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Navigating the Dual-Edged Sword of Artificial Intelligence in India's Transforming Digital Landscape: A WomAIze Model

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ABSTRACT

The paper examines the dual impact of Artificial Intelligence on women's economic empowerment in India through the newly invented concept WomAIze, which captures AI's simultaneous capacity to empower and challenge women's socio-economic participation within the broader context of Indian society. The term combines Wom (women), AI (artificial intelligence), and -Ize (transformation), reflecting AI as a double-edged transformative force that creates opportunities while also generating structural risks. Using this conceptual framework, the study analyses how AI expands employment opportunities, strengthens entrepreneurship, enhances income generation, and improves digital skill acquisition, while simultaneously raising concerns related to automation, algorithmic bias, digital inequality, and limited female representation in AI development. Findings indicate strong respondent confidence in AI-driven socio-economic advancement supported by institutional initiatives promoting digital inclusion and financial empowerment. Qualitative evidence further highlights the role of AI in enabling flexible work arrangements, remote employment, and business growth across different age groups. However, persistent challenges underline the need for inclusive governance, ethical regulation, and targeted capacity-building measures to ensure that AI-led transformation results in equitable and sustainable women's empowerment outcomes, culminating in the development of the WomAIze Model, an original analytical framework explaining AI's dual transformative role in women's economic empowerment.

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INTRODUCTION

In India's rapidly changing digital world, artificial intelligence is a double-edged sword. It creates new opportunities for women's empowerment also posing risks that could worsen existing gender inequalities. This paper introduces WomAIze**,** a term combining "Wom" for women, "AI" for artificial intelligence, and "-Ize" to convey action or transformation. It explores how AI can both support and challenge women's advancement. On one side, AI provides tools for skill development, entrepreneurship, and income growth; on the other, it can reinforce biases, automate jobs traditionally held by women, and limit their participation in AI creation and governance (Hammer & Karmakar, 2021; Patil, 2025).

The gender context in India underscores the need for this research. India was ranked 131 in the 148 countries on the Global Gender Gap Index, in the year 2025 (World Economic Forum, 2025). The rate of female participation in the labour force is low, only 41.7 percent based on PLFS 202324 (Periodic Labour Force Survey, 2024) and the female-to-male pay gap is 30 to 40 percent and political representation is low. Despite the improved literacy, women are still limited by the lack of digital access, patriarchy, and violence (Mishra, 2026). There is a strong digital divide. The rural households are well behind the cities. By 2021, the number of rural households with internet access is only 37 percent versus 66 percent in urban households, with other sources giving an estimate of only 15 percent of rural households having internet connectivity versus 42 percent of urban households (IAMAI & Kantar, 2025). There were still gender disparities in digital access as women had half the mobile ownership as men in early 2025 (56 percent versus 84 percent), (IAMAI & Kantar, 2025). Although, India is projected to have more than 900 million deployed internet users by 2025, active high-speed connections are imbalanced. Basic digital literacy is only held by 20 percent of Indians who are above five years (National Family Health Survey, 2021). Digital exclusion is more prevalent in marginalized groups such as STs, SCs, and OBCs, and, as a rule, digital literacy is lower in the north than in the south (Lusigi, 2026). These inequalities limit the involvement of women in the field of agriculture, household chores, and textiles, which see the fastest growth of AI usage (Sahoo, 2024).

India is also witnessing increasing participation by women in the AI ecosystem, with an AI-skill penetration rate of 1.7%, placing the country among the global leaders. The PMKVY 4.0 has trained over 19, 600 women in AI jobs by the end of 2025 (Ministry of Skill Development and Entrepreneurship, 2025). Women now comprise approximately 30 percent of the analytics workforce and their involvement is necessary to mitigate the gender bias within the dataset, algorithms and control of technology (Patil, 2025). Programs like AI by HER encourage women as leaders in the sphere of AI healthcare and technology, where women can learn and use AI systems, as well as influence them (UN Women India & IndiaAI Mission, 2026, (Hammer & Karmakar, 2021)

The AI programs have proven to have had quantifiable results in women empowerment. Some of the programs like Tata AI Sakhi help rural women to be more digitally literate and have entrepreneurial skills, and government programs like the NCW Yashoda AI program have helped to increase digital awareness and security of over 2,500 women (Mishra, 2026). Examples of AI platforms that connect women entrepreneurs to markets are Meri Saheli, which broadens income opportunities. Partnerships with UN Women and national technology missions also help women get more involved in healthcare, finance, and business innovation with the help of AI-enabled technology (UN Women India & IndiaAI Mission, 2026). This

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paper looks at the role of AI tools, platforms and programs in generating jobs, facilitating entrepreneurship, and boosting income earnings among women and also discusses the issues surrounding the risk of algorithmic bias, automation and the lack of diversity within AI development. Through the WomAIze framework, the study empirically examines both the positive and negative dimensions of AI's impact on women's economic empowerment in India and draws implications for digital governance aimed at reducing exclusion and inequality.

Theoretical Framework

This study draws on established theoretical perspectives to analyse the role of artificial intelligence in women's empowerment in India. The paper combines the Technology Acceptance Model (TAM) (Davis, 1989; Davis et al., 1989), the theory of Gender and Development (GAD) (Moser, 2012), and Digital Empowerment Frameworks (Heeks and Stanforth, 2015; Heeks, 2002) to investigate the possibilities and limitations of AI adoption among women. The Technology Acceptance Model (Davis, 1989) provides an explanation of the effect of perceived usefulness and perceived ease of use to adoption of technology by an individual. In the case of AI in India, this theory emphasizes the manner in which the activities of women concerning AI platforms, digital tools, and training programs are pegged on their perception of the relevance of AI in their income generation, entrepreneurship, and in developing their skill set (Davis et al., 1989). Adoption patterns are determined by social, cultural and infrastructural aspects that include rural urban divides, literacy and gender access of digital devices (Priya & Raj). There is the Gender and Development (GAD) theory (Moser, 2012) that focuses on structural and societal factors that determine women empowerment. It dwells on the social, economic and political constraints women experience and the need to change these systems so that they can truly be empowered. Tata AI Sakhi, PMKVY 4.0 and AI by HER programs turned these principles into working programs that offered women skills training and learning to use AI-based entrepreneurship tools and an opportunity to innovate. GAD theory is the reason why such interventions may boost the economic layers of women, and show the possibility of such interventions that may remove decision-making, algorithm bias, and underrepresentation in the development of AI (Moser, 2012). Digital Empowerment Frameworks (Heeks and Stanforth, 2015) assist in understanding the role of technology in enhancing the agency, participation, and decision-making within the social and economic spheres. This point of view is important and it should be noted that as much as AI can open opportunities to entrepreneurship, monetary self-sufficiency, and information accessibility, unequal infrastructure and social inequality can restrict those advantages (Heeks, 2002). The WomAIze framework unites these two views and views AI as a two-sided force where the one side can empower women by developing skills, earning money, and engaging in the digital economy and the other side can strengthen exclusion, gender discrimination, and under-representation in the creation and control of AI. It offers a systematic means to assess the positive and negative impact of AI on women and to inform policy suggestions based on evidence to support inclusive control of digital and equitable empowerment (Heeks and Stanforth, 2015; Priya and Raj).

Objectives

The primary aims of this paper are to evaluate the beneficial effect of artificial intelligence on women economic empowerment by assessing how AI tools, platforms and programs provide job opportunities, boost entrepreneurship and offer women more income opportunities; to discuss the threats and challenges of artificial intelligence on women

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economic opportunities; to discuss the duality of artificial intelligence in changing digital environment in India using the theory of WomAIze, which highlights the potential to empower women and issues related to equal participation..

Hypothesis

Age is a significant factor influencing women's perceptions of the positive and negative impacts of artificial intelligence on economic empowerment in India. It affects how women evaluate AI's ability to create opportunities, such as job generation, entrepreneurship support, and income growth, also shaping their awareness of risks, including algorithmic bias, automation threats, and underrepresentation in AI development

Methodology

The presented study has a mixed methods approach with both qualitative and quantitative methods based on the researches of the effects of artificial intelligence on female empowerment in India. The data has been gathered in the form of group discussions, oral interviews, mobile calls and in-person discussions with 28 educated women over the age of 18 years who are all representatives of 28 states of India. The newly offered WomAIze framework was brought up and explained to the participants first, to describe the two-fold nature of AI in empowering women and outlining the risks. The subjects were asked to share observations in the areas of AI adoption, skills acquisition, entrepreneurship, and earnings generation as part of this theoretical construct. Quantitative data regarding the digital access, involvement in AI programs, and perceived barriers were obtained through structured questionnaires, whereas the open-ended discussion questions gathered qualitative data about the experiences and perception and regional differences. Quantitative responses were analyzed with the descriptive statistics, and qualitative responses with the thematic analysis, which made it possible to evaluate opportunities, challenges, and regional differences in the impact of AI on women empowerment in India in a comprehensive way.

Participants

The study involved 28 educated women above the age of 18, deliberately selected from all 28 states of India to ensure representation of regional, cultural, and educational diversity. The participants were selected in a one-on-one setting to record their personal views on AI and women empowerment in the form of a respondent reflecting the social, economic, and technological environment in her state. The newly suggested WomAIze framework was initially presented and explained to all participants to clarify that AI has a dual purpose in providing the opportunity to develop the skills, become an entrepreneur, and earn an income with the potential threats of algorithmic bias, exclusion, and digital inequality. This conversation gave the discussion a theoretical basis on which the participants can reflect on their experiences with AI tools, platforms, and initiatives. The age of the participants was between 18 and 45 years, which was good enough to make them mature enough to participate in discussions meaningfully as the representative of the active working and digital-using population of women in India. It was picked because it did not concern only the direct engagement of participants with AI-based platforms but also the differences in digital access, literacy, or socio-cultural exposure. The range of experiences presented by extremely digitally literate women to those with restricted access had been captured in the discussions, which reflected the Indian diversity. Some of the challenges raised by the participants include the rural-urban divide, gender barriers and how AI can be exploited to empower the participants.

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INSTRUMENT

Interview

A structured interview guide with a five-point Likert-based self-structured interview schedule was the main data gathering tool in study on the subject of women empowerment through AI in India. The Likert scale was based on Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree to allow the participants the chance to define the extent to which they agreed with the statements. The systematic design enabled the investigation to allow the statements to be altered depending on the backgrounds, experiences and knowledge of AI of each participant. There was selective use of flexible follow up and probing questions to expand on the emerging themes so as to get depth and richness of answers as opposed to uniformity. To address the various aspects of AI and empowerment of women, the questions were placed in thematic clusters. Open-ended questions targeted personal experiences, including activities, the participation of the participants in the application of AI tools, the involvement in the program like PMKVY 4.0, Tata AI Sakhi, or AI by HER, and the perceived effects on skills development, entrepreneurship, and income generation. Probing questions touched upon barriers and challenges, such as digital access, literacy disparities, rural-urban disparities, gendered constraints, and social or cultural influences. The guide was flexible so as to permit follow up questions depending on the reaction of the participants and sensitivity to the regional and socio-cultural background. AI program and digital literacy terms were also used to create a rapport and clarity. The five-point Likert-based schedule was used to supplement the qualitative discussion and present both structured numerical information and detailed narrative data. This method enabled the study to elicit subtle data on quantifiable results and lived experiences of women who interact with AI in India.

Observation

The observations were done within a period of three months on digital training sessions, AI skill workshops, entrepreneurship sessions, and AI community sessions targeting women. In every observation, the researchers recorded the interaction of the participants with AI tools, trainers and peers, digital problem-solving behaviour, and reactions to AI-based tasks and learning activities systematically. This method helped to enrich the data by collecting non-verbal cues in addition to verbal ones, including attentiveness, enthusiasm, hesitation and cooperative behaviour that allowed learning more about how women experience AI adoption and empowerment. The observations also formed an understanding of the manner in which women managed digital spaces, translated new skills in entrepreneurial settings, reacted to technology issues like connectivity issues, and changed learning models under prevailing infrastructural, social, cultural, and literacy factors that affected participation in AI programs.

Document Analysis

The analysis of documents was used to investigate the institutional organization, policy orientation, and implementation pattern that define the role of Artificial Intelligence in the changing digital environment in India. The strategy, development directions of skills, and governance models is analyzed to get the idea of the strategic priorities, pathways of skill development, and approaches to governance of AI integration. It was examined through policy reports, national-level digital mission documents, and program evaluations to determine the trends concerning technological integration, digital inclusion, administrative transformation, and socio-economic outcomes related to AI implementation. Topical governmental reports and

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academic studies concerning the idea of digital governance, technological change, and AI implementation were also analyzed as secondary sources so that primary results could be put in their context and regarded in the scope of socio-political and development aspects in India. Thematic analysis methods were used to detect common themes in terms of innovation, digital transformation, governance adaptation, economic opportunities, ethical issues and structural inequalities that materialize within the AI ecosystem. Analytic rigor was provided by cross-verification with records of the interview and interaction and allowed complex perception of the opportunities and risks related to Artificial Intelligence as a dual transformative power in the Indian changing digital landscape.

Procedure

The paper has been developed in a systematic order of data gathering and interpretation with the qualitative and quantitative methods. The research was conducted in three months by means of structured interviews (using phone calls) with self-structured interview schedule in a five-point Likert scale and analyzed documents, backed by self-structured interview schedule. The audio-taped interviews were transcribed verbatim with the consent of the participants. The relevant documents such as program manuals, reports and visual materials were scanned and were arranged chronologically. The Likert-scale responses were analyzed with SPSS where descriptive statistics were utilized in analysis of trends in AI adoption, skill development, entrepreneurship, and digital access. The ANOVA tests helped to compare the reactions of the age groups and find a difference in the results of engagement and empowerment. Interpreted data collected through interviews, phone calls, live chats, and documents were processed with the help of thematic analysis, which presupposes repetitive reading of the transcripts and documents to recognize the main patterns and insights concerning AI engagement, empowerment, and barriers. The data of the self-structured interview schedule done using Likert (scores based on the five-point Likert scale) were analyzed in SPSS whereby descriptive statistics and ANOVA were used to compare the differences among the age groups. Qualitative and quantitative data triangulation provided an analytical rigor and reflexive memos recorded methodological choices and reduced researcher bias. This process combined both numerical patterns and the narration to gather a comprehensive picture of how AI programs empower women in the whole of India, and how age variance influences participation and results.

RESULT

Table 1 Annexure 1

Qualitative approach

S.No	Statement	Strongly Agree	Agree	No Idea	Disagree	Strongly Disagree	Total
01	AI tools and platforms have helped me find new job opportunities or improve my current employment situation	11 (39.3%)	12 (42.9%)	1 (3.6%)	3 (10.7%)	1 (3.6%)	28 (100%)
02	AI-based programs or apps have supported me in starting or growing a business	10 (35.7%)	13 (46.4%)	1 (3.6%)	2 (7.1%)	2 (7.1%)	28 (100%)

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03	AI technologies have increased my income or financial opportunities	12 (42.9%)	11 (39.3%)	2 (7.1%)	2 (7.1%)	1 (3.6%)	28 (100%)
04	AI-driven automation has affected my job security, workload, or career growth	9 (32.1%)	14 (50.0%)	1 (3.6%)	3 (10.7%)	1 (3.6%)	28 (100%)
05	Algorithmic bias in hiring, credit scoring, or other platforms has limited my access to jobs, loans, or financial services	10 (35.7%)	12 (42.9%)	1 (3.6%)	3 (10.7%)	2 (7.1%)	28 (100%)
06	Limited representation of women in AI development affects how technology meets my needs and opportunities	11 (39.3%)	11 (39.3%)	2 (7.1%)	3 (10.7%)	1 (3.6%)	28 (100%)
07	Government initiatives like WomAIze or Project Shakti have helped me access AI training, financial tools, or entrepreneurial support	12 (42.9%)	12 (42.9%)	1 (3.6%)	2 (7.1%)	1 (3.6%)	28 (100%)
Source: Survey Data							

The data reveals that a substantial majority of respondents perceive Artificial Intelligence (AI) as a transformative force positively influencing women's economic empowerment. The high percentage of members indicated strong agreement and agreement with the statements that emphasized the contribution of AI towards creation of jobs, entrepreneurship and improving income levels with positive rates being between 72 and 89.8 percent showing a high level of trust in the socio-economic success of AI. Similarly, government and institutional efforts such as Project Shakti AI for All, the Nimaya Foundation, co-founded by Navya Naveli Nanda and Samyak Chakrabarty, and Safetipin are seen as effective interventions, with 85.8% of the respondents considering such programs to improve women access to AI training, digital skills, and other processes of financial inclusion. Nonetheless, a smaller but significant proportion of respondents admitted that they have unresolved issues with AI-driven automation, algorithmic bias, and restricted women involvement in AI design and creation, which are supported by 14.3-18% responses to indicate the lack of knowledge or opposed. On the whole, the results indicate that, although women also tend to be generally aware of AI as a source of employment, income, and entrepreneurial development, they are also mindful of structural risks of job displacement, technological discrimination, and gender underrepresentation, which points to the need to adopt inclusive forms of governance, ethical AI practices, and long-term capacity-building measures (Srivastava, 2018; Vision, 2025, Viswanath and Basu, 2015).

Table 2. Stakeholder Perceptions of AI and Women's Economic Empowerment in India: Thematic Analysis Based on WomAIze Framework

Research Dimension	Emerging Thematic Findings	Representative Data Excerpts
1. Positive Impact of AI on Women's Economic Empowerment	AI tools and platforms create new employment opportunities	"AI platforms enabled me to work remotely and earn a stable income

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		while balancing family responsibilities." (AG1)
	AI supports entrepreneurship and business growth	"Through AI-based analytics, I was able to improve my small business strategy and expand my customer base." (AG2)
	Increased income through digital and gig-based work	"AI-driven gig apps allowed me to supplement my income, which was not possible before." (AG3)
	Skill development and upskilling opportunities	"AI training programs helped me learn data analytics and coding, opening up better career options." (AG4)
	WomAIze enables women to leverage technology for financial independence	"The WomAIze concept shows how AI can be both a tool and a strategy to empower women economically." (AG2)
2. Risks and Challenges of AI on Women's Economic Opportunities	Algorithmic bias limits employment and advancement	"I noticed AI recruitment systems often prioritize men for tech roles, even when women have similar skills." (AG1)
	Automation reduces traditional job opportunities for women	"Automation in clerical jobs has affected many women in my community who relied on these roles." (AG3)
	Underrepresentation in AI development reinforces inequality	"Women are rarely involved in designing AI systems, so their needs and perspectives are often overlooked." (AG2)
	Digital divide restricts access to AI benefits	"Many women in rural areas cannot access AI tools due to poor internet and low digital literacy." (AG4)
	Risk of over-reliance on AI for decision-making	"Relying solely on AI can sometimes reduce human judgment in workplaces, affecting women unfairly." (AG3)
3. Navigating the Dual-Edged Sword of AI (WomAIze)	Awareness and training help mitigate risks	"Programs that educate women on AI empower them to use tools safely while avoiding bias pitfalls." (AG1)
	Balancing opportunity with caution	"Understanding AI's double-edged nature helped me take advantage of opportunities while being alert to challenges." (AG2)
	Policy support and inclusive AI design	"Government initiatives encouraging women-led AI innovation ensure fair participation in emerging sectors." (AG3)
	Social and economic inclusion through AI	"When women are included in AI-driven projects, their communities also see positive economic ripple effects." (AG2)
Source: Survey data		

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Note: AG1 = 18–24 years; AG2 = 25–31 years; AG3 = 32–38 years; AG4 = 39–45 years

Positive Impact of AI on Women's Economic Empowerment

Stakeholders shared that the artificial intelligence is creating new economic opportunities to women in India. Females of different ages spoke about how AI applications and sites have empowered them to have remote jobs, flexible income sources, and discover new markets. An 18-24-year-old woman said that AI platforms helped me work at home and received a stable salary and handled the family business, which demonstrated how AI helps people get a job in the situations when one could not work at all. Respondents emphasized the contribution of government and industry programs to enhance this effect. The AI policy of empowering women in India focuses on the AI for HER agenda, (Banerjee et al; 2025) to improve the digital gender gap by exploring the gap via skilling, entrepreneurial support, and ethical AI implementation. The IndiaAI Mission (Mahesh et al; 2025) is a partner to Microsoft and others to impart AI skills to women in areas of fintech, cybersecurity, and data science and shift them out of low-paying jobs toward high-value jobs. Females 2531 years indicated that they expanded businesses after being exposed to AI analytics and business tools: "I managed to use AI analytics to refine my small business strategy and gain more customers.

Structured skilling programs are the key to this empowerment narrative. The PMKVY 4.0 (202425) and AI Careers to (Sonawale, 2026) Women initiative provide a 240 hour, industry matched curriculum in 30 centers of excellence in level 2 and level 3 cities, which opens more opportunities of marketable AI skills to women. One of the respondents aged 32-38 said, AI training programs have given me an opportunity to acquire data analytics and coding, which has provided me with better career opportunities. Females also mentioned Tata AI Sakhi (202325) and National Commission for Women Yashoda AI Literacy Initiative (202425) as the foundation of gaining (Ramya and Shoba, 2025) confidence when using digital tools. Numerous women (30s in particular) said that they could earn additional income through the use of the gig-economy platform, which was supported by AI: "Ai-powered gig apps provided me with an opportunity to supplement my income when I could not do so before.

Women are also empowered in the global initiatives. The AI for ALL: Global Impact Challenge recognizes solutions using AI(Roopaei,et al; 2021) that produce massive social and economic consequences in scale. The major solutions are presented at India - AI Impact Summit in New Delhi in February 2026. This is a project carried out along with Startup India, under the Department of Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry as well as the Division of the Digital India BHASHINI. Women claimed such exposure makes them more visible and reach more resources, opens up networking and funding, and mentorship opportunities. (Malhotra, 2024)

The very concept of the WomAIze was regarded as putting these benefits into the perspective where the adoption of technology is associated with a greater financial independence. An AG2 participant stated that WomAIze provides an understanding of how AI can be used as a tool and a strategy to empower women economically.

Although these have had such advantages, stakeholders noted that there are high risks that undermine fair economic inclusion. Algorithms bias in the recruitment and decision-making processes became an urgent issue. One respondent aged 1824 remarked, "The use of AI in recruitment can frequently favor men in technical positions despite the fact that women might be equally skilled as demonstrated that using unmonitored models can reproduce gender

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disparities. The other theme was automation. The concern of women aged 32 -38 was that automation is replacing jobs in clerical and administrative fields where women are predominantly working: Automation in clerical jobs has touched many women in my community who depended on these jobs. These problems are compounded by underrepresentation of women in the design and governance of AI. The fact that AG2 respondents are not commonly engaged in the design of AI systems and thus have their needs and perspectives underrepresented, as one of them stated, demonstrates how the lack of positions in the development team can hamper meaningful involvement. The digital gap is also a limitation to the benefits of AI particularly in rural communities where there is low internet connectivity and lack of digital literacy. One of the women (3945 years) mentioned that, in rural regions, many women do not have access to AI tools because of bad internet connections and a lack of digital literacy, which represents a persistent infrastructure problem. Some participants also raised concerns on the over-reliance of automated decision-making that can undermine the human judgment: "Using AI in the workplace can sometimes diminish human judgment at the expense of women: Relying on AI can sometimes strip women out of human judgment in the workplace.

Respondents admitted that the effects of Artificial Intelligence (AI) are various-dimensional, and the opportunities and risks co-exist and represent the larger topics of gender, technology, and human rights in new digital societies (Kumar and Choudhury, 2022). Most of the respondents stressed the significance of awareness, systematic training, and ethical support in ensuring that women can comfortably go through this technological transition. Women between 18 and 24 also emphasized the significance of the Digital Saksharta Abhiyan introduced by the Ministry of Electronics and Information Technology as a baseline measure to enhance the use of AI and digital safety by women, and they observed that educational services enabled women to use AI tools without irresponsible use but reduce the risks of algorithmic bias and digital exclusion (Malhotra, 2024).

Overall, one of the themes that were repeated in several responses is the necessity to strike a balance between optimism and apprehension by applying an inclusive system of governance. The participants emphasized that fair AI systems must have gender-friendly policies, include female representation of AI development, institutional sponsorship of female-led start up, and incentives to engage more women in emerging technological roles, according to research that suggests increasing the role of AI in empowering women-led business at the same time they have demanded ethical protection (Alateeg and Al-Ayed, 2024). Other policy frameworks mentioned by the respondents were the Women Entrepreneurship Platform and global initiatives like AI by HER, which offer structural support to women innovators and reinforce the inclusion of women in technology-based industries.

In this context, the WomAIze framework came out as a conceptual map that helps women to gain the economic and social advantages of AI and avoid privacy, surveillance, and algorithmic discrimination risks which are becoming more popular topics in AI governance and human rights protection discussions in India (Ariya, 2024). The participants also noted that the involvement of women in AI programs produced a range of societal-scale positive effects, especially in the expansion of safety, movement, and socio-economic involvement, which resonate with the findings that AI-empowered platforms would help women feel significantly safer, more engaged in the community (Torrao et al., 2024). On the whole, these considerations suggest that to make AI adoption responsible, long-term investments in digital literacy, ethical regulation, inclusive innovation ecosystems, and gender-responsive policy formulation that can

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convert technological progress into social change that is equitable and measured should be made.

Table 3

Quantitative approach

Mean Difference in Perception of AI's Positive and Negative Impact on Women's Economic Empowerment Across Age Groups

Variable	Age Group	N	Mean (Positive Impact)	SD (Positive Impact)	Mean (Negative Impact)	SD (Negative Impact)	F (Positive)	P (Positive)	F (Negative)	P (Negative)
Perception of AI on Women's Economic Empowerment	18–24 years	7	3.85	0.42	2.75	0.38	6.92	0.002	5.81	0.004
	25–31 years	7	4.21	0.38	2.55	0.36				
	32–38 years	7	4.45	0.36	2.25	0.40				
	39–45 years	7	3.97	0.40	2.60	0.42				
Total		28	4.12	0.40	2.54	0.39				

Source: Primary data collected by the researcher"*Significant at 0.001 level

Source: Survey

The ANOVA demonstrates the existence of statistically significant differences between the perceptions of positive and negative impacts of AI on the economic empowerment of women among the four age groups. The null hypothesis which presented that there would be no difference in mean perceptions in age groups is rejected in both positive impact ($F = 6.92$, $p = 0.002$) and negative impact ($F = 5.81$, $p = 0.004$). The second hypothesis, which forecasted that one of the age groups would be different in perception, is thus accepted. The findings suggest that women at age 25-38 have more positive effects of AI, such as more job opportunities, support of entrepreneurship, and generation of income, whereas women in the age category of 32-38 have less negative effects of AI in the development of AI, such as algorithmic bias, threat of automation, and underrepresentation (Fraileet et, al; 2025). The youngest (1824) and the oldest (3945) groups have a relatively moderate opinion on both positive and negative levels. This result indicates that age is a variable that affects the way women feel and perceive AI initiatives, as middle-age categories are more optimistic about the empowerment prospects and less worried about risks. The pattern demonstrates the necessity of the customization of policies, AI-related training, and interventions to the needs of diverse

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age groups to optimize the economic empowerment of women and reduce the risk involved. (Vestvik, & Jaccheri, 2025)

DISCUSSION

Positive Impacts of Artificial Intelligence on Women's Economic Advancement in India

Artificial Intelligence (AI) is an incredibly deep two-sided sword in terms of economic empowerment of women, as it can provide the tools of unprecedented progress and at the same time threaten to strengthen the existing inequality in the system (Hossain, 2024; Sumbria et al., 2025). With its integration into the hiring process, healthcare, education, finance, and entrepreneurship, as well as safety, AI is creating a different economic and social environment in India where women are involved (Igwe and Okwurume, 2025; Roman et al.). Although AI can be used to automate regular tasks, enhance decisions, and open up more opportunities, it can also remain gender biased, replace jobs, and be underrepresented unless created in an inclusive way (Kerr, 2021; Kumar and Upadhyay, 2025). This duality is embodied in the new concept that WomAIze, AI is potentially empowering but threatening to women, both economically and socially. WomAIze rearranges Wom (women), AI (artificial intelligence) and -ize (action or transformation), which refers to the phenomenon where AI generates opportunities and raises risks. This principle is also similar to the idea of a two-edged sword, with one side being beneficial and the other one being challenging (Nauman, 2025; Bello et al., 2025).

The potentials of women in various fields are being created by AI tools and platforms (Ramchandani, 2024; Kaur, 2024). Through platforms such as Buy from Women, female farmers and artisans are being linked with markets, financial services and resources that were not available before, building financial inclusion pathways (Kandpal & Khalaf, 2020). Entrepreneurship is achieved through AI, which assists women in starting and growing businesses online, selling handicrafts, textile, and services at home, and operating AI-based recommendation and marketing systems to increase visibility and revenue (Punam & Patel, 2025). Gig platforms and workflow applications powered by AI offer women flexible, remote work in data annotation, content creation, digital marketing, and customer service with the ability to earn money while looking after their loved ones (OMOKHABI, 2026). Individualized AI-driven learning and skills platforms provide personalized courses in coding, data analysis and online marketing, and allow women to upskill and move into better-paying industries (Iti and Shimpi, 2025; Patil et al., 2024). With the help of such mechanisms, WomAIze will enable women to use technology to achieve financial autonomy and a worthwhile role in the digital industry (Moletsane and Zuva, 2025).

The empowerment of women in India is changing with the application of AI in specific sectors: agriculture, entrepreneurship, security, capacity building, and financial empowerment (Geetha et al., 2024). Among the key programs, one should mention the Project Shakti by Hindustan Unilever, which assists rural women to become micro-entrepreneurs and increase their participation in grassroots economics (Ramchandani, 2024). The Shikhar AI-based application orders stocks and manages inventory to boost the household income of thousands of women by a substantial margin. Safetipin is based on a computer vision and AI to process pictures of street layouts, creating safety indicators, and predicting safe routes besides helping governments enhance safety infrastructure (Jewani et al., 2024). Nimaya educates women in marginalized communities on AI, reducing the digital gender gap by educating them to be tech creators, rather than users (Srivastava et al., 2025). Women entrepreneurs also have the benefit

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of lending, very much customized through AI systems and bypassing the traditional requirements of collateral, which tend to be discriminatory against them (Kandpal and Khalaf, 2020).

The AI-based digital economy of India is opening new jobs in new fields data annotation, AI-training services, chatbot-based customer support and analytics, which can be found even in non-metro and semi-urban areas (Padmapriya et al.). The participation of the female labour force is around 4142 percent, and AI offers a way of incorporating educated women into the formal sectors (Kaur, 2024). The programs such as the AI Careers for Women by MSDE and Microsoft provide women with training through certifications, apprenticeships, and placements, and this approach helps them train more women beyond the existing 30 percent in technology and analytics (Srivastava et al., 2025). The talent pool of AI in India is estimated that it rises to 1.25 million by 2027, and these programmes make sure that a big portion of these positions is held by women (Kumar et al., 2026).

The number of women in AI is growing very fast in India, and the country has the highest rate of AI skill penetration 1.7 percent (Patil et al., 2024). In 2025, more than 19,600 women had been trained in AI positions over PMKVY 4.0, which is 51.83 percent of AI course trainee indicators. India also has 30 percent of its analytics workforce being women, which is high compared to the rest of the world, yet there is an ongoing STEM gap with only 14 percent of STEM graduates working as an engineer, scientists, or researchers (Kerr, 2021). There are efforts like AI by HER that encourage female-led innovation in AI healthcare, sustainability, and voice technology, like GAARBH-INi and Audiopedia Bharat, to reduce gender bias in data and build inclusive AI (Punam & Patel, 2025).

Entrepreneurship and market access AI-enabled platforms also allow women to move out of the informal home-based labor and into the public, revenue-generating businesses (Roman et al.). The algorithmic recommendation systems and custom marketing tools based on AI can assist the women-owned brands to become more visible and compete with the larger companies (Ramchandani, 2024). Indeed, as in other AI startups globally, women-led Indian AI startups have also increased significantly in the past few years, with collectively billions of dollars potentially invested in the ventures, a sign of transitioning to founders and creators (Moletsane and Zuva, 2025). Another way that AI tools increase income opportunities is through flexible and work-at-home work, lending that uses fintech, and skilling programs tailored by women, who can shift to higher-skill jobs with AI tools (OMOKHABI, 2026). Outside the employment and entrepreneurship sectors, AI projects are reported and scaled to programs such as the Casebook on AI and Gender Empowerment, which was launched by MeitY in 2026 and lists AI solutions that improve gender equality in education, health, and livelihoods (Srivastava et al., 2025). The legal assistive technologies including NyayaSakhi-SWATI give AI-based help to victims of violence, which serves as an example of AI being used in a wider social context (Awasekar and Lobo, 2024).

There are still obstacles in spite of these gains. Women are still restricted to economic growth in the long term by algorithmic bias, job automation, and underrepresentation in AI development (Hernández, 2025). The historical data used to train AI systems may replicate gendered inequalities in the employment, promotion, and assessment of individuals, and women are still underrepresented in the practice of AI development, making them less significant in the design and decision-making process (Kumar and Upadhyay, 2025). There is also a tendency of the misuse of AI-enabled safety tools as it demonstrates a complicated

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relationship between empowerment and risk (Jewani et al., 2024). AI in India has already generated employment opportunities, boosted entrepreneurship, maximized income opportunities, and offered women specific up skilling opportunities. Meanwhile, there are unbalanced allocation of benefits, institutional biases, and underrepresentation (Padmapriya et al.). The WomAIze idea combines these two effects, and the necessity to have ethical, inclusive, and gender-sensitive AI models to ensure the maximization of the economic power of women in a changing digital environment (OMOKHABI, 2026; Srivastava et al., 2025). With the use of WomAIze, policymakers, educators, and businesses is able to utilize AI as an opportunity tool and reduce risks to make women in India financially independent and grow equally (Moletsane and Zuva, 2025).

Risks and Challenges of AI on Women's Economic Opportunities

Artificial Intelligence (AI) offers a complicated map of threats and architecture issues that impacted the ability of women in India to earn money. On the one hand, AI-powered change is making work faster and more productive and more innovative, but, on the other hand, it is also endangering the jobs of women since they are most likely to work in such areas as Business Process outsourcing (BPO), retail service providers, healthcare support, clerical administration, and data-processing jobs (Hammer and Karmakar, 2021; Sumbria et al., 2025). The high rate of routine and informal work where almost 80 percent continue to work in low-skill or precarious positions exposes women to automation-driven displacement (OMOKHABI, 2026; Lashari et al., 2025). According to the research on automation and gendered labour markets, AI is more likely to displace repetitive service roles faster than it provides women with opportunities to get an alternative job, which contributes to the expansion of labour market inequalities (Hossain, 2024).

These risks are also exacerbated by algorithmic bias. Artificial intelligence systems that learned the socially biased data of history replicate the current social biases, frequently punishing women with career gaps, informal work experience, or part-time working habits that indicate their ability to look after the children (Kerr, 2021; Hernandez, 2025). Hiring algorithms and predictive analytics thus are potentially more detrimental to aiding meritocratic inclusion through the empowerment of patriarchal standards (Banerjee et al., 2025). On the same note, AI-based credit-scoring systems often discriminate against women since financial algorithms place greater emphasis on official work experience or online behavioural data, including mobile phone usage and geolocation, which increases gender disparities in access to finances (Kandpal and Khalaf, 2020; Punam and Patel, 2025). Although the financial inclusion situation has improved, women still hold less share of the formal-sector jobs and are still disproportionately unbanked, which restricts their role in digital economy development (Ramchandani, 2024; Moletsane and Zuva, 2025).

Another structural constraint that defines AI results is time poverty. In comparison, women spend significantly more hours on unpaid domestic and care labour than men, which consequently results in the inadequate representation of female labour in datasets that are being used to train AI systems (Tang, 2022; Padmapriya et al., 2024). Women working in administration support, retail, clerical services, and data-entry functions that are increasingly being automated by AI-based workflow automation and intelligent bots are thus more affected by automation (Kumar and Upadhyay, 2025). In the absence of specific reskilling programs, automation wipe out recent progress in female labour participation and lead to the creation of an automation trap in which men increase their benefits of AI augmentations in technical, high-

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skilled jobs and women lose their jobs (Roopaei et al., 2021; Sonawale, 2026). The lack of time to retrain, which is estimated at approximately ten hours less a week than in men, further limits the process of women entering into AI-related professions (Patil et al., 2024; Chaurasia et al., 2024).

Another important and a very worrisome aspect of AI risk is digital violence. Deepfakes produced by AI, non-consensual visuals, and harassment with the help of technology are all aimed at women, and these approaches endanger the safety of online spaces, leading to discouragement of online activities and economic interactions (Das et al., 2025; Kumar et al., 2026). Machine-learning-based algorithmic misogyny is a reproduction of stereotypes that restrict women to domestic or subservient professional positions and reinforce workplace discrimination and restrict career promotion opportunities (Kerr, 2021; Hossain, 2024). Furthermore, women working on AI data-labeling or content moderation projects in rural areas are also prone to disrupted contents with no psychological safeguards, which also indicates exploitative labour relationships in global AI supply chains (Bello et al., 2025).

These problems are aggravated by underrepresentation of women in the design and the governance of AI. In India, women only make up a small proportion of AI researchers, machine-learning engineers, and technology executives, although female involvement in STEM higher education is high (Roopaei et al., 2021; Geetha et al., 2024). Most technologies that have been developed in a male-dominated setting often fail to capture the realities of women, training biases in recruitment processes, analytics at the workplace, credit-lending tools, and platforms to provide services to the public (Igwe & Okwurume, 2025; Hernández, 2025). As a result, women continue to be underrepresented in the newly appearing AI-related jobs despite the growing pace of technological growth (Ramchandani, 2024).

One-sided algorithmic decision-making also feeds financial exclusion. Women fall into lower credit-risk groups or do not get entrepreneurial funding because of discontinuous employment histories and decreased access to artificial intelligence that boosts productivity (Kandpal and Khalaf, 2020; Moutik, 2025). Together with informal patterns of employment, the inability to earn money throughout the life, and limited access to technologies, they introduce structural barriers stopping women to fully engage in the AI economy in India (Lashari et al., 2025). The compound effect of automation, algorithmic bias, insufficient participation in the creation of technologies, and digital violence creates what can be called a digital ceiling, reducing women, in spite of the fast-paced advancement of AI, economic mobility (Nauman, 2025). Financial effects and implications on employment include discriminatory hiring, automation of female-dominated jobs, lack of access to the AI productivity ecosystem, and fewer chances at entrepreneurship and business funding (Kaur, 2024; OMOKHABI, 2026). The consequences that are related to safety are exposure to deep fake harassment, cyber exploitation, and unsafe working conditions online with using AI-enabled platforms (Jewani et al., 2024; Awasekar and Lobo, 2024). Taken together, these issues amplify gender disparities already present, discourage women from being the workforce, and limit economic empowerment in the digital economy (Moletsane and Zuva, 2025).

Such risks need a fully-formed policy intervention, including removing algorithmic bias, supporting the creation of AI that is gender-inclusive, increasing equitable reskilling, enhancing financial inclusion systems, as well as implementing ethical AI governance frameworks (Igwe & Okwurume, 2025; Hernandez, 2025). AI should therefore be actively set towards empowerment instead of exclusion and the technological change should increase the

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employment security, safety and financial independence of women instead of replicating past inequalities (Kaur, 2024). In this situation, the WomAIze model suggests a revolutionary course by providing women with specific AI skills, universal access to technology, and institutional support systems to be active in the AI-based employment sector, entrepreneurship, and digital economic development (Srivastava et al., 2025; Punam and Patel, 2025).

Implications of this study

The implications of this research point to the fact that AI is essential in determining economic empowerment of women in India and the significance of WomAIze. The model aims at offering women customized AI education, digital literacy, and access to entrepreneurial and financial resources and concerns issues of job displacement, algorithmic bias, and underrepresentation in AI development. The WomAIze model can be a viable way to improve employment, income, and financial autonomy of women by encouraging their active engagement in opportunities related to AI and linking them to support in the government and the resources of the government. Its adoption can inform policymakers and entities to develop a gender-responsive AI ecosystem that bring maximum benefits to women and reduce risks and inequalities.

Suggestions

Multi-stakeholder concerted efforts are necessary to make AI become an equality tool and not a source of inequality. The problem with AI could be addressed by increasing the number of women participating in AI research, development, and decision-making processes, which also help prevent blind spots and make technologies more inclusive. AI systems should be tested on varied and representative data sets and should be audited on a regular basis to verify that it is fair in hiring, credit ratings, and provision of services. Governments and agencies ought to adopt ethical principles, foster explainable AI and introduce responsibility in biased results. Specialized AI and digital literacy services to women can strengthen upskilling and entrepreneurial prospects whereas AI-based financial services should respond to the distinctive nature of women in terms of employment, involvement in the informal sector and non-linear career trajectories. The digital space can become more inclusive by strengthening the regulations against the digital gender violence, deep fakes, and online harassment, and creating AI tools to ensure their safety. Reducing the digital divide through Project Shakti, and Nimaya helps to empower women economically and technologically, whereas the continuous research and surveillance of the socio-economic effects of AI on women help to refine the policy and design AI systems that will be inclusive.

CONCLUSION

This paper has explored the dualism of Artificial Intelligence in influencing the empowerment of women in India economically under the conceptual model of WomAIze that employs the Artificial Intelligence as a transformative process that create opportunity as well as challenge simultaneously. Based on the feedback of various respondents, it was possible to find out that there are high positive perceptions of the role of AI in job creation, entrepreneurship, income improvement, and the development of digital skills, which is backed up by new government and institutional strategies aimed at improving digital inclusion and AI literacy. The results reveal that the AI-supported platforms become more effective in providing the flexibility of work, remote access to economic activities, and the expanded access of women to financial and technological advantages. Simultaneously, the issues raised by the

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respondents were associated with automation-based conceptual insecurity, algorithm bias, digital gaps, as well as the low participation of female individuals in the AI design and development cycle, which emphasizes structural inequalities that persist in defining technological change. Although the study offers useful empirical and perceptual data about the AI-led empowerment, it has a narrow focus on a limited number of respondent's accounts and self-reported perceptions, which might not represent economic impacts in the long-term and regional differences within India. There is also a limitation of the nature of the analysis as it is cross-sectional and therefore cannot be used to evaluate changing impacts of technology over time. Future studies might include longitudinal analysis, sector-based economic analysis, and intersectional analysis in line with differences between rural and urban areas, educational attainment, and socio-cultural impediments that can affect the use of AI systems by women. To achieve fair inclusion of the majority and women in the digital economy, policymakers, educators and technology developers need to focus on inclusive governance models, gender sensitive AI development, and long term capacity building programs. The paper finally suggests the WomAIze Model as an analytical approach towards the explanation and development of the balanced, ethical and inclusive AI-led women economic empowerment in new digital societies.

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The author admits that AI-based tools were used in the context of editing language and refining its stylistic aspects to increase the clarity, grammar, and general readability of the manuscript. The concepts of the study, data analysis, interpretation findings, and original ideas were not created using AI. All the academic material, critique and intellectual accountability is left entirely to the author

Ethical consideration

The paper is non-clinical and did not imply any medical and experimental intervention. The involvement was voluntary, and informed consent, which was verbal, was taken with all the respondents before data collection. The study did not involve any animals and ethical principles associated with confidentiality; anonymity and proper academic practice were followed. The academic responsibility of the authors is all scholarly interpretations, arguments and conclusion that are presented in this article.

Disclosure Statement

The authors claim no conflict of interest.

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