This gap is due to the underrepresentation of women in technical development. Many women are found to be only involved in micro-entrepreneurship or informal digital jobs. Unfortunately, they lack the mentoring, training, and networking opportunities that are important for building a successful career on digital platforms. This hinders women's career advancement.
- **Financial and infrastructure constraints:** Women in rural and low-income areas cannot afford the cost of digital devices. The cost of smartphones, internet connections and data plans is prohibitive for many households. In rural areas, lack of internet networks and frequent power outages are also common problems. These problems hinder women's ability to participate in online education, e-commerce and digital banking. Financial constraints limit their access to digital devices.
- **Language and content barriers:** In India, much of the digital content is in English, which is a real challenge for rural women and those with less education. There are not enough apps, e-learning platforms, or government websites available in local languages. This language gap makes it

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difficult for women to access essential services such as e-governance, e-commerce, and digital banking. As a result, many women avoid using digital tools due to these language barrier digital banking. Financial constraints limit their access to digital devices.

SUGGESTIONS

Technology-enabled education is not a magic wand, but it is undoubtedly a powerful accelerator for women's empowerment. It creates new pathways that are flexible, affordable, and scalable. It empowers a woman to learn, earn, and lead.

To maximize its impact, the following suggestions are made:

1. Improve digital infrastructure and provide subsidized internet and devices for girls.
2. Launch community digital literacy centers exclusively for women.
3. Strengthen laws and awareness campaigns for women's cyber safety.
4. Develop high-quality content in regional languages like Hindi and Punjabi.
5. Train teachers to be digitally competent and ethically responsible.

CONCLUSION

If we truly want to empower families and transform society, we must ensure that every woman is not just literate but digitally literate. The future of women's empowerment is digital, but it must be human-centric, ethical, and inclusive. Nothing is impossible when efforts and right vision is combined at large.

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