The Impact of Artificial Intelligence on Women's Empowerment in Education in Afghanistan

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Abstract : *Artificial Intelligence (AI) has emerged as a transformative tool with the potential to advance education, empowerment, and entrepreneurship for marginalized populations. This study examines the role of AI technologies in enhancing educational access, social empowerment, and entrepreneurial opportunities for Afghan women, who have historically faced sociopolitical and cultural constraints. Using a quantitative descriptive research design, data were collected from 150 students across four faculties at Vision Online University. Findings reveal that the majority of participants are at least somewhat familiar with AI technologies, with 77% perceiving AI as significantly improving learning opportunities for women. AI is recognized not only as a facilitator of personalized education and digital skills acquisition but also as an enabler of financial independence and entrepreneurial engagement. Participants identified key barriers, including limited access to devices and the internet, low digital literacy, and societal restrictions, which impede effective adoption. The study highlights AI's multidimensional impact in fostering knowledge, autonomy, and economic participation, while emphasizing the need for inclusive implementation strategies. By addressing infrastructural and cultural challenges, AI can serve as a sustainable mechanism for promoting gender equality, social inclusion, and economic development in Afghanistan. These insights underscore the potential of AI to empower Afghan women as active contributors to national progress.*

Keywords: *Artificial Intelligence (AI), Women's Empowerment, Education Access, Digital Entrepreneurship, Afghanistan*

INTROUCION

Artificial intelligence (AI) has emerged as a transformative force with the potential to reshape education, empowerment, and entrepreneurship across the globe. For Afghan women, who have faced decades of social, political, and economic marginalization, AI technology represents not only an innovation but also a tool for liberation and progress. The integration of AI into educational systems can help overcome barriers to access, promote digital literacy, and create new pathways for professional and entrepreneurial development (Ebrahimi et al., 2024; Nesari et al., 2025). As Afghanistan continues to rebuild its social infrastructure, leveraging AI in education is crucial for ensuring inclusivity and sustainable empowerment for women.

Education is a key factor in women's empowerment, and technology plays a critical role in bridging gender gaps in learning. Digital platforms, powered by AI, have made it possible for

Afghan women to access knowledge and skills remotely, despite restrictive sociopolitical conditions (Shaikhzada et al., 2024; Hakimi et al., 2024). Online learning systems enhanced by AI can provide personalized instruction, translation tools, and adaptive assessments tailored to individual learners' needs, enabling women to gain education in safe and culturally sensitive environments (Quraishi et al., 2025). By doing so, AI serves as an equalizer that allows women to participate actively in education and, consequently, in the nation's development.

Beyond education, AI technology offers Afghan women opportunities for social and economic empowerment. Through digital entrepreneurship, AI-based tools support women in creating online businesses, accessing financial platforms, and connecting with global markets (Nabizada et al., 2025; Bashardost et al., 2025). These innovations not only promote financial independence but also challenge traditional gender roles by positioning women as contributors to Afghanistan's growing digital economy (Ebrahimi et al., 2025; Shahbazi et al., 2024). Furthermore, AI applications in entrepreneurship such as business analytics, marketing automation, and digital mentorship enable women to innovate and compete effectively (Abdul Azis et al., 2025; Algur & Mulla, 2025; Tarashtwa et al., 2025a; Tarashtwa et al., 2025b).

Despite its promise, the adoption of AI for women's empowerment in Afghanistan faces challenges related to access, digital literacy, and societal norms. However, studies highlight that when implemented ethically and inclusively, AI can foster social equity and resilience (Samuel et al., 2020; Smart Learning Environments, 2025). Ultimately, the role of AI in advancing education, empowerment, and entrepreneurship among Afghan women lies in its capacity to provide knowledge, autonomy, and opportunities key elements for sustainable development and gender equality in the digital era.

Research Objective

1. To analyze the role of AI technologies in improving educational access and learning outcomes for Afghan women.
2. To investigate how AI-driven tools support the social and economic empowerment of Afghan women through entrepreneurship.
3. To identify challenges and barriers in the adoption of AI technologies by Afghan women and propose strategies for effective implementation.

State of the Art

Artificial intelligence (AI) has increasingly been recognized as a transformative technology with the potential to advance education, empowerment, and entrepreneurship, particularly for marginalized groups such as Afghan women. Access to quality education is a fundamental driver of women's empowerment, and AI-based educational technologies have emerged as vital tools in bridging gender gaps in learning (Nesari et al., 2025; Quraishi et al., 2025). AI-powered learning platforms enable personalized instruction, adaptive assessments, and real-time feedback, which are particularly important in contexts where sociopolitical constraints limit women's physical access to educational institutions (Shaikhzada et al., 2024; Hakimi et al., 2024). Moreover, translation and accessibility tools embedded in AI systems provide culturally sensitive and safe learning environments for women, allowing them to acquire skills that were previously difficult to obtain (Quraishi et al., 2025).

Beyond education, AI has demonstrated considerable potential in fostering social and economic empowerment. Digital entrepreneurship platforms, supported by AI, offer Afghan women opportunities to establish online businesses, engage with global markets, and access financial resources without relying on traditional systems that may restrict their participation (Nabizada et al., 2025; Bashardost et al., 2025). AI tools in entrepreneurship, including business analytics, marketing automation, and virtual mentorship, facilitate decision-making and innovation, enabling women to compete effectively in digital economies (Abdul Azis et al., 2025; Algur & Mulla, 2025). These technological interventions not only promote financial independence but also challenge entrenched gender norms by positioning women as active contributors to national development (Ebrahimi et al., 2025; Shahbazi et al., 2024; Sirat, et al., 2025; nadry et al., 2025).

Despite these advantages, several challenges hinder the effective adoption of AI among Afghan women. Limited digital literacy, inadequate access to technology, and restrictive societal norms remain significant barriers (Samuel et al., 2020; Smart Learning Environments, 2025). Studies emphasize that ethical and inclusive implementation of AI is crucial to prevent further social inequities and ensure that technology serves as a tool for empowerment rather than exclusion (Samuel et al., 2024; Almheiri et al., 2024). Initiatives that combine education, mentorship, and community engagement have been shown to increase women's confidence in using AI and other emerging technologies (Samuel et al., 2020; Quraishi et al., 2025).

Overall, the literature highlights that AI can play a critical role in advancing education, entrepreneurship, and empowerment for Afghan women. By providing accessible learning environments, facilitating digital entrepreneurship, and promoting autonomy, AI represents a key avenue for sustainable development and gender equality in Afghanistan (Ebrahimi et al., 2024; Nesari et al., 2025; Bashardost et al., 2025). However, careful attention to societal, cultural, and infrastructural challenges is necessary to ensure that these technological benefits are equitably distributed.

METHOD
Research Design
This study employed a quantitative descriptive research design to examine the role of Artificial Intelligence (AI) technologies in enhancing education, empowerment, and entrepreneurship among Afghan women. The design was chosen because it allows for the systematic collection and analysis of numerical data, enabling the researcher to identify trends, opinions, and perceptions about AI's impact on women's development. The study focused on understanding students' awareness, experiences, and attitudes toward the use of AI in educational and entrepreneurial contexts.

Population and Sample
The target population of the study consisted of 6,000 students enrolled at Vision Online University. From this population, a sample of 150 students was selected to ensure representativeness across various academic disciplines. The sample included students from four faculties: 50 from Computer Science, 30 from Economics, 30 from Midwifery, and 40 from Nursing. This proportional sampling ensured diversity in academic background and gender representation, reflecting both health-related and non-health-related fields.

Sampling Technique
A stratified random sampling technique was used to select participants. The population was first divided into strata based on faculty, and participants were then randomly chosen from each stratum. This approach minimized sampling bias and ensured that each faculty was adequately represented.

Data Collection Instrument
Data were collected using a structured questionnaire developed by the researcher. The instrument consisted of four multiple-choice questions designed to assess participants' familiarity with AI, perceptions of its impact on education, views on its role in women's empowerment and entrepreneurship, and perceived barriers to its adoption. The questionnaire was distributed electronically through online platforms to ensure accessibility and convenience.

The collected data were analyzed using descriptive statistics, including frequencies and percentages. The results were presented in tables for clarity and ease of interpretation. Each table was accompanied by a narrative explanation to describe the distribution of responses and highlight key findings.

Ethical Considerations
Ethical principles such as voluntary participation, confidentiality, and informed consent were strictly observed. Participants were informed about the purpose of the study and assured that their responses would remain anonymous and used solely for academic purposes.

RESULTS
The target population of this study consisted of students enrolled at Vision Online University, with a total population size of approximately 6,000 students. From this population, a sample of 150

students was selected to participate in the study. The sample was distributed proportionally across four faculties to ensure representation from different academic disciplines.

This sampling strategy ensured that the perspectives of students from both health-related and non-health-related programs were included. The diverse composition of the sample allows for a balanced analysis of responses across academic disciplines within the university.
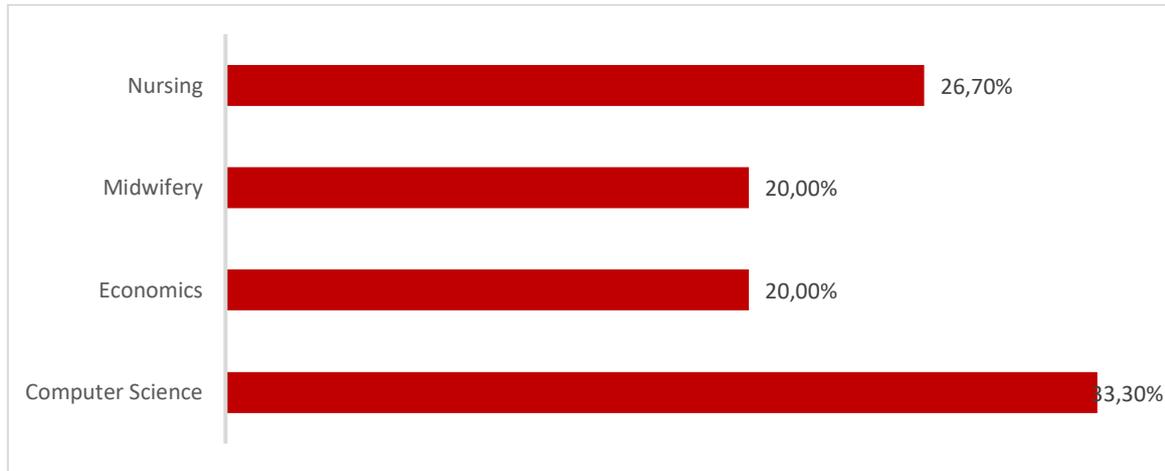

**Figure 1.** Distribution of Participants by Faculty
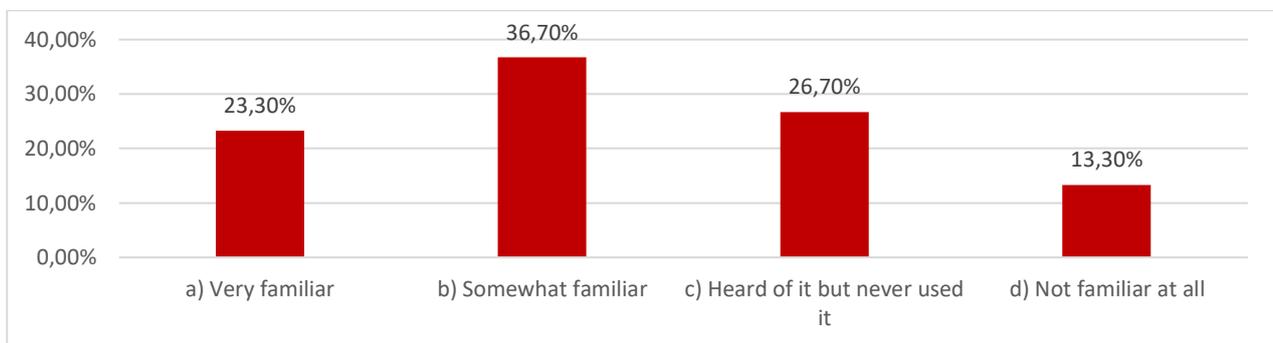
Figure 2. Familiarity with AI Technologies in Education

The findings in Figure 2 indicate that most respondents (36.7%) were somewhat familiar with AI technologies in education, while 23.3% reported being very familiar. This suggests that although a considerable number of students are aware of AI tools such as chatbots, adaptive learning systems, and translation software, only a smaller portion have engaged deeply with them. Around 26.7% of participants had heard of AI but never used it, and 13.3% were not familiar at all. These results highlight a growing awareness of AI among students, yet they also reveal the need for increased exposure and training in AI-driven learning systems.
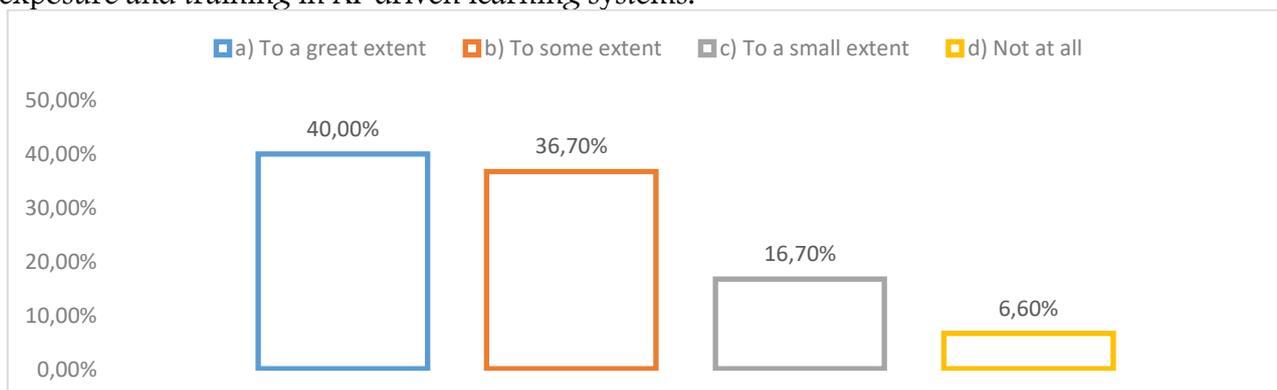

Figure 3. Perceived Impact of AI on Learning Opportunities for Afghan Women

According to Figure 3, 40% of students believed that AI improves learning opportunities for Afghan women to a great extent, while 36.7% said it helps to some extent. This shows a strong positive perception of AI as a transformative educational tool. Only 16.7% believed its impact was small, and a minimal 6.6% saw no benefit at all. The majority of participants recognize AI's potential to enhance educational access, especially for women who face sociocultural restrictions. These responses reflect optimism about the role of AI-based tools in creating more inclusive, flexible, and accessible learning opportunities for Afghan women.
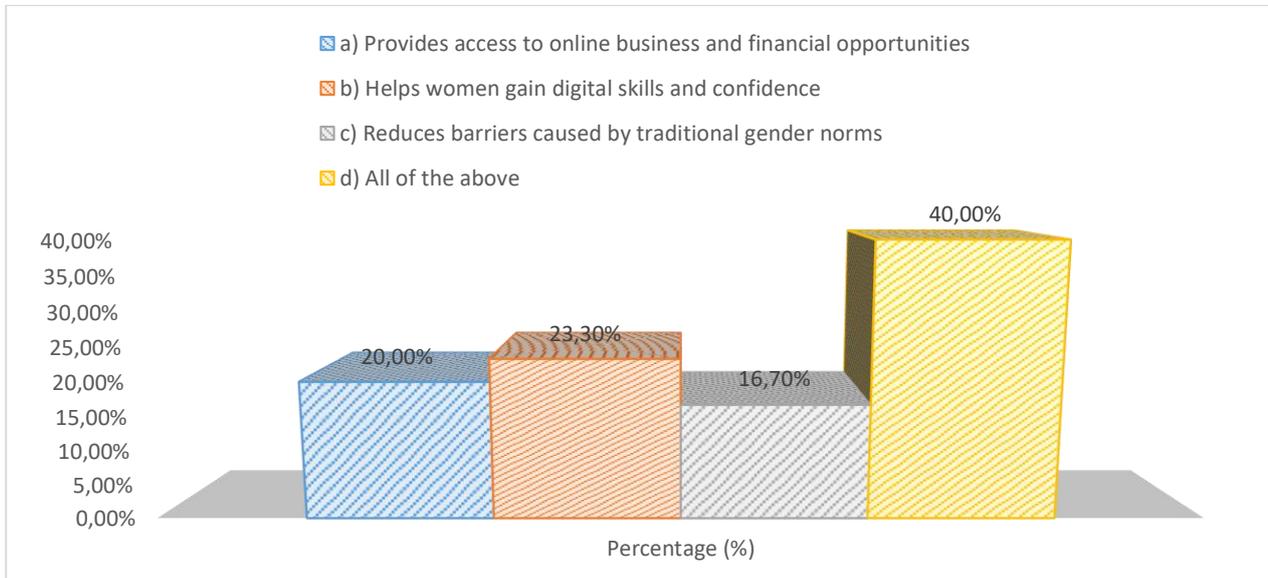
Figure 4. AI's Contribution to Women's Empowerment and Entrepreneurship

Figure 4 shows that 40% of respondents selected "all of the above," suggesting that AI contributes to women's empowerment and entrepreneurship in multiple ways through financial inclusion, digital skills, and social transformation. Meanwhile, 23.3% emphasized skill development and confidence building, while 20% highlighted AI's role in enabling online business access. Only 16.7% identified the reduction of gender barriers as the primary benefit. These results illustrate that students view AI as a multidimensional enabler of empowerment, offering Afghan women new avenues for education, business, and participation in the digital economy, which collectively strengthen their independence and social status.
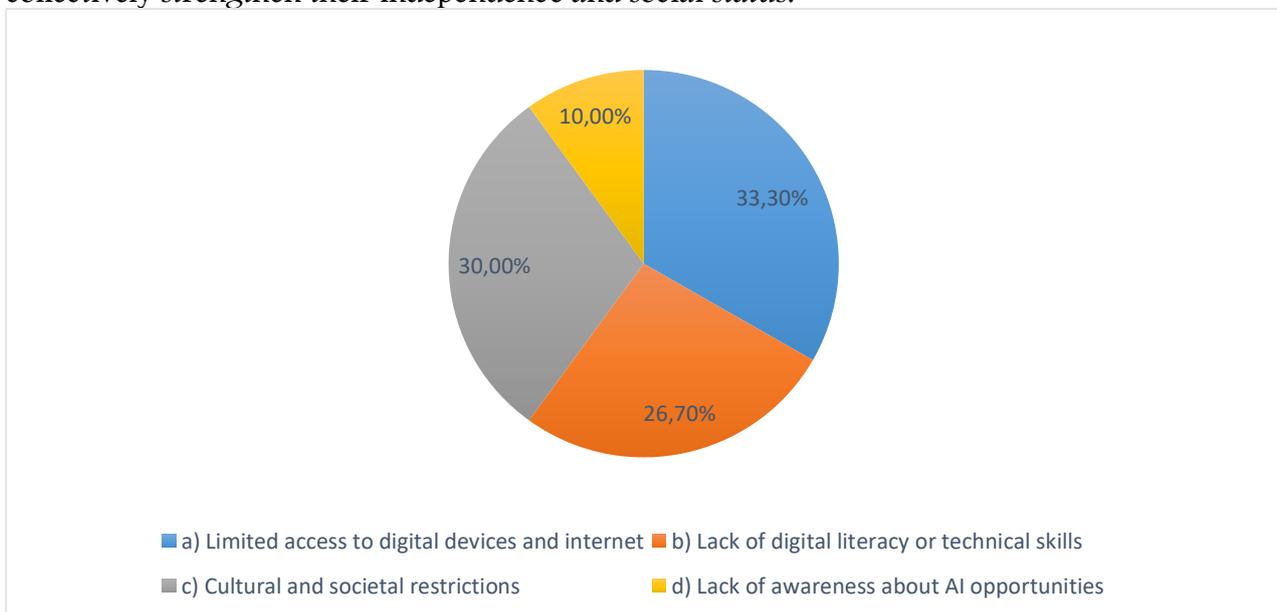
Figure 5. Main Barriers Preventing Afghan Women from Using AI Technologies

As shown in Figure 5, the most significant barrier identified by participants was limited access to digital devices and the internet (33.3%), followed closely by cultural and societal restrictions (30%) and lack of digital literacy (26.7%). Only 10% cited lack of awareness as a major obstacle. These findings suggest that while awareness of AI is increasing, infrastructural and cultural challenges still hinder women's ability to fully engage with technology. The results emphasize the importance of improving digital infrastructure, promoting digital literacy training, and fostering supportive cultural attitudes to ensure Afghan women can effectively benefit from AI technologies.

Table 1. Summary of Key Findings on the Impact of AI on Women's Empowerment in Education in Afghanistan

Aspect	Indicator	Key Finding	Frequency (n)	Percentage (%)	Interpretation
Demographics	Faculty Representation	Computer Science students	50	33.3	Strong representation from technical disciplines
Demographics	Faculty Representation	Nursing students	40	26.7	Significant participation from health sciences
AI Awareness	Familiarity with AI	Very familiar with AI	35	23.3	Indicates advanced exposure to AI tools
AI Awareness	Familiarity with AI	Somewhat familiar with AI	55	36.7	Shows moderate awareness among majority
Education Impact	Learning Opportunities	AI improves learning to a great extent	60	40.0	Strong belief in AI's educational value
Education Impact	Learning Opportunities	AI improves learning to some extent	55	36.7	Confirms overall positive perception
Empowerment	Entrepreneurship & Skills	AI supports empowerment in all aspects	60	40.0	AI viewed as a multidimensional enabler
Empowerment	Skill Development	AI builds digital skills and confidence	35	23.3	Highlights role of AI in capacity building
Barriers	Technology Access	Limited access to devices and internet	50	33.3	Major infrastructural challenge for adoption

Table 1 provides a concise summary of the key findings regarding the impact of Artificial Intelligence on women's empowerment in education in Afghanistan. The demographic data indicate that students from both technical and health-related disciplines actively participated in the study, with Computer Science students forming the largest group (33.3%), followed by Nursing students (26.7%). This diverse academic representation strengthens the reliability of the findings by reflecting perspectives from different fields of study.

In terms of AI awareness, the results show that a considerable proportion of participants are familiar with AI technologies. While 23.3% reported being very familiar with AI, a larger group (36.7%) indicated moderate familiarity. This suggests that AI tools are increasingly recognized among students, though deeper engagement and practical exposure remain necessary.

The perceived educational impact of AI is notably positive. A total of 76.7% of respondents believe that AI improves learning opportunities for Afghan women either to a great or some extent. This reflects strong confidence in AI's ability to enhance access to education, particularly through flexible and personalized learning environments.

Furthermore, the findings highlight AI's role in women's empowerment and entrepreneurship. Many participants viewed AI as a multidimensional enabler that supports skill development, confidence building, and economic participation. However, limited access to digital devices and internet connectivity remains the most significant barrier, underscoring the need for improved infrastructure and inclusive implementation strategies.

DISCUSSION

The results of this study reveal that students at Vision Online University hold generally positive perceptions toward the role of Artificial Intelligence (AI) in advancing education, empowerment, and entrepreneurship for Afghan women. The findings show that a majority of participants were at least somewhat familiar with AI technologies, although many still lacked in-depth engagement. This aligns with Shaikhzada et al. (2024), who found that while awareness of AI is growing in Afghanistan, practical application remains limited due to infrastructural and educational barriers. The data suggest that AI literacy among university students is improving but still requires structured educational initiatives to strengthen digital competence.

Participants overwhelmingly agreed that AI-based educational tools improve learning opportunities for Afghan women. Nearly 77% believed AI positively influences education either to a great or some extent. This supports Nesari et al. (2025) and Quraishi et al. (2025), who emphasize that AI-driven platforms enhance accessibility and personalized learning, particularly for women constrained by sociocultural or geographical limitations. The increasing adoption of online and AI-supported learning environments demonstrates the transformative potential of technology to create inclusive education systems that promote equality and empowerment.

The survey further indicates that students perceive AI as a multidimensional tool for empowerment and entrepreneurship. Respondents believed that AI not only helps women acquire digital skills and confidence but also facilitates access to online business and financial opportunities. This finding aligns with Ebrahimi et al. (2024) and Bashardost et al. (2025), who argue that AI can serve as an economic equalizer by enabling women to participate in digital markets, fostering independence, and challenging traditional gender roles. Similarly, Algur and Mulla (2025) highlight that AI-driven business tools enhance women's innovation and competitiveness in emerging economies.

Despite the optimistic perspectives, significant challenges persist. The most commonly reported barriers were limited access to technology and cultural restrictions, followed by insufficient digital literacy. These constraints mirror the issues identified by Samuel et al. (2020) and Smart Learning Environments (2025), which emphasize that without adequate infrastructure and cultural acceptance, the benefits of AI remain inaccessible to many Afghan women. Addressing these barriers requires coordinated efforts involving policy reform, infrastructure investment, and community-based awareness programs.

Overall, the findings underscore that AI technology holds substantial promise for advancing women's education and empowerment in Afghanistan. However, achieving its full potential demands inclusive strategies that combine technological development with social change, ensuring that AI becomes a sustainable force for equality and innovation.

CONCLUSION

This study explored the role of Artificial Intelligence (AI) in advancing education, empowerment, and entrepreneurship for Afghan women, using data collected from students at Vision Online University. The findings indicate that most participants were aware of AI technologies and recognized their significant impact on improving educational access and learning outcomes. Many respondents viewed AI as a powerful tool that enhances digital learning environments, supports personalized education, and provides opportunities for women who are otherwise restricted by social and cultural barriers.

The results also demonstrate that AI is widely perceived as a driver of women's empowerment and entrepreneurship. Students acknowledged that AI technologies help women develop essential digital skills, gain confidence, and participate in the digital economy through online businesses and

innovative ventures. These insights highlight AI's potential to create new pathways for Afghan women to achieve economic independence and contribute meaningfully to their communities.

However, the study also revealed persistent challenges that limit women's engagement with AI. Limited access to technology, poor internet infrastructure, lack of digital literacy, and deep-rooted cultural restrictions continue to impede progress. Addressing these challenges requires a coordinated approach that includes educational reform, digital inclusion initiatives, and community awareness programs aimed at encouraging the ethical and equitable use of technology.

In conclusion, AI offers Afghan women transformative opportunities to pursue education, empowerment, and entrepreneurship despite the country's ongoing social and economic challenges. By promoting equal access to technology and fostering digital competence, AI can serve as a foundation for sustainable development and gender equality. Continued investment in digital education and inclusive innovation will ensure that Afghan women are not only beneficiaries of technological progress but also active contributors to the nation's future.

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