The Utilization of Artificial Intelligence for addressing the Gender Gap in Digital Literacy among Rural Women in India

-Ghorpade Snehal

Abstract:

In today's world, digital literacy has become a crucial factor in shaping individual and economic success. Nevertheless, India continues to face a notable gender based gap in terms of digital literacy. In India, cultural and social norms significantly influence women's engagement with and accessibility to digital technologies. The country's deeply rooted patriarchal structures often limit women's mobility, decision-making power, and educational prospects, female dropout in higher education, which are crucial for developing digital literacy. These challenges are particularly more noticeable in rural areas, where traditional gender roles are more rigidly enforced, thus diminishing women's opportunities to acquire the necessary skills for digital participation. Providing Digital access can be milestone on the path of women's empowerment. AI has the potential to address this problem. AI could help to reduce the gender gap in digital literacy. The purpose of this paper to discuss the various AI tools to increase digital literacy among women and make her empower.

Keywords: Digital Literacy, AI, Rural Women, Gender, Gender gap

Introduction:

- Definition (Digital Literacy): "Digital Literacy is ability to use digital technologies to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately. It also involves using digital technologies for problem-solving in all aspects of life."(UNESCO)

In the contemporary digital world, literacy extends beyond basic reading and writing skills to encompass the capacity to access, understand, and effectively utilize digital technologies. Digital proficiency has emerged as a fundamental element for socioeconomic progress, creating new opportunities in education, employment, and social interaction. Nevertheless, India faces a significant gender disparity in digital literacy, with women, especially those in rural and underprivileged areas, being disproportionately affected. As our world becomes increasingly digitized, the ability to navigate and leverage technology has evolved into a crucial skill set, commonly referred to as digital literacy. This encompasses a wide range of competencies, from fundamental computer skills to the proficient use of online resources for educational purposes, communication, and electronic commerce. Digital literacy serves as a pivotal factor in fostering economic growth, social empowerment, and civic engagement. Nevertheless, a substantial gap in digital literacy between genders poses a significant obstacle to achieving comprehensive development in India.

In India, females, particularly those from rural and economically disadvantaged sectors, encounter significant obstacles in achieving digital literacy. These challenges are complex, stemming from deeply ingrained sociocultural traditions, economic disparities, and inadequate infrastructure. Numerous communities adhere to patriarchal customs that limit women's access to educational and technological resources, thereby reinforcing conventional gender roles and restricting their opportunities for personal and career advancement. Moreover, economic challenges such as financial dependence and poverty further hinder women's capacity to obtain and utilize digital tools and resources. The consequences of this technological gap are extensive. Females who

are not digitally literate face challenges in numerous life domains, including learning, career opportunities, medical care, and civic engagement. The inability to navigate and use digital tools often excludes women from the benefits of the digital economy, such as online learning platforms, internet-based commerce, and digital banking services. This exclusion not only limits their personal growth but also reinforces wider gender disparities, impeding progress towards national development. Recognizing the importance of digital inclusion, the Indian government, along with non-governmental organizations (NGOs) and the private sector, has initiated several programs aimed at improving digital literacy among women. These initiatives, ranging from grassroots digital training programs to large-scale policy interventions like the Digital India campaign, seek to empower women by providing them with the skills and resources needed to participate fully in the digital economy. However, despite these efforts, significant gaps remain, and the progress has been uneven across different regions and social groups as government might lack in human resources but to counter such gap Artificial Intelligence (AI) can work wonder. This research paper aims to elaborate uses of AI to counter gender gap in digital literacy among rural women.

Methodology:

This study is based on secondary resources and various reports have been utilized.

What is Artificial Intelligence (AI):

- "The science and engineering of making intelligent machines, especially intelligent computer programs." - John McCarthy (1956)
- "The theory and development of computer systems able to perform tasks that typically require human intelligence." - Oxford English Dictionary
- Artificial intelligence (AI) is technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy.
- AI is used to describe the ability of computers or other machines to apply algorithms to reason and simulate human-like cognitive tasks, including reading, writing, interacting, problem solving, and decision making (Shang, 2021)

Use of AI to address female's issue and foster Digital literacy:

1. Education and Female Dropout: Education is life skill for any person. Well educated person is the biggest asset of any nation. But in India we can see huge gender disparity in education. According to UNICEF, 40% of girls drop out of school by age 14. "57% of girls in rural India don't complete secondary education" (ASER) "23% of girls in India marry before age 18" (UNFPA) This issue become worst when it comes to rural India. Below are few factors responsible for educational female dropout in rural area.

- Socio-Cultural factors: Gender bias and stereotypes, early marriage and family pressure, Domestic responsibilities, household chores, limited mobility and safety concern, norms favoring male education.
- Economic factors: Poverty and financial constraints, Lack of access to scholarships or financial aid, Limited job opportunities for women, High costs of education (e.g., fees, transportation)
- Educational Factors: Poor infrastructure (e.g., lack of toilets, separate classrooms), Inadequate teacher training and support, Limited access to quality education, Curriculum irrelevant to local needs, Lack of female role models and mentors

- Personal Factors: Health issues (e.g., menstruation, nutrition), Learning difficulties or disabilities, Pregnancy or motherhood
- Regional and Rural Factors: Limited access to schools and educational resources, Distance and transportation challenges, Lack of electricity, internet, and digital resources, Water and sanitation issues
- Female dropout in education and role of AI:

AI can help counter the issue of female dropout in education in India in several ways:

- Forecasting Analytics:

1. Detect students at risk: Machine learning-based predictive algorithms can examine student information to determine those with a higher likelihood of leaving school.
2. Customized support measures: AI-enabled platforms can recommend specific interventions tailored to students identified as at-risk.

- AI-Enhanced Online Education Platforms:

1. Improved educational opportunities: Artificial intelligence-powered online learning systems can enhance access to high-quality education, particularly in less developed regions.
2. Tailored instruction: Adaptive learning technologies driven by AI customize the educational experience to suit individual students' learning approaches.

- Chabot's and Virtual Assistants:

1. Support and guidance: AI-powered Chabot's can offer emotional support, guidance, and counseling.
2. 24/7 availability: Chabot's provide round-the-clock support.

- Computerized Surveillance Platforms:

1. Presence monitoring: Artificial intelligence-enhanced systems track student attendance.
2. Achievement monitoring: AI-based platforms monitor student progress.

- Material Generation and Management:

1. Appropriate content: Artificial intelligence-enhanced tools produce suitable, culturally appropriate materials.
2. Instant revisions: AI-based systems modify content immediately.

- Linguistic Assistance:

1. Text conversion: Artificial intelligence-enhanced translation tools support education.
2. Voice recognition: AI-based voice recognition technology assists in language acquisition.

- Mental Health Support:

1. AI-powered counseling: Chabot's and virtual assistants provide mental health support.
2. Emotional intelligence analysis: AI-driven systems analyze emotional intelligence.

- Scholarship and Financial Aid:

1. AI-powered matching: AI-driven systems match students with scholarships and financial aid.
2. Personalized financial planning: AI-powered tools provide financial guidance.

- Teacher Training and Support:

1. AI-powered teacher training: AI-driven systems provide teachers with training and resources.
2. Real-time feedback: AI-driven systems offer teachers real-time feedback.

These are few AI tools, AI generated programs and application of AI to counter the female dropout issue. It will not only help to reduce female dropout in education but will also help to give quality education.

2. Financial Illiteracy:

The condition of financial literacy among rural women in India is a pressing concern. According to sources, only 24% of rural women have basic financial knowledge (NFHS-5), 70% of rural women lack access to formal financial services (RBI) 45% of rural women rely on informal sources for financial information (SEWA), only 12% of rural women have a bank account in their name (PMJDY), 60% of rural women have limited or no knowledge of digital payments (NPCI) If we go through reasons behind this we can find there is Limited access to financial education, Low levels of formal education, Limited exposure to financial institutions, Cultural and social barriers and lack of digital literacy.

- Role of AI and Financial literacy:

AI can help address the issue of financial literacy among rural women in India in several ways:

- Artificial Intelligence-enhanced Financial Education Platforms:

1. Customized educational journeys
2. Engaging simulations and game learning
3. Instant evaluation and guidance
4. Inclusive features (such as voice-to-text and text-to-voice conversion)

- Electronic Financial Education Resources:

1. Smartphone applications (examples: Moneywise, FinLit)
2. Web-based learning environments (e.g., Financial Literacy India)
3. AI-powered conversational agents and digital assistants
4. Financial awareness initiatives on social networks (#FinancialLiteracy)

- Content Generation Using AI :

1. Computer-generated content production
2. Tailored information for women in rural areas
3. Support for multiple languages

- AI-Enhanced Learning Systems:

1. Conversational AI for educational guidance
2. Digital helpers for student assistance
3. Smart systems for providing feedback

- Enhancing Financial Service Accessibility:

1. Digital payment solutions powered by AI
2. Mobile platforms for broader financial participation
3. AI-based assessment of creditworthiness and loan provision

- AI Tools for Language and Literacy:

1. AI-enhanced language conversion software
2. Voice recognition for developing reading and writing skills
3. AI-powered platforms for language acquisition

These are few AI tools, AI generated programs and application of AI to address financial illiteracy. This will helpful in female financial inclusiveness, improved financial knowledge, enhance economic empowerment and reduce financial fraud etc.

- E-commerce, digital literacy and role of AI

Rural women engaged in e-commerce can benefit from digital literacy by gaining access to new prospects, expanding their customer base, and establishing their online presence:

- Expanding market reach: Digital technologies enable female micro-entrepreneurs and collectives to tap into previously inaccessible markets.
- Customer engagement: Smartphones allow women to interact with both local and urban clients, receive orders, and conduct business transactions.
- Developing online presence: Women can acquire skills in digital financial transactions, including the use of UPI and QR code-based payment systems.
- Community building: Social media platforms offer women opportunities to interact with consumers and receive positive product feedback.
- Skill enhancement: Platforms such as Facebook, Meta, and YouTube provide women with avenues to acquire new abilities, including vocational education and agricultural techniques.
- Household product acquisition: Women can utilize platforms like Meesho and the "Meri Saheli" app to purchase household items. Organizations such as Internet Saathi, a global Google initiative, can provide digital literacy training.

Conclusion:

In the 21st century, digital literacy has become a vital factor in personal empowerment, socioeconomic growth, and national advancement. The gender gap in digital technology access and usage in India highlights the need to enhance women's digital literacy, not just for inclusion but for transformative change. Tackling this disparity is crucial for achieving broader objectives of gender equality, poverty alleviation, and sustainable development. This paper has examined how the obstacles to women's digital literacy in India are deeply rooted in sociocultural norms, economic disparities, and infrastructure challenges. Patriarchal systems, which define gender roles and restrict women's access to education and resources, pose significant hurdles to their digital inclusion. Women's opportunities to develop digital skills are considerably limited by societal expectations that prioritize domestic duties and view technology as a male-dominated field. These cultural barriers are especially evident in rural and marginalized communities, where traditional gender roles are more strictly enforced and access to education and technology is already constrained.

We have explored the issue of female students dropping out of education, examining its causes and how artificial intelligence can address this problem by offering high-quality, affordable learning opportunities. Additionally, we delved into the topic of financial literacy and the gender gap in this area. We discussed how digital skills can enhance women's financial knowledge and the potential for AI to streamline this learning process. Lastly, we considered the role of e-commerce in women's empowerment, noting that active participation in online business can contribute to their economic independence.

Digital literacy offers women new opportunities for learning, economic involvement, and community participation, helping them surmount conventional obstacles and gain autonomy. Online platforms enable women to pursue education, launch enterprises, engage in digital commerce, and utilize electronic financial services, thereby enhancing their financial independence and boosting household earnings. Furthermore, digital proficiency grants women access to vital information and resources concerning health, legal entitlements, and governmental programs, substantially improving their welfare and living standards. Additionally, digital literacy empowers women in social and political spheres. By interacting with others through social networks and

virtual communities, women can exchange knowledge, find support, and champion their rights. Internet-based activism, facilitated by digital skills, has emerged as a potent tool for confronting patriarchal structures, increasing awareness of gender-related issues, and coordinating collective efforts. The capacity to engage in civic and political processes through digital means further amplifies women's influence and agency within society.

To conclude, promoting digital literacy among Indian women extends beyond mere technological access; it serves as a conduit for empowerment and a driver of broader societal transformation. By tackling the sociocultural, economic, and infrastructural impediments that hinder women's full participation in the digital realm, India can harness the potential of millions of women to contribute to and benefit from the digital economy. This, in turn, will have extensive ramifications for gender parity, economic expansion, and social progress. While the path to closing the gender digital divide is fraught with challenges, with the assistance of AI, India can attain the goal of a digitally literate populace. It also presents an opportunity to forge a more inclusive, equitable, and thriving society for all. Through coordinated endeavors and unwavering commitment, India can ensure that its digital future is one where every woman possesses the tools, abilities, and prospects to flourish.

References:

- Books and reports:

1. UNICEF (2020). Bridging the Digital Divide: Ensuring Children Have Equal Access to Digital Learning. UNICEF.
2. UNESCO (2019). A Lifeline to Learning: Leveraging Technology to Support Education for Refugees. UNESCO.
3. World Economic Forum (2021). The Global Gender Gap Report 2021. World Economic Forum.
4. International Telecommunication Union (ITU) (2020). Measuring Digital Development: Facts and Figures 2020. ITU.
5. National Commission for Women (NCW) (2020). Digital Empowerment of Women: A Study of Opportunities and Challenges. NCW India.
6. OECD (2018). Bridging the Digital Gender Divide: Include, Upskill, Innovate. OECD.
7. Niti Aayog (2020). India's Digital Inclusion: Advancing the National Mission for Digital Literacy. Niti Aayog.

- **Academic articles:**

1. Dr. Variath B. (2024). "Digital Literacy Among Women in India: Bridging the Gender Divide". IJRAIIE 10(4), 1-2
2. Ghatak, A. (2019). The Impact of Digital India on Rural Women: A Case Study of Ujjain District. Journal of Rural Development, 38(4), 587-598.
3. Bhagat, S. (2018). Digital Literacy and Gender Gap: A Study of Women in Urban India. Journal of Communication Studies, 10(3), 45-58.
4. Bhattacharya, S. (2020). Barriers to Digital Literacy Among Rural Women in India. Gender, Technology and Development, 24(1), 48-64.
5. Srinivasan, J., & Burrell, J. (2013). Revisiting the Fishers of Kerala, India. Journal of Development Studies, 49(7), 997-1013.

- **Online Resources and articles:**

1. Rashid N. (2021 April 27). "How Digital Literacy Can Bring in More Women to The Workforce". UNDP. https://www.undp.org/india/blog/how-digital-literacy-can-bring-more-women-workforce
2. Mishra S.(2024 May 10). "From rural roots to digital stars: Women's journey to buildinge-commerceconfidence!" //www.microsave.net/2024/05/10/from-rural-roots-to-digital-stars-womens-journey-to-building-e-commerce-confidence/#:~:text=Virtual%20groups%2C%20channels%2C%20and%20chatbots,liquid%20fertilizers%2C%20and%20animal%20nutrition.&text=Platforms%2C%20such%20as%20Facebook%2C%20Meta,and%20build%20their%20digital%20footprints.