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Role of Artificial Intelligence in Advancing Education, Employment, and Entrepreneurship Opportunities for Afghan Women

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Abstract:
The rapid advancement of artificial intelligence (AI) presents transformative opportunities for education, employment, and entrepreneurship, particularly for Afghan women who face persistent socio-cultural and structural barriers. This study examines the role of AI in enhancing women's access to learning, workforce participation, and entrepreneurial activities in Afghanistan. The primary objectives were to assess how AI-driven platforms and tools can improve educational outcomes, facilitate employment opportunities, and support business development for women. A quantitative survey was conducted among 110 female students and aspiring entrepreneurs across diverse faculties, including Computer Science, Nursing, Economics, English, and Midwifery. Data were collected through structured questionnaires covering perceptions, preferences, and challenges related to AI adoption, and were analyzed using descriptive statistics. Findings indicate that AI-based skills training and upskilling programs, online learning platforms, and digital financial services are perceived as the most beneficial interventions. Respondents highlighted barriers such as limited internet access, lack of digital literacy, and cultural restrictions. Overall, the study concludes that AI can serve as a catalyst for women's empowerment in Afghanistan, provided it is complemented by training, accessible technology, and supportive networks. These results underscore the need for targeted policies and programs to leverage AI for promoting gender equity and inclusive socio-economic development.

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INTRODUCTION

The rapid advancement of artificial intelligence (AI) technologies is reshaping societies worldwide, offering transformative opportunities in education, employment, and entrepreneurship. For Afghan women, who face systemic barriers to social and economic participation, AI presents both a challenge and a pathway toward empowerment. In Afghanistan, historical, cultural, and political constraints have limited women's access to higher education, digital literacy, and entrepreneurial resources (Afif et al., 2024). Yet, recent studies demonstrate that digital platforms, internet access, and AI-driven solutions can significantly enhance gender equality and participation in knowledge-based economies.

Education is a critical domain where AI can play a central role. Afghan women have often struggled with barriers to attending schools and universities due to restrictive norms and security issues. AI-supported learning systems, such as adaptive education platforms and online universities, create new possibilities for personalized learning, remote access, and flexible education for women and girls (Karimy et al., 2024; Hassani et al., 2025). Research on ICT and digital literacy further highlights how technology adoption enhances teaching and learning outcomes, offering Afghan women a chance to bridge educational gaps and actively contribute to societal transformation (Hakimi et al., 2024; Hakimi et al., 2025).

In terms of employment, AI introduces innovative avenues for workforce participation. Studies emphasize that AI-powered platforms, automation, and digital tools reduce traditional employment barriers, allowing women to engage in remote work, digital freelancing, and professional skill development (Amiri et al., 2024; Nabizada et al., 2024). For Afghan female engineers and professionals, however, structural inequalities and limited access to resources remain persistent challenges (Mehrzad et al., 2023). Nonetheless, AI can facilitate skills training, job-matching systems, and digital mentoring, empowering women to participate in both local and global labor markets.

Entrepreneurship represents another critical area where AI can support Afghan women's empowerment. Research shows that Afghan female entrepreneurs face unique challenges, including lack of access to financial capital, gender discrimination, and limited market exposure (Wafeq et al., 2019; Mehrzad et al., 2023). AI tools ranging from predictive analytics for market trends to digital financial platforms can enable women to manage resources more effectively, expand outreach, and strengthen business decision-making. Recent scholarship also emphasizes the role of digital ecosystems and internet access in creating entrepreneurial opportunities that challenge traditional gender norms (Shaikhzada et al., 2025; Afif et al., 2024).

Taken together, the integration of AI into Afghanistan's education, employment, and entrepreneurship landscapes offers a promising but complex pathway toward women's empowerment. While challenges of digital divides, cultural barriers, and governance remain significant, scholarly evidence underscores that AI-driven innovation can serve as a catalyst for gender equality and sustainable development in Afghanistan (Hakimi et al., 2024; Shaikhzada et al., 2025).

The first objective of this study is to examine the role of artificial intelligence in advancing educational opportunities for Afghan women. This involves assessing how AI-driven platforms, digital literacy programs, and adaptive learning technologies can overcome barriers to access, enhance personalized learning, and foster greater participation of women and girls in academic settings where traditional pathways are often restricted.

The second objective is to evaluate the potential of AI technologies in improving women's employment prospects in Afghanistan. This includes exploring how AI-powered tools such as automated job-matching systems, remote work platforms, and skill

development applications can empower Afghan women to participate in the labor market more effectively, despite social and structural constraints that continue to limit their workforce inclusion.

The third objective is to investigate how AI can facilitate women's entrepreneurship and business innovation in Afghanistan. By analyzing the role of AI in market research, digital financial services, and resource management, this study seeks to determine how women entrepreneurs can leverage AI to overcome challenges such as limited access to capital, restricted networks, and gender-based discrimination, thereby promoting inclusive economic growth and sustainable development.

RESEARCH METHODS

This study adopted a quantitative survey-based research design complemented by qualitative insights to explore the perceptions of Afghan women regarding the role of artificial intelligence (AI) in education, employment, and entrepreneurship. The choice of a survey-based approach enabled the collection of structured data from a sizable population, ensuring the reliability and generalizability of the findings while capturing diverse perspectives across multiple disciplines.

Population and Sample

The study targeted female students and aspiring women entrepreneurs in Afghanistan, particularly those enrolled in faculties such as Computer Science, Nursing, Economics, English, and Midwifery. A total of 110 respondents participated in the survey, ensuring sufficient representation from both technology-oriented and non-technical academic fields. The sampling approach was purposive, focusing on participants who had exposure to digital tools or an interest in AI technologies, thereby enhancing the relevance of the collected data.

Data Collection Instruments

Data were gathered using a structured questionnaire comprising closed-ended questions designed to measure respondents' perceptions, preferences, and challenges associated with AI adoption. The questionnaire was divided into four main sections: (1) demographic information, (2) perceptions of AI in education, (3) preferences for AI-based employment support, and (4) AI tools for entrepreneurship and motivating factors for adoption. Questions were measured using Likert scales and frequency-based options to quantify the responses.

Data Collection Procedure

The questionnaire was distributed both online and offline to reach participants across urban and semi-urban areas. To ensure clarity, the survey was available in Dari and English, accommodating language preferences. Participants were briefed about the study objectives, assured of confidentiality, and encouraged to respond honestly to avoid response bias.

Data Analysis

Collected data were analyzed using descriptive statistics, including frequencies, percentages, and tabular summaries to identify trends and preferences. The results were then interpreted to understand the role of AI in enhancing education, employment, and entrepreneurship opportunities for Afghan women. Additionally, qualitative insights from open-ended responses were incorporated to contextualize the quantitative findings and provide a nuanced understanding of participants' experiences and challenges.

Ethical Considerations

The study adhered strictly to ethical standards, ensuring informed consent, voluntary participation, confidentiality, and anonymity for all respondents. Participants were also given the option to withdraw from the study at any stage without consequence.

This methodology ensured that the research was systematic, reliable, and capable of generating actionable insights into the potential of AI to empower Afghan women across multiple socio-economic domains.

RESULTS

This section presents the findings of the study, reflecting the perceptions, preferences, and experiences of Afghan women regarding the role of artificial intelligence (AI) in education, employment, and entrepreneurship. Data were collected from 110 participants across diverse academic and professional backgrounds, ensuring a comprehensive understanding of the challenges and opportunities associated with AI adoption. The results are organized into thematic areas, including AI-supported educational tools, employment interventions, entrepreneurial applications, and motivating factors for technology use. Through descriptive analysis, the findings highlight both the potential of AI to empower women and the structural barriers that must be addressed to maximize its impact.

Table 1. Demographic Distribution of Respondents by Faculty

Faculty	Number of Respondents	Percentage (%)
Computer Science	30	30.0%
Nursing	20	20.0%
Economics	20	20.0%
English Department	30	30.0%
Midwifery	10	10.0%
Total	110	100%

Table 1 presents the demographic distribution of the survey respondents across five faculties. A total of 100 female students participated, ensuring a balanced and diverse representation of academic backgrounds. The largest groups were drawn from the

Computer Science and English departments, each contributing 30 respondents, which corresponds to 30 percent of the total sample. This significant share from two faculties highlights the strong involvement of students from both technology-oriented and language-focused disciplines. Nursing and Economics faculties each accounted for 20 participants, representing 20 percent of the respondents respectively, thereby providing perspectives from both healthcare and business fields. The smallest group came from the Midwifery faculty, with 10 respondents, making up 10 percent of the sample. Although relatively smaller, this group added valuable insights from a specialized healthcare perspective. Overall, the distribution indicates a diverse academic mix, ensuring that the findings reflect multiple disciplinary viewpoints and strengthening the validity of the study.

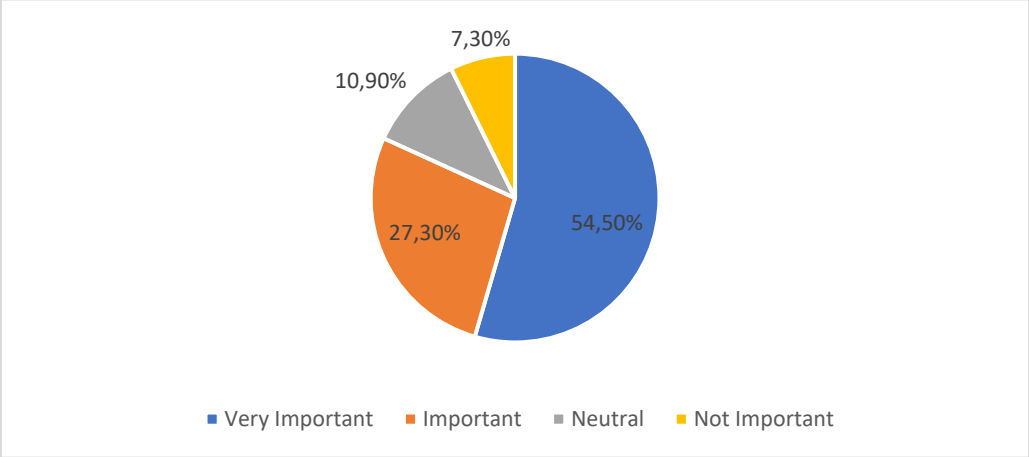


Figure 1. Respondents' Perceptions on the Importance of AI for Women's Access to Education in Afghanistan

Figure 1 summarizes respondents' perceptions regarding the importance of Artificial Intelligence (AI) in improving women's access to education in Afghanistan. Out of the 110 participants, a majority (54.5%) considered AI to be *very important*, highlighting strong optimism about the role of emerging technologies in addressing long-standing barriers to education. Another 27.3% indicated that AI is *important*, suggesting that even among those who did not select the highest option, there remains a clear acknowledgment of AI's positive potential. Meanwhile, 10.9% of the respondents expressed a *neutral* opinion, reflecting uncertainty either due to limited awareness of AI applications or skepticism about its feasibility in the Afghan context. Only a small fraction (7.3%) viewed AI as *not important*, which could stem from concerns about infrastructure, digital divides, or socio-cultural restrictions. These findings demonstrate that nearly four out of five respondents believe AI can play a pivotal role in expanding educational opportunities for Afghan women. The overwhelmingly positive perception indicates strong support for integrating AI-driven tools, such as online learning platforms, intelligent tutoring systems, and language translation technologies, into educational initiatives. This evidence suggests that policies and programs promoting AI in education may receive high levels of acceptance among Afghan female students.

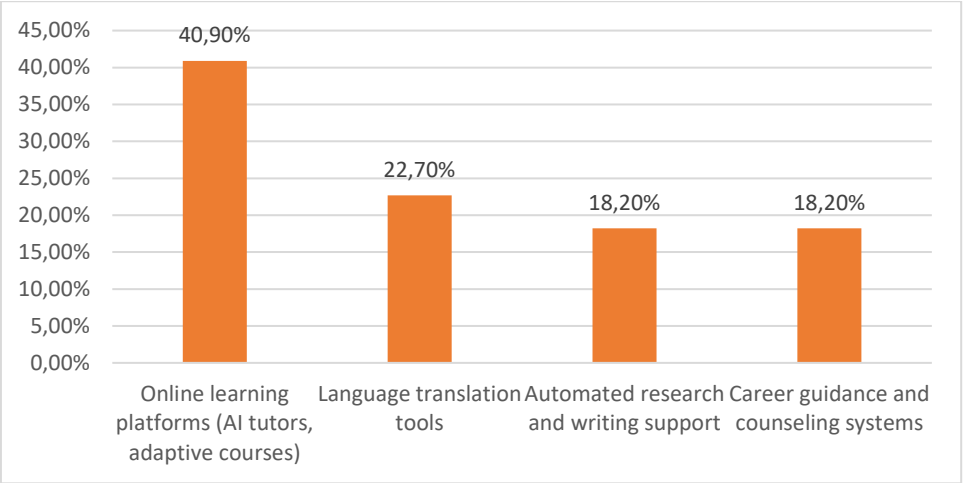


Figure 2. Respondents' Preferences for AI-Based Educational Support for Afghan Women

Figure 2 illustrates respondents' views on the most useful AI-based educational support for Afghan women. Among the 110 participants, the majority (40.9%) favored *online learning platforms* such as AI tutors and adaptive courses. This preference reflects the urgent need for accessible and flexible education solutions in Afghanistan, where many women face restrictions in attending traditional classrooms. AI-driven platforms provide opportunities for personalized learning and self-paced study, making them particularly relevant in overcoming both geographical and social barriers.

Language translation tools were selected by 22.7% of respondents, highlighting the importance of multilingual support in a country with diverse languages and limited English proficiency. This choice demonstrates how AI can bridge language gaps and make international educational resources more accessible. Meanwhile, 18.2% of participants valued *automated research and writing support*, indicating that academic productivity tools are also seen as valuable, particularly for university students engaged in scholarly work. Similarly, 18.2% chose *career guidance and counseling systems*, reflecting the growing interest in AI's role in connecting education with employment pathways.

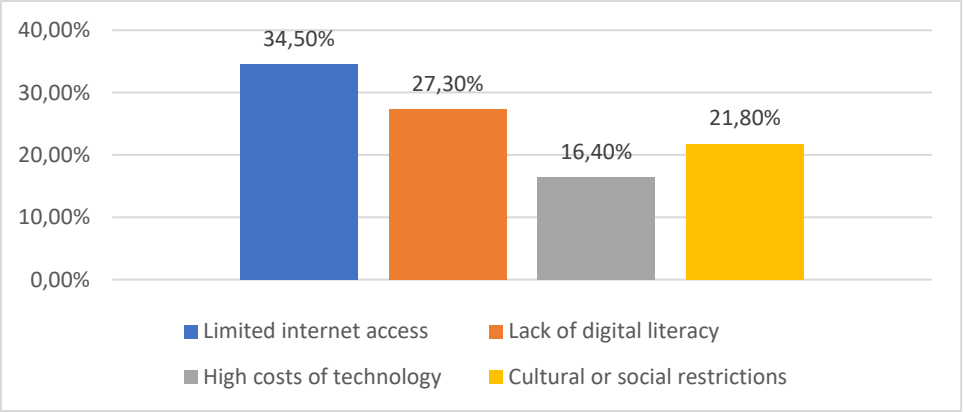


Figure 3. Challenges Faced by Afghan Women in Using AI-Based Educational or Employment Platforms

Figure 3 presents the main challenges identified by Afghan women in utilizing AI-based educational and employment platforms. The most frequently cited barrier was *limited internet access* (34.5%), which reflects the infrastructural difficulties prevalent across Afghanistan. Without reliable connectivity, women are unable to benefit from AI-driven tools such as online learning platforms or digital job portals.

The second most common challenge, reported by 27.3% of respondents, was a *lack of digital literacy*. This finding highlights the skills gap that continues to prevent many women from fully engaging with modern technologies. Despite the availability of AI systems, without adequate training in their use, Afghan women may struggle to navigate or maximize these platforms effectively.

Cultural or social restrictions were identified by 21.8% of participants, emphasizing the influence of traditional norms and family or community pressures that often limit women's access to technology. Lastly, *high costs of technology* were noted by 16.4% of respondents, demonstrating the economic burden associated with purchasing devices or accessing paid platforms.

These results indicate that both infrastructural barriers (internet and affordability) and socio-cultural limitations (skills and restrictions) collectively shape Afghan women's ability to benefit from AI-based educational and employment opportunities.

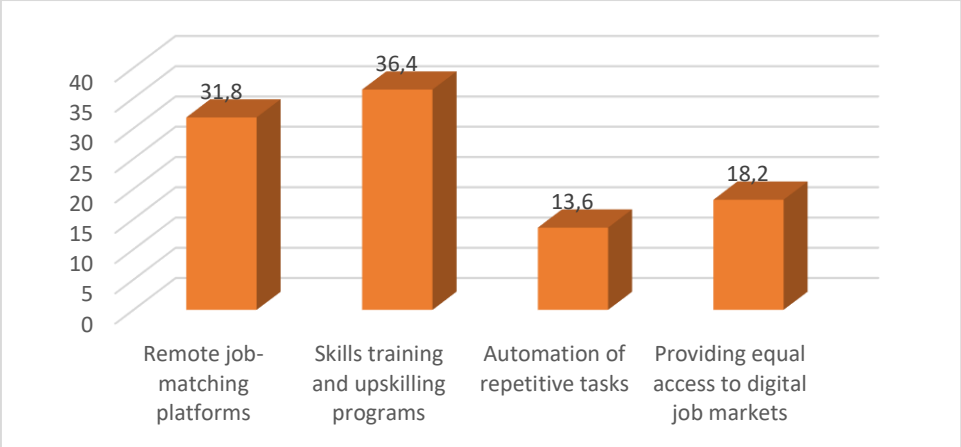


Figure 4. AI-Based Employment Support Preferences for Afghan Women

Figure 4 summarizes the perceptions of 110 Afghan women regarding how AI could support employment opportunities. The majority of respondents (36.4%) identified skills training and upskilling programs as the most beneficial AI application. This suggests that enhancing digital competencies and professional skills is considered critical for improving employability in a context where traditional access to education and vocational training may be limited. Remote job-matching platforms were the second most preferred option, chosen by 31.8% of respondents. These platforms can bridge geographic and social barriers, allowing women to access employment opportunities without needing to leave their homes, which is particularly relevant in Afghanistan's socio-cultural context. Fewer respondents (18.2%) emphasized the importance of providing equal access to

digital job markets, highlighting the need for policies and technologies that ensure inclusive participation in emerging digital economies. Only 13.6% favored automation of repetitive tasks, indicating that while efficiency gains are appreciated, women are more interested in solutions that directly enhance their skills and market access rather than replace human labor. Overall, the findings highlight that AI interventions focusing on capacity-building and accessible employment platforms are the most impactful strategies for empowering Afghan women in the labor market.

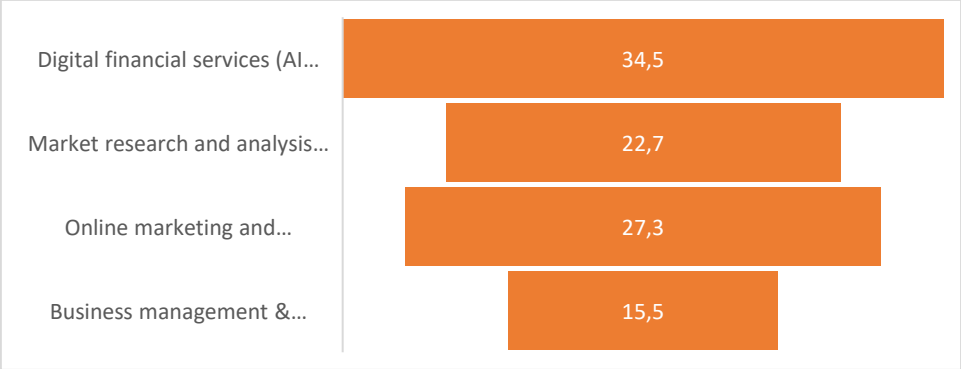


Figure 5. Preferred AI-Powered Tools for Women Entrepreneurs

Figure 5 presents the survey results regarding AI-powered tools that could most benefit women entrepreneurs. A significant portion of respondents (34.5%) prioritized digital financial services, including mobile banking and AI-driven fintech applications. This reflects the critical need for accessible financial tools that enable women to manage capital, secure loans, and conduct secure transactions, particularly in environments where traditional banking access may be limited. The second most preferred category, online marketing and advertising support (27.3%), indicates that women entrepreneurs recognize the importance of visibility and outreach in growing their businesses, as AI can help optimize campaigns and target potential customers effectively. Market research and analysis tools were chosen by 22.7% of respondents, demonstrating the value placed on data-driven decision-making and understanding market trends to gain a competitive edge. Finally, business management and customer service automation was considered beneficial by 15.5% of respondents, reflecting a lower but notable interest in tools that streamline internal operations and enhance service efficiency. Overall, the data highlights that financial empowerment, business visibility, and informed decision-making are the key areas where AI can support women entrepreneurs, aligning technological interventions with practical business needs.

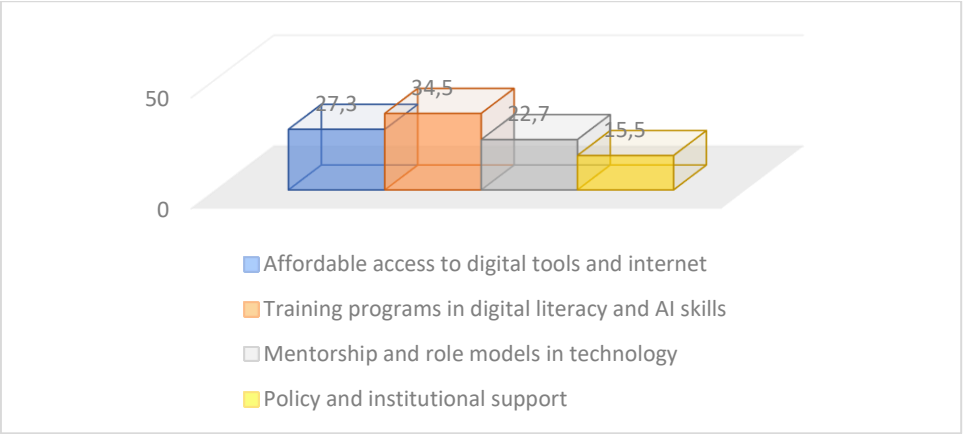


Figure 6. Support Motivating Afghan Women to Adopt AI Technologies

Figure 6 illustrates the types of support that Afghan women perceive as most motivating for adopting AI technologies in studies, careers, or entrepreneurial endeavors. The largest share of respondents (34.5%) emphasized the importance of training programs in digital literacy and AI skills, highlighting that knowledge and practical competencies are crucial enablers for meaningful engagement with AI. Such programs can bridge the skills gap, making women more confident in applying AI tools in diverse professional and academic contexts. Affordable access to digital tools and reliable internet was the second most cited factor (27.3%), indicating that technological infrastructure remains a significant barrier. Without access to devices and connectivity, other interventions may have limited impact. Mentorship and role models were selected by 22.7% of participants, underscoring the value of guidance and inspiration from experienced female leaders in technology, which can encourage sustained participation and career progression. Finally, policy and institutional support was considered motivating by 15.5% of respondents, reflecting the need for frameworks that actively promote inclusion and reduce structural barriers. Overall, the findings suggest that capacity-building through training, combined with accessible technology and supportive networks, is central to empowering Afghan women to leverage AI effectively in their academic and professional pursuits.

DISCUSSION

The findings of this study underscore the transformative potential of artificial intelligence (AI) in advancing education, employment, and entrepreneurship opportunities for Afghan women, while also highlighting significant structural and socio-cultural barriers. In the educational domain, the survey indicates strong optimism toward AI-driven platforms, with 54.5% of respondents rating AI as very important and 27.3% as important in enhancing access to learning opportunities. The preference for online learning platforms (40.9%) suggests that Afghan women value flexible, personalized, and remote education solutions that can circumvent security, cultural, and geographical restrictions (Karimy et al., 2024; Hassani et al., 2025). Language translation tools (22.7%)

and automated research support (18.2%) further indicate a need for AI applications that address linguistic diversity and academic productivity, thereby enabling women to engage more fully with global knowledge resources (Hakimi et al., 2025; Hasanah et al., 2024).

In terms of employment, the data reveals that skills training and upskilling programs (36.4%) are the most desired AI-supported interventions, followed closely by remote job-matching platforms (31.8%). This reflects an acute awareness among Afghan women that developing digital competencies and gaining professional skills are essential for workforce participation in a context marked by limited employment opportunities and gender-specific barriers (Amiri et al., 2024; Nabizada et al., 2024). Although automation of repetitive tasks was less prioritized (13.6%), the preference for skill-focused solutions highlights that women seek empowerment through capability-building rather than substitution, emphasizing AI's role in creating equitable employment pathways.

Regarding entrepreneurship, digital financial services (34.5%) emerged as the most valued AI tool, underscoring the importance of financial accessibility and management in overcoming capital constraints. Online marketing support (27.3%) and market research tools (22.7%) indicate that Afghan women entrepreneurs recognize AI's capacity to enhance market visibility, inform decision-making, and expand business reach (Shaikhzada et al., 2025; Wafeq et al., 2019). Business management and customer service automation (15.5%) was less favored, reflecting a focus on foundational tools that directly impact growth and financial inclusion.

The study also highlights critical factors motivating AI adoption. Training programs in digital literacy and AI skills (34.5%) and affordable access to digital tools and internet (27.3%) were the primary motivators, while mentorship and institutional support also played important roles. These findings confirm that capacity-building, infrastructure accessibility, and supportive networks are essential to ensure meaningful engagement with AI technologies (Hakimi et al., 2024; Afif et al., 2024).

CONCLUSION

This study demonstrates that artificial intelligence (AI) holds significant potential to advance education, employment, and entrepreneurship opportunities for Afghan women, addressing long-standing barriers rooted in socio-cultural, economic, and infrastructural constraints. In education, AI-driven tools such as online learning platforms, adaptive courses, and language translation technologies offer flexible and personalized solutions that can overcome geographic and cultural limitations. These platforms empower women to access knowledge and learning resources, enhancing their academic participation and bridging the educational gap that has historically restricted female engagement in Afghanistan.

In the employment domain, the findings indicate that AI applications focused on skills development and remote job-matching are particularly impactful. By enabling women to gain digital competencies, acquire professional skills, and access job

opportunities remotely, AI helps mitigate the barriers posed by traditional workplace restrictions. These interventions not only improve employability but also enhance women's confidence and readiness to engage in both local and global labor markets.

For entrepreneurship, AI provides tools that facilitate financial management, market analysis, online marketing, and business operations. These technologies enable women entrepreneurs to overcome challenges related to limited capital, restricted networks, and market visibility. By supporting data-driven decision-making and efficient resource management, AI enhances the sustainability and growth potential of women-led businesses.

Overall, the study highlights that while AI presents promising avenues for empowerment, its effectiveness depends on complementary interventions such as digital literacy training, affordable access to technology, mentorship, and institutional support. A holistic approach that combines technological innovation with capacity-building and supportive frameworks is essential to ensure that Afghan women can fully leverage AI. By prioritizing these strategies, AI can serve as a powerful catalyst for social and economic inclusion, fostering gender equity, and promoting sustainable development in Afghanistan.

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