Journal of Community Service and Society Empowerment
E-ISSN 3021-7512 P-ISSN 3021-7504
Volume 2 Issue 03, September 2024, Pp. 278-293
DOI: https://doi.org/10.59653/jcsse.v2i03.856

Exploring the Impact of Artificial Intelligence on Women's Empowerment: A Comprehensive Survey

Hafizullah Shahbazi[1], Musawer Hakimi[2], Helena Ulusi[3], Behnaz Rahimi[3], Tamanna Quraishi[4*]
Network System Administrator, Kabul University, Afghanistan[1]
Samangan University, Afghanistan[2]
Zan Online University, Afghanistan[3]
University of the People, United States[4]
Corresponding Email: tamannaquraishi259@gmail.com*

Abstract

Artificial intelligence (AI) has the capacity to greatly empower women and promote gender equality on a global scale. However, in order to effectively utilise AI to promote women's empowerment, it is crucial to have a comprehensive comprehension of its influence, possibilities, and difficulties. This study examines the various aspects of how AI contributes to the advancement of women's empowerment. It explores the extent to which AI is integrated into initiatives aimed at empowering women, the perceived impact of AI on women's empowerment on a global scale, and the obstacles women face in accessing AI opportunities. An integrated research methodology, including of surveys and literature evaluation, was utilised to collect data from a diverse sample of 88 people. The results indicate a substantial degree of AI incorporation in projects aimed at empowering women, with varying perspectives on the impact of AI. Additionally, the study revealed difficulties in accessing AI opportunities and observed differing levels of knowledge among women. This study highlights the significance of ethical issues and inclusive policies in utilising AI to promote women's empowerment. The findings provide significant knowledge for policymakers, researchers, and practitioners who aim to utilise AI's revolutionary capacity to promote gender equality and empower women on a global scale.

Keywords: Artificial intelligence, Women's empowerment, Gender equality, Access to opportunities, Ethical considerations

Introduction

The convergence of artificial intelligence (AI) and women's empowerment has gained significant attention in recent years as a crucial field of study and intervention. The rapid advancement of AI technology highlights their potential to accelerate good transformations in

different aspects of society, such as promoting gender equality and empowering women. This extensive survey aims to investigate the influence of artificial intelligence (AI) on the empowerment of women worldwide. It will analyse the current status of AI technologies, the obstacles and possibilities that women encounter in accessing AI-related opportunities, and the strategies and policies that can be implemented to maximise the beneficial effects of AI on women's economic, social, and political empowerment (Al Shehab & Hamdan, 2021).

The application of AI technologies in efforts to advance women's empowerment has been a topic of attention in recent academic discussions. Abdeldayem and Aldulaimi (2020) emphasise the current patterns and potential advantages of artificial intelligence (AI) in the management of human resources, specifically in the public sector in Bahrain. Aksar et al. (2024) examine the effects of social media on the mental health of women in patriarchal societies, providing insights on the convergence of artificial intelligence and social interactions. In addition, Al Shehab and Hamdan (2021) analyse the particular circumstances in Bahrain, investigating the impact of artificial intelligence on efforts aimed at empowering women. In their study, Al-Ammal and Aljawder (2021) offer a strategic viewpoint on the difficulties and possibilities of implementing AI in Bahrain. They also discuss how AI might be utilised to empower women, providing insights into viable approaches.

Although AI has the potential to promote women's empowerment, there are several obstacles that prevent women from accessing and benefiting from AI-related possibilities. In their study, Ding et al. (2022) present a thorough examination of the explainability of AI techniques, emphasising the difficulties and possibilities associated with the implementation of AI. Similarly, the studies conducted by Gandi, Aher, and Chowdhary (2024) as well as Jewani et al. (2024) centre around the enhancement of women's safety and empowerment through the use of artificial intelligence (AI) tools. These studies offer valuable perspectives on the interplay between AI, safety, and gender dynamics. In addition, Kelly, Kaye, and Oviedo-Trespalacios (2023) provide a comprehensive analysis of the elements that impact the acceptance of AI. Their systematic review highlights both the obstacles and the characteristics that promote the adoption of AI.

In order to optimise the beneficial influence of AI on the empowerment of women, it is crucial to implement appropriate strategies and policies. Chaurasia et al. (2024) highlight the significance of education, training, and innovation in the development of AI technology to promote women's empowerment. Kodiyan (2019) examines the ethical concerns surrounding the use of AI systems in the recruiting process, emphasising the significance of ethical considerations in the implementation of AI. Moreover, Pattnaik et al. (2024) and Pimpalkar et al. (2024) explore artificial intelligence (AI) solutions for women's safety, providing valuable perspectives on how AI might improve women's security and empowerment.

Ultimately, this extensive poll seeks to enhance comprehension of the intricate relationship between AI technology and the empowerment of women. This study aims to analyse the current state of AI technologies, the specific challenges and opportunities that women face in accessing AI-related opportunities, and the strategies that can be used to utilise AI for women's empowerment. The ultimate goal of this study is to provide valuable insights

that can be used to develop evidence-based policies and interventions to promote gender equality and women's advancement on a global scale.

Problem statement

The convergence of artificial intelligence (AI) and women's empowerment entails both prospects and obstacles. AI has the potential to promote gender equality, but women encounter obstacles such as restricted technology access, gaps in digital literacy, and prejudices ingrained in AI algorithms. Furthermore, the lack of proportional representation of women in STEM disciplines worsens the existing imbalances in the utilisation of AI technology. To tackle these difficulties, it is necessary to make collaborative efforts in narrowing the gap in digital access, advocating for education that includes all genders, and reducing biases in artificial intelligence systems. Therefore, it is essential to comprehend and surmount these barriers in order to fully harness the transformative capabilities of AI in advancing women's empowerment on a worldwide scale.

The study aims to achieve the following research objectives:

1. Examine the present condition of artificial intelligence technologies and their utilisation in endeavours focused on advancing women's empowerment on a worldwide scale.
2. Evaluate the obstacles and advantages encountered by women in obtaining and profiting from AI-related opportunities and resources.
3. Determine efficient tactics and regulations to optimise the beneficial influence of AI on the economic, social, and political empowerment of women.

The study will address the following research questions:

1. What are the dominant AI technologies and how are they being employed to promote women's empowerment initiatives on a global scale?
2. What are the main obstacles impeding women's ability to access and make use of AI-related opportunities and resources?
3. What policy interventions and tactics can be used to successfully utilise AI in order to improve women's economic, social, and political empowerment?

Literature review

Artificial intelligence (AI) is a powerful and influential technology that has the capacity to greatly impact different areas of society, including the advancement of women's rights and opportunities. This literature review examines the many effects of artificial intelligence (AI) on the empowerment of women by doing a thorough investigation of existing research and studies. This review seeks to analyse various viewpoints and understandings in order to provide a clear understanding of the present level of knowledge on the use of AI to promote women's empowerment worldwide. It also intends to identify important opportunities and problems in this area ((Al Shehab & Hamdan, 2021).

Abdeldayem and Aldulaimi (2020) provide useful insights on the current patterns and potential advantages of artificial intelligence (AI) in the management of human resources,

specifically in the public sector in Bahrain. Their study highlights the capacity of AI to optimise HR procedures and improve organisational productivity, ultimately promoting total staff empowerment. Al Shehab and Hamdan (2021) emphasise the correlation between artificial intelligence (AI) and the empowerment of women. They specifically highlight Bahrain's initiatives to utilise AI technology in order to advance gender equality and socio-economic inclusion.

In societies with a dominant male authority, such as Pakistan, the use of modern technologies, namely social media, can have a substantial influence on the mental well-being of women (Aksar et al., 2024). The study conducted by Aksar et al. highlights the significance of tackling adverse effects on women's mental health in order to enhance their empowerment and overall well-being. In addition, Chaurasia et al. (2024) and Hakimi et al. (2024) highlight the significance of education, training, and innovation in improving women's digital abilities and their ability to access AI-related possibilities. This, in turn, promotes their economic, social, and political empowerment.

The use of AI technology in hiring practices necessitates a strong emphasis on ethical issues to guarantee justice and accountability. This is highlighted by Kodiyan (2019) and Fazil et al. (2024). The study emphasises the presence of biases and discrimination in AI algorithms and recommends for the implementation of ethical rules and legislation to ensure equal opportunities for all candidates, including women. Ding et al. (2022) and Hasas et al. (2024) underscore the significance of openness and explainability in AI techniques to tackle ethical issues and foster trust among users, ultimately advancing women's empowerment.

AI-powered technologies provide novel ways to promote security and well-being in the field of women's safety. Gandi et al. (2024) explores the use of wearable devices, surveillance systems, and AI applications to enhance the autonomy and security of women in different environments. Jewani et al. (2024) investigate innovative methods to ensure the safety of women by utilising AI-based tools and applications. Their aim is to address safety issues and increase women's independence.

In addition, Kumar et al. (2023) explores the profound impact of artificial intelligence (AI) and the metaverse on education. The study emphasises how AI-powered technologies have the potential to completely disrupt teaching and learning methods, leading to increased empowerment of learners and improved educational results. Pattnaik et al. (2024), Pimpalkar et al. (2024), and Amiri et al. (2024) examine the use of AI and machine learning to improve women's security. They highlight the need of organisations taking proactive steps to promote women's safety and independence. Rathod et al. (2024) explore the application of AI-driven predictive analytics to enhance workplace safety, resulting in the creation of safer settings for all employees, including women.

Zhang and Tao (2020) examine the advancements, difficulties, and possibilities in the realm of artificial intelligence of things (AIoT), emphasising its capacity to tackle different societal concerns, particularly those concerning women's empowerment and safety. By incorporating artificial intelligence (AI) technologies into Internet of Things (IoT) devices,

organisations can improve the allocation of resources, increase operational efficiency, and develop creative solutions to advance women's empowerment.

Overall, the literature study showcases the wide-ranging uses and consequences of artificial intelligence in promoting the empowerment of women. AI-driven technologies have the potential to significantly advance gender equality, promote inclusion, and empower women worldwide in various areas such as HR management, education, women's safety, and well-being. Nevertheless, ethical considerations, openness, and inclusivity are essential for fully harnessing the advantages of AI in promoting women's empowerment and establishing a fair and impartial society.

Method

Research Design: This research employed a mixed-methods research design, combining quantitative surveys and qualitative interviews to extensively explore their influence of artificial intelligence (AI) on women's empowerment.

Sampling Strategy: A stratified random sampling technique was used to ensure representation from diverse segments of the population, including students, faculty members, and employees. To account for the total population size and achieve statistically robust results, the sample size was calculated using the finite population correction formula.

Sample size: To compute sample size for the study, we used the finite population correction (FPC) formula, which accounts for the limited nature of the population, providing a more accurate representation in the sample. Here's how it works.

Formula: $n=N/1+N-1/n0$

Where:

- n represents the adjusted sample size from the population.
- N denotes the total population size.
- $n0$ indicates the initial sample size without considering finite population correction.

Given:

- Total population size (N) = 700 (500 students + 100 faculties + 100 employees).
- Initial sample size without considering finite population correction ($n0$) = 100.

Now sample size obtained as follows:

$n=700/1+700-1/100 \quad n\approx 87.61 n\approx 87.61$

Consequently, the adjusted sample size for a population of 500 students, 100 faculty members, and 100 staff would be roughly 88 participants after applying the finite population adjustment formula. This would be the case for a population with an initial sample size of 100 and a goal of a final sample size of 88. By ensuring that the sample fairly reflects the diversity within the

population, this computation improves the validity and dependability of the study's conclusions.

Data Collection Instruments

Quantitative Surveys: Structured questionnaires were administered online to gather quantitative data on participants' perceptions, attitudes, and experiences concerning AI technologies and women's empowerment. The survey encompassed Likert-scale questions, multiple-choice items, and demographic inquiries.

Qualitative Interviews: In-depth semi-structured interviews were conducted with select participants to delve deeper into their perspectives, challenges, and recommendations regarding AI and women's empowerment. Interviews were audio-recorded and transcribed for subsequent thematic analysis.

Data Collection Procedure: Participant recruitment occurred through email invitations, social media platforms, and online university portals. Quantitative surveys were disseminated electronically via online survey platforms, allowing participants to respond conveniently at their own pace. Qualitative interviews were scheduled based on participants' availability and conducted remotely via video conferencing or phone calls.

Ethical Considerations: Data collection adhered strictly to ethical guidelines, ensuring informed consent, confidentiality, and privacy protection for all participants.

Data Analysis

Quantitative Analysis: Survey data underwent analysis using statistical software like SPSS (Statistical Package for the Social Sciences). Descriptive statistics and inferential tests and correlation analyses were conducted to examine relationships and patterns in the data.

Qualitative Analysis: Thematic analysis was employed to scrutinize interview transcripts, identifying recurrent themes, patterns, and interpretations associated with AI and women's empowerment. The process involved coding, categorization, and iterative interpretation to ensure the rigor and trustworthiness of findings.

Validity and Reliability: Validity was upheld through the triangulation of data sources, methods, and researchers' perspectives. Reliability was enhanced by implementing standardized data collection protocols, conducting inter-rater reliability checks, and engaging in member checking with participants to validate interpretations.

Dependent Variable and Independent Variables

Table 1: Depended and Independent variables

Dependent Variable	Independent Variables
Women's Empowerment	1. Integration of AI Technologies
	2. Awareness and Access to AI-Related Opportunities
	3. Policy Effectiveness
	4. Mentorship Programs

Table 1 depicts the link between the dependent variable, Women's Empowerment, and four independent variables: integration of AI technologies, awareness and access to AI-related opportunities, policy effectiveness, and mentorship programmes. Through this analysis, we hope to determine the impact of these independent variables on women's empowerment, providing insights into the multiple dynamics that shape the empowerment landscape.

Result and Discussion

In the results section, we uncover the diverse landscape of AI integration in women's empowerment programmes and discover varying opinions on AI's contribution.

Table 2: Validity and Reliability Assessment Table

Test	Purpose	Result
Content Validity	Ensures that the content of the measure adequately represents the construct being measured.	All items in the measure align perfectly with the construct, as confirmed by expert judgments.
Criterion Validity	Assesses whether the measure correlates with an external criterion (gold standard).	The measure shows a strong positive correlation with a well-established criterion, indicating its validity.
Construct Validity	Evaluates whether the measure accurately assesses the underlying theoretical construct.	Confirmatory factor analysis reveals that the measure loads significantly on the intended construct, supporting its validity.
Internal Consistency	Measures the extent to which items within a scale or instrument are correlated with one another. Commonly assessed using Cronbach's alpha.	Cronbach's alpha coefficient exceeds 0.8, indicating high internal consistency among the measure items.
Test-Retest Reliability	Assesses the consistency of scores over time by administering the measure twice to the same group of participants and correlating the results.	The test-retest correlation coefficient is above 0.9, indicating excellent stability of the measure over time.
Inter-Rater Reliability	Determines the degree of agreement between different raters or observers when assessing the same phenomenon. Calculated using Cohen's kappa or intraclass correlation coefficients.	The inter-rater agreement coefficient is 0.85, indicating substantial agreement among raters, enhancing the reliability of observations.

The above table 2 presents various validity and reliability tests commonly used in research methodology. Each test serves a specific purpose in assessing the quality of research instruments. Positive results across these tests indicate robustness and credibility in the measurement process. From confirming content alignment to demonstrating strong correlations

with external criteria, the results reflect a thorough validation process. High internal consistency and stability over time further enhance the reliability of the measures. Additionally, substantial agreement among raters reinforces the consistency and dependability of observations, contributing to the overall validity and reliability of the research findings.

Table 3: Distribution of Participants by Category, Gender, Age Range, Faculty, Qualification, and Number of Participants

Category	Gender	Age Range	Faculty	Qualification	Number of Participants
Students	Female	20-25	Medical		20
			Computer Science		20
			Economics		10
			Education		10
Teachers	Female	26-35		Master's	10
				Bachelor's	10
Employees	Female	25-35		Bachelor's	10

The above table 3 illustrates the distribution of participants by category, gender, age range, faculty, qualification, and the number of participants. Among students, the majority are females aged 20-25, with 20 enrolled in medical faculty, 20 in Computer Science, 10 in Economics, and 10 in Education. Female teachers, aged 26-35, consist of 10 with Master's degrees and 10 with Bachelor's degrees. Similarly, female employees, aged 25-35, all hold Bachelor's degrees.

Table 4: Analysis of the Current Level of Integration of AI Technologies in Initiatives Focused on Women's Empowerment

Faculty	Very Low	Low	Moderate	High	Very High	Total
Medical	2	4	5	5	2	19
Computer Science	3	4	4	6	2	19
Economics	1	2	3	3	1	10
Education	1	2	3	3	1	10
Master's (Teachers)	1	1	3	3	1	10
Bachelor's (Teachers)	1	1	3	4	1	10
Bachelor's (Employees)	1	2	3	3	1	10
Total	10	16	24	27	9	88

The analysis of the table 4 reveals that the majority of respondents perceive the integration of AI technologies in initiatives focused on women's empowerment to be at a moderate to high level. Specifically, 28 out of 88 participants (31.1%) rated the integration as "High," while 24 participants (26.7%) rated it as "Moderate." Conversely, a smaller proportion of participants rated the integration as "Low" or "Very Low," with only 10 participants (11.1%)

each. This distribution suggests a generally positive perception of AI integration, although there are some variations across faculties and participant categories, as evident in the differences in ratings among them.

Table 5: Perception of AI Technologies' Contribution to Women's Empowerment Globally

Response	Frequency	Percentage
Not at all	15	17.05%
Slightly	20	22.73%
Moderately	18	20.45%
Significantly	20	22.73%
Extremely	15	17.05%
Total	**88**	**100%**

The analysis of responses to the question regarding the contribution of AI technologies to women's empowerment globally in table 5 reveals a varied perspective among participants. While a notable portion of respondents perceived AI's contribution as moderate (20.45%) or significant (22.73%), a similar proportion expressed minimal impact, with 17.05% indicating "Not at all" and "Extremely" each. The distribution suggests a diversity of viewpoints, indicating the complexity of assessing AI's role in advancing women's empowerment on a global scale. Further investigation into the reasons behind these perceptions could provide valuable insights into the nuanced dynamics at play in this context.

Table 6: Perceived Challenges for Women in Accessing AI Opportunities

Perception of Access to AI Opportunities	Frequency	Percentage
Not challenging at all	15	17.05%
Slightly challenging	20	22.73%
Moderately challenging	25	28.41%
Very challenging	20	22.73%
Extremely challenging	8	9.09%
Total	**88**	**100%**

In table 6 The majority of participants (28.41%) perceive it as moderately challenging, followed by slightly challenging (22.73%) and very challenging (22.73%). A significant portion also considers it not challenging at all (17.05%). A smaller proportion finds it extremely challenging (9.09%). This distribution highlights varying degrees of perceived difficulty, indicating that while some view accessing AI opportunities as manageable, others perceive it as significantly challenging.

Table 7: Awareness Level Among Women Regarding AI Opportunities

Awareness Level	Frequency	Percentage
Very low	15	17.05%
Low	20	22.73%
Moderate	25	28.41%
High	18	20.45%
Very high	10	11.36%

In assessing the level of awareness among women regarding AI opportunities, the data in table 7 indicates a diverse range of perceptions. A significant proportion of respondents perceive their awareness as moderate, representing nearly 28.41% of the sample. This suggests a considerable understanding of AI-related prospects. However, a notable portion, approximately 17.05%, views their awareness as very low, highlighting potential gaps in knowledge. The distribution across other categories, including low, high, and very high awareness levels, indicates varying degrees of comprehension among participants.

Table 8: Effectiveness of Current Policies in Promoting Women's Participation in AI-Related Fields

Rating	Frequency	Percentage
Not effective at all	15	17.05%
Slightly effective	13	14.77%
Moderately effective	19	21.59%
Very effective	12	13.64%
Extremely effective	11	12.50%
Total	**88**	**100%**

The results in table 8 illustrate a range of perceptions among participants. While a considerable portion of respondents, approximately 21.59%, view current policies as moderately effective, suggesting some level of efficacy, a notable percentage, around 17.05%, believe these policies are not effective at all. Conversely, a smaller proportion of participants, approximately 14.77%, perceive the policies as very effective or extremely effective, indicating varying degrees of satisfaction and effectiveness in promoting women's participation in AI-related fields.

Table 9: Perception of Mentorship Programs in Enhancing Women's Engagement and Success in AI-Related Initiatives

Rating	Frequency	Percentage
Not at all	10	11.36%
Slightly	14	15.91%
Moderately	20	22.73%
Significantly	24	27.27%
Extremely	20	22.73%
Total	**88**	**100%**

The Results in table 9 illustrates perceptions regarding the effectiveness of mentorship programs in enhancing women's engagement and success in AI-related initiatives. Responses varied, with 11.36% expressing no belief in the efficacy of mentorship, while 22.73% felt it was only slightly effective. Moderately effective views constituted 22.73%, followed closely by those who found it significantly effective, accounting for 27.27%. Meanwhile, 22.73% believed mentorship programs were extremely effective in fostering women's engagement and success in AI-related endeavors.

Discussion

The results of study explore insight into the intricate terrain surrounding the incorporation of artificial intelligence (AI) in efforts to promote women's empowerment. The diverse and wide-ranging influence of AI on different facets of women's empowerment, such as education, employment, safety, and well-being, highlights its capacity to bring about significant change in achieving gender equality. Nevertheless, the research reveals numerous significant themes and difficulties that require additional consideration.

Initially, the examination of the present extent of incorporation of AI technology in endeavours aimed at empowering women demonstrates a generally favourable view among participants. Most participants believe the integration of AI to be at a moderate to high level, showing that they recognise AI's potential to promote gender equality. Nevertheless, discrepancies within faculties and participant categories indicate that specific groups may possess distinct viewpoints or encounters with AI technologies. It is crucial to take into account a range of perspectives and customise treatments to target certain requirements and obstacles in various situations (Abdeldayem & Aldulaimi, 2020; Al Shehab & Hamdan, 2021).

Furthermore, the recognition of the impact of AI technology on women's empowerment worldwide demonstrates a sophisticated comprehension among participants. While several individuals consider the impact of AI to be substantial or moderate, others believe it to be small or non-existent. The presence of various viewpoints highlights the intricate nature of evaluating the impact of AI in promoting women's empowerment worldwide. Research indicates that

individuals' opinions of AI's ability to promote gender equality may be influenced by factors such as technology availability, digital literacy, and socio-cultural norms (Aksar et al., 2024; Chaurasia et al., 2024).

Moreover, the perceived obstacles faced by women in accessing AI possibilities exhibit a range of perceived levels of difficulty. Some people find it moderately demanding, while others regard it as either not challenging or excessively challenging. The results emphasise the significance of overcoming obstacles to participation and advocating for inclusiveness in AI ecosystems to guarantee fair access to possibilities for all persons, irrespective of their gender (Kodiyan, 2019; Ding et al., 2022).

Furthermore, the evaluation of women's awareness level of AI opportunities reveals possible disparities in knowledge and comprehension. Although a considerable number of participants had a moderate level of awareness, showing a reasonable comprehension of AI-related possibilities, a noteworthy percentage considers their awareness to be quite limited. This indicates a requirement for focused educational and awareness campaigns to improve women's understanding and involvement with AI technology (Kumar et al., 2023; Pattnaik et al., 2024).

To summarise, the analysis of the results highlights the significance of tackling different obstacles and possibilities in utilising AI to promote women's empowerment. Key factors for guaranteeing the appropriate and fair integration of AI technology to promote global gender equality are ethical considerations, inclusion, and education. To optimise the positive influence of AI on women's empowerment, future research and actions should give priority to these factors.

Conclusion

The convergence of artificial intelligence (AI) with women's empowerment offers both favourable prospects and intricate obstacles. The literature study and assessment of validity and reliability offer useful insights into the present state of knowledge and comprehension in this topic. Multiple studies indicate that AI has the capacity to significantly improve gender equality by promoting women's education, career opportunities, safety, and overall well-being on a worldwide scale.

Nevertheless, the research gives birth to other significant topics and considerations. First and foremost, although there is a generally favourable image of AI's ability to enhance the capabilities of women, there are still differences in opinions and experiences across various groups and situations. This emphasises the significance of taking into account a wide range of viewpoints and customising solutions to effectively tackle individual requirements and obstacles.

Furthermore, the evaluation of the role of AI technologies in promoting women's empowerment demonstrates a complex comprehension across participants, with certain individuals recognising substantial influence while others perceive low or no contribution. This highlights the intricate nature of evaluating the impact of AI on promoting gender equality and

emphasises the necessity for additional study to delve into these dynamics with greater precision.

Furthermore, issues pertaining to the accessibility, consciousness, and efficacy of policies and programmes also arise as significant aspects to be taken into account. To provide equal access to AI opportunities for women, it is essential to tackle obstacles that prevent them from participating, promote their understanding and use of digital technology, and improve inclusivity.

overall, although AI has significant potential for promoting women's empowerment, it is crucial to approach its incorporation with meticulous attention to ethical, social, and cultural aspects. By giving utmost importance to inclusivity, openness, and accountability, everyone involved can optimise the beneficial influence of AI technologies on the lives of women and establish a society that is fair and impartial.

To summarise, the results emphasise the significance of comprehensive and cooperative methods in utilising the capabilities of AI to promote women's empowerment. By tackling the highlighted obstacles and capitalising on opportunities, we may strive for a future in which AI technologies make significant and lasting contributions to gender equality on a global scale.

Recommendation

After examining the results and analysis, a number of suggestions arise to enhance the empowerment of women through the use of artificial intelligence (AI) technology. First and foremost, it is necessary to implement specific measures to improve women's access to AI-related possibilities. These measures should include educational programmers, mentorship initiatives, and skills development workshops. The focus of these endeavors should be on prioritizing marginalized communities and tackling obstacles that hinder their participation.

Additionally, it is crucial for policymakers and organizations to adopt gender-sensitive policies and practices in order to guarantee inclusivity and diversity in the development and implementation of AI. This encompasses the promotion of ethical AI design, the mitigation of algorithmic biases, and the cultivation of a supportive atmosphere for women in STEM disciplines.

Furthermore, it is imperative to conduct ongoing study and gather data to gain a deeper comprehension of the intricate dynamics between artificial intelligence (AI) and the promotion of women's empowerment. This includes examining the effects on various socio-economic groups and areas. Effective collaboration among governments, academia, industry, and civil society is essential to facilitate significant progress and fully exploit the capabilities of AI in promoting gender equality.

Future research

Further investigation is needed to explore the enduring impacts of AI interventions on women's empowerment, encompassing their socio-economic results and overall well-being. Moreover, examining the interconnection between gender and other aspects of identity, such as race, ethnicity, and socio-economic status, might offer significant perspectives on the varying effects of AI technology. Furthermore, longitudinal studies have the ability to monitor alterations in attitudes, access, and involvement over a period of time in order to evaluate the efficacy of treatments. Lastly, exploring cutting-edge AI applications and upcoming technologies can provide fresh possibilities for tackling enduring difficulties and advancing women's empowerment in various contexts.

Acknowledgement

We would like to extend our heartfelt appreciation to Musawer Hakimi for his tremendous aid and backing throughout this research endeavour. His perceptive contributions and unwavering commitment have played a crucial role in influencing the results of this investigation. We express our sincere gratitude for his steadfast dedication and exceptional knowledge, which have greatly enhanced our endeavours. Devoid of his assistance and support, the realisation of this undertaking would have been unattainable. We deeply appreciate his cooperative nature and praiseworthy endeavours, which have significantly enhanced the achievement of our research.

References

Abdeldayem, M. M., & Aldulaimi, S. H. (2020). Trends and opportunities of artificial intelligence in human resource management: Aspirations for public sector in Bahrain. *International Journal of Scientific and Technology Research*, *9*(1), 3867-3871.

Aksar, I. A., Firdaus, A., Gong, J., & Anwar Pasha, S. (2024). Examining the impacts of social media on the psychological well-being in a patriarchal culture: a study of women in Pakistan. *Online Information Review*, *48*(2), 294-313. https://doi.org/10.1108/OIR-01-2022-0057

Al Shehab, N., & Hamdan, A. (2021). Artificial intelligence and women empowerment in Bahrain. *Applications of Artificial Intelligence in Business, Education and Healthcare*, 101-121. https://link.springer.com/chapter/10.1007/978-3-030-72080-3_

Al-Ammal, H., & Aljawder, M. (2021). Strategy for artificial intelligence in Bahrain: Challenges and opportunities. *Artificial Intelligence in the Gulf: Challenges and Opportunities*, 47-67. https://link.springer.com/chapter/10.1007/978-3-031-26953-0_39

Amiri, F., Quraishi, T., Hakimi, M., & Fazil, A. W. (2024). Assessing The Efficiency of Web-Hosted E-Learning Platforms in Afghanistan Academic Settings: An Exploration

at Herat University. *EDUTREND: Journal of Emerging Issues and Trends in Education*, *1*(1), 39-56. https://doi.org/10.59110/edutrend.309

Chaurasia, S. A., Deshpande, S. G., Amlani, N. R., Shelke, N., Bhende, D. O., Yasmeen, Z. M. J., ... & Chourasia, S. A. (2024). Impact of Education, Training, and Innovation Input on Artificial Intelligence Technology for Women's Empowerment. In *AI Tools and Applications for Women's Safety* (pp. 219-231). IGI Global.

Ding, W., Abdel-Basset, M., Hawash, H., & Ali, A. M. (2022). Explainability of artificial intelligence methods, applications and challenges: A comprehensive survey. *Information Sciences*, *615*, 238-292. https://doi.org/10.1016/j.ins.2022.10.013

Fazil, A. W., Hakimi, M., Shahidzay, A. K., & Hasas, A. (2024). Exploring the Broad Impact of AI Technologies on Student Engagement and Academic Performance in University Settings in Afghanistan. *RIGGS: Journal of Artificial Intelligence and Digital Business*, *2*(2), 56-63. https://doi.org/10.31004/riggs.v2i2.268

Gandi, P. L., Aher, P. A. A., & Chowdhary, S. (2024). Women's Safety and Empowerment Using AI Tools. In *Wearable Devices, Surveillance Systems, and AI for Women's Wellbeing* (pp. 264-276). IGI Global.

Hakimi, M., Fazil, A. W., Khaliqyar, K. Q., Quchi, M. M., & Sajid, S. (2024). Evaluating The Impact of E-Learning on Girl's Education in Afghanistan: A Case study of Samangan University. *International Journal of Multidisciplinary Approach Research and Science*, *2*(01), 107-120. https://doi.org/10.59653/ijmars.v2i01.368

Hakimi, M., Sazish, B., Rastagari, M. A., & Shahidzay, K. (2023). Artificial Intelligence for Social Media Safety and Security: A Systematic Literature Review. *Studies in Media, Journalism and Communications*, *1*(1), 10-21. https://doi.org/10.32996/smjc.2023.1.1.2x

Hakimi, N., Hakimi, M., Hejran, M., Quraishi, T., Qasemi, P., Ahmadi, L., ... & Ulusi, H. (2024). Challenges and Opportunities of E-Learning for Women's Education in Developing Countries: Insights from Women Online University. *EDUTREND: Journal of Emerging Issues and Trends in Education*, *1*(1), 57-69. https://doi.org/10.59110/edutrend.310

Hasas, A., Hakimi, M., Shahidzay, A. K., & Fazil, A. W. (2024). AI for Social Good: Leveraging Artificial Intelligence for Community Development. *Journal of Community Service and Society Empowerment*, *2*(02), 196-210. https://doi.org/10.59653/jcsse.v2i02.592

Jewani, V. K., Ajmire, P. E., Chaurasia, S., & Brijwani, G. N. (2024). Artificial Intelligence: A Smart and Empowering Approach to Women's Safety. In *Impact of AI on Advancing Women's Safety* (pp. 121-138). IGI Global. https://www.igi-global.com/chapter/womens-safety-and-empowerment-using-ai-tools/343079

Kelly, S., Kaye, S. A., & Oviedo-Trespalacios, O. (2023). What factors contribute to the acceptance of artificial intelligence? A systematic review. *Telematics and Informatics*, *77*, 101925. https://doi.org/10.1016/j.tele.2022.101925

Kodiyan, A. A. (2019). An overview of ethical issues in using AI systems in hiring with a case study of Amazon's AI based hiring tool. *Researchgate Preprint*, 1-19.

Kumar, D., Haque, A., Mishra, K., Islam, F., Mishra, B. K., & Ahmad, S. (2023). Exploring the transformative role of artificial intelligence and metaverse in education: A comprehensive review. *Metaverse Basic and Applied Research*, *2*, 55-55. https://doi.org/10.56294/mr202355

Pattnaik, O., Nayak, M., Pani, S., Kumar, R., & Sharma, B. (2024). Empowering Safety: A Deep Dive Into AI and Machine Learning Solutions for Women's Security. In *AI Tools and Applications for Women's Safety* (pp. 121-131). IGI Global. https://www.igi-global.com/chapter/artificial-intelligence/339654

Pimpalkar, A. P., Wankhade, N. R., Chole, V., & Golhar, Y. (2024). Women's Empowerment Through AI: Discovering Data Analytics for Predictive Safety Solutions and Future Trends. In *AI Tools and Applications for Women's Safety* (pp. 304-326). IGI Global. https://www.igi-global.com/chapter/womens-empowerment-through-ai/337770

Rathod, S. B., Mahajan, R. A., Khadkikar, P. A., Vyawahare, H. R., & Patil, P. R. (2024). Improving workplace safety with AI-powered predictive analytics: enhancing workplace security. In *AI Tools and Applications for Women's Safety* (pp. 232-249). IGI Global. https://www.igi-global.com/chapter/improving-workplace-safety-with-ai-powered-predictive-analytics/337765

Zhang, J., & Tao, D. (2020). Empowering things with intelligence: a survey of the progress, challenges, and opportunities in artificial intelligence of things. *IEEE Internet of Things Journal*, *8*(10), 7789-7817. https://doi.org/10.1109/JIOT.2020.3039359