**SHORT COMMUNICATION**
Volume 3 Issue 1 (2025), E- ISSN 2987-9167
Electrical and Computer Experiences
https://jurnal.tintaemas.id/index.php/jece

# The Impact of Modern Technologies on Women's Empowerment: A Case Study of Online University

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**Abstract**
This study investigates the impact of modern technologies on women's empowerment through online education, focusing on their access to higher education, career advancement, and social engagement. The purpose of the research is to understand how digital tools, including smartphones, e-learning platforms, and social media, facilitate women's participation in education and employment, particularly in developing regions. A total of 110 participants from four academic faculties—Medical, Computer Science, Economics, and Education—were surveyed using a structured questionnaire to assess the effectiveness of these technologies in empowering women. The results indicate that technologies such as online learning platforms, mobile devices, and social networking tools have positively influenced women's educational opportunities and career development. However, barriers such as limited access to digital resources, socio-cultural restrictions, and inadequate digital literacy were also identified as challenges. The findings suggest that online education, when accessible and well-implemented, significantly contributes to women's social empowerment and participation in digital economies. Despite these positive outcomes, there is a need for targeted interventions to address the existing technological and socio-cultural barriers, ensuring that more women can benefit from the opportunities provided by modern technologies. In conclusion, while the integration of digital tools has shown promising potential for empowering women, further efforts are required to overcome persistent challenges and fully unlock the transformative power of technology in advancing gender equality.

**Keywords:** Women's Empowerment, Online Education, Modern Technologies, Digital Literacy, Socio-Cultural Barriers.

**Article Info:**
Accepted: 15/2/2025 | Approve: 16/03/2025 | Published: 17/03/2025

## INTRODUCTION

Technological advancements have played a transformative role in various sectors, particularly in the domain of women's empowerment. With the advent of modern technologies, women have gained unprecedented access to education, financial resources, and employment opportunities, leading to social and economic development [1]. Online education platforms, such as Women Online University, have emerged as crucial tools for enabling women's participation in higher education, especially in developing countries where traditional barriers often restrict their access to learning [27]. The digital revolution, marked by the proliferation of information and communication technology (ICT), has significantly bridged gender disparities, fostering inclusivity and equity in education and the workforce [7], [16]. The role of ICT in women's empowerment is widely acknowledged, as it provides a means for women to acquire knowledge, enhance skills, and engage in decision-making processes [12]. The integration of digital learning tools and e-governance initiatives has further amplified women's involvement in various socio-economic activities [18], [23]. Studies indicate that technology-driven interventions have enabled women to access remote learning programs, thereby eliminating geographical and socio-cultural barriers [3], [6]. These innovations not only enhance women's employability but also empower them to contribute effectively to economic growth and societal development [2], [8].

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https://doi.org/10.59535/jece.v3i1.462

A crucial aspect of technological empowerment lies in its ability to create an inclusive learning environment. E-learning platforms, mobile learning (m-learning), and artificial intelligence (AI)-driven educational tools have revolutionized access to higher education for women [10], [21]. The deployment of AI in online education has personalized learning experiences, catering to diverse needs and learning styles [22]. Moreover, blockchain technology has been explored as a means to ensure secure and transparent certification of online courses, further bolstering credibility and accessibility [17]. Furthermore, the intersection of clean energy, sustainability, and technology has influenced women's roles in addressing global challenges [4]. By leveraging digital tools, women have been able to participate in sustainable development initiatives and entrepreneurship ventures, thereby fostering financial independence [5], [9]. The role of ICT in economic empowerment has been particularly evident in South Asian countries, where digital literacy initiatives have significantly improved women's participation in financial and professional domains [17].

Despite these advancements, challenges persist, including limited internet access, gender-based digital divides, and socio-cultural constraints that hinder women's full participation in technological ecosystems [24]. Addressing these issues requires a collaborative approach involving policymakers, educators, and technological stakeholders to create a more inclusive and empowering digital landscape for women worldwide [11], [25]. By embracing technological innovations, women can achieve greater autonomy and actively contribute to societal progress [13], [14]. The integration of modern technologies has significantly contributed to women's empowerment, particularly through online education. Various studies have highlighted the transformative potential of digital platforms in enhancing women's access to education, economic participation, and social mobility [1], [2]. The proliferation of e-learning tools and mobile learning applications has enabled women to overcome geographical and cultural barriers, fostering inclusivity and knowledge acquisition [3], [4]. Online education has provided women with flexible learning opportunities, particularly in developing regions, where access to traditional educational institutions remains limited [5], [6].

Research suggests that information and communication technology (ICT) serves as a catalyst for women's empowerment by facilitating skill development, career advancement, and financial independence [7], [8]. Studies indicate that women leveraging ICT for education experience increased self-efficacy and autonomy, ultimately leading to enhanced socio-economic status [9], [10]. The role of ICT in women's empowerment extends beyond education, as it also contributes to improved participation in decision-making and entrepreneurship [11], [12]. Additionally, the impact of ICT on women’s empowerment in South Asian and Middle Eastern contexts has been widely explored, revealing substantial progress despite existing challenges [13], [14]. Despite the advantages, several barriers persist in the adoption of technology-driven education for women, including inadequate digital literacy, socio-cultural restrictions, and limited access to ICT infrastructure [15], [16].

Studies emphasize the need for tailored interventions to address these challenges, ensuring equitable access to technology-based learning platforms [17], [18]. In Afghanistan, for instance, research highlights the managerial and strategic obstacles to e-learning deployment, underscoring the necessity for policy reforms [19], [20]. Furthermore, the role of artificial intelligence (AI) in enhancing digital learning experiences and its potential for women's empowerment has gained increasing attention in recent studies [21], [22]. Recent explorations into mobile learning technologies and big data integration in higher education suggest promising developments in expanding digital education for women [23], [24]. Research conducted on e-learning initiatives for women in developing countries further validates the effectiveness of online universities in bridging educational gaps [25], [26]. By addressing existing limitations, technology can continue to play a pivotal role in advancing gender equality through education. The primary objective of this research is to analyze the role of modern technologies in enhancing women's access to higher education, particularly through online universities. It aims to assess the challenges and barriers that women face in utilizing digital learning platforms, including technological limitations and socio-cultural constraints.

Furthermore, the study seeks to examine the effectiveness of online education in fostering women's economic and social empowerment, enabling greater workforce participation and digital inclusion. By evaluating these aspects, the research aspires to provide insights into how technology-driven education can bridge gender disparities in learning opportunities. Ultimately, the findings will contribute to the development of inclusive policies and strategies to maximize the impact of online education on women's empowerment.

## METHOD

### Research Design

This study employs a quantitative research design aimed at examining the integration of modern technologies in enhancing women's access to education, empowerment, and employment opportunities. A structured survey was used to collect data from participants, ensuring consistency and reliability of responses.

### Participants

The sample comprised 110 participants selected from four different faculties: Medical, Computer Science, Economics, and Education. The selection was aimed at representing a diverse range of academic backgrounds, ensuring a comprehensive understanding of the subject matter. The demographic distribution of participants is as follows:

1. **Medical Faculty:** 30 participants (Age range: 20-25 years)
2. **Computer Science Faculty:** 30 participants (Age range: 20-25 years)
3. **Economics Faculty:** 30 participants (Age range: 18-24 years)
4. **Education Faculty:** 20 participants (Age range: 20-24 years)

### Sampling Technique

A stratified random sampling technique was used to select participants from each faculty, ensuring equal representation across different academic disciplines. This approach aimed to minimize biases and provide a balanced view of the impact of modern technologies on women from various fields of study.

### Data Collection

Data was collected using a structured questionnaire, which included multiple-choice and Likert-scale questions. The survey was designed to assess the participants' perspectives on the role of modern technologies in education, career development, and socio-economic empowerment. The questionnaire was distributed digitally, allowing for wider reach and ease of participation.

### Data Analysis

The collected data were analyzed using descriptive statistics, including frequency distributions and percentages. The responses were classified into various categories, allowing for the identification of key trends and patterns. This analysis provided insights into the extent to which women perceive the effectiveness of modern technologies in their educational and professional lives.

### Ethical Considerations

The study adhered to ethical guidelines by ensuring voluntary participation and maintaining the confidentiality of respondents. Informed consent was obtained from all participants, and the research was conducted with respect for participants' privacy and rights.

## RESULT AND DISCUSSION

### Result

The results section presents the findings from the survey conducted among 110 participants across four academic faculties. It highlights the impact of modern technologies on women's access to education, career development, and social empowerment.

**Table 1. Demographic Distribution of Participants**

| Faculty | Number of Participants | Age Range |
|---|---|---|
| Medical | 30 | 20-25 |
| Computer Science | 30 | 20-25 |
| Economics | 30 | 18-24 |
| Education | 20 | 20-24 |
| Total | 110 | - |

The study consists of 110 participants from four different faculties. The largest groups are from the Medical, Computer Science, and Economics faculties, each contributing 30 participants, while the Education faculty has 20 participants. The age range of participants varies, with Economics students having a slightly broader range (18-24), while the other faculties fall between 20-25 years. This

distribution ensures a balanced representation of students from different academic backgrounds, allowing for a comprehensive analysis of technological impact across disciplines.

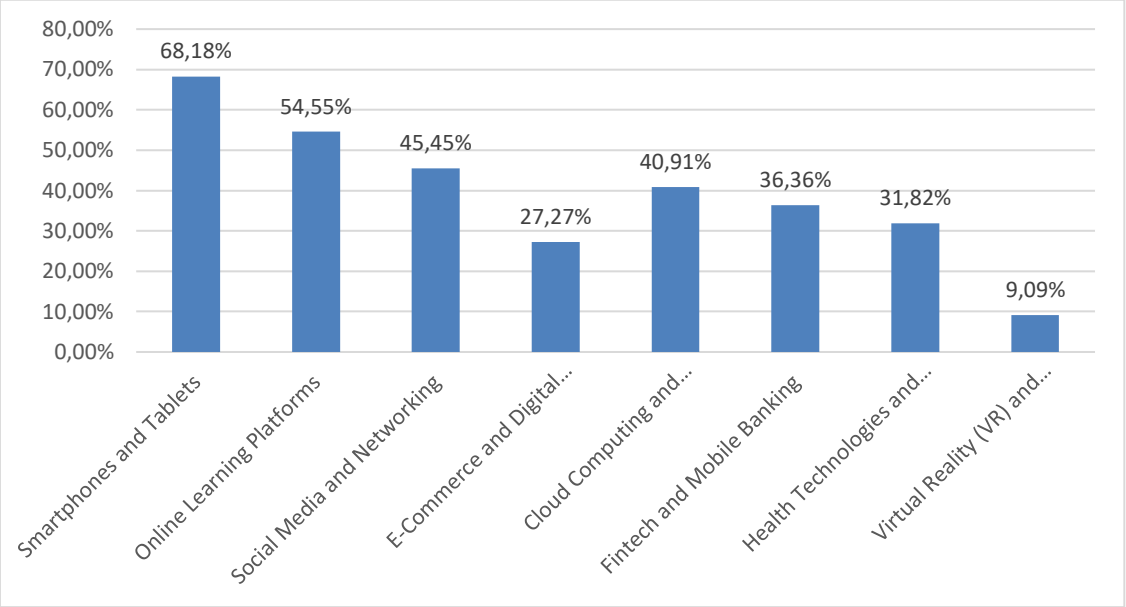


**Figure 1. Modern Technologies Used by Women for Personal Development, Work, or Social Engagement**

The data reveals that smartphones and tablets are the most commonly used technologies among women, with 68.18% of respondents indicating their use for personal development, work, and social engagement. Online learning platforms are also widely used, with 54.55% of women utilizing platforms like Coursera and edX to enhance their skills. Social media and networking platforms (e.g., Facebook, LinkedIn) are used by 45.45%, highlighting their importance in personal expression and professional networking. Cloud computing and collaborative tools, such as Google Workspace and Microsoft Teams, are utilized by 40.91% of women, suggesting their significance in remote work and collaboration. Fintech and mobile banking platforms are also crucial, with 36.36% of respondents leveraging them for financial independence and access to economic opportunities. Health technologies and telemedicine are used by 31.82% of women, reflecting their growing role in managing health and wellness.

Lastly, virtual reality (VR) and augmented reality (AR) are still emerging technologies, with only 9.09% of women utilizing them, indicating that while they hold potential, adoption is still limited. These findings emphasize the broad engagement of women with digital technologies across various aspects of life, yet also highlight areas where further adoption could be fostered, particularly with emerging technologies like VR and AR.

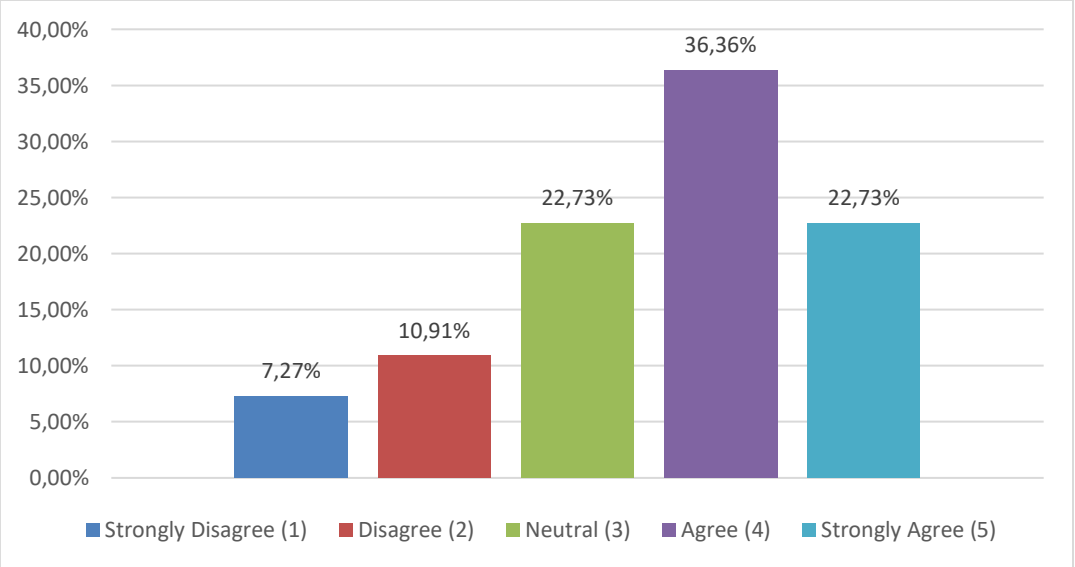


**Figure 2. Participants' Responses on Online Universities Improving Women's Access to Higher Education**

The results indicate that a significant portion of participants (36.36%) agree that online universities have improved women's access to higher education, while 22.73% strongly agree. A neutral stance was taken by 22.73% of respondents, suggesting some participants may perceive both benefits and limitations. However, a smaller percentage of participants disagreed (10.91%) or strongly disagreed (7.27%), indicating that the majority view online universities positively regarding their role in women's education. The overall trend suggests that online education is widely regarded as a beneficial tool for increasing accessibility for women in higher education.

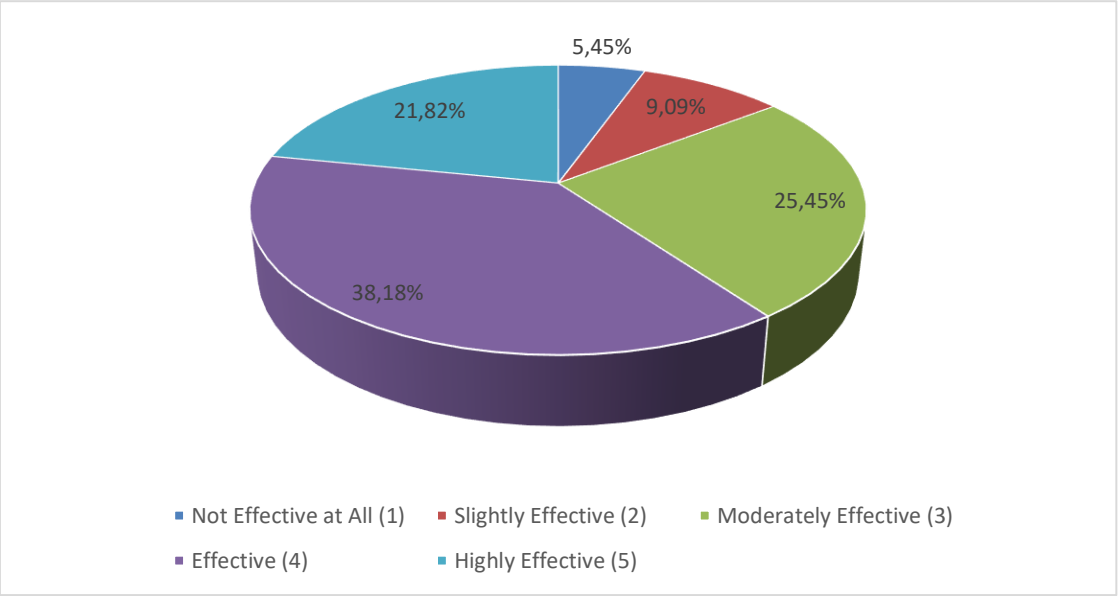


**Figure 3 Participants' Responses on the Effectiveness of Modern Technologies in Enhancing Women's Digital Literacy and Career Development**

The findings reveal that 38.18% of participants believe modern technologies are effective in enhancing women's digital literacy and career development, while 21.82% consider them highly effective. A moderate perception was held by 25.45%, indicating that some participants see benefits but with room for improvement. Meanwhile, 9.09% found these technologies slightly effective, and a small proportion (5.45%) rated them as not effective at all. These results suggest that the majority of respondents recognize the positive role of modern technologies in fostering digital literacy and career growth for women. However, some skepticism remains, highlighting the need for further research into optimizing these technological tools for maximum impact.

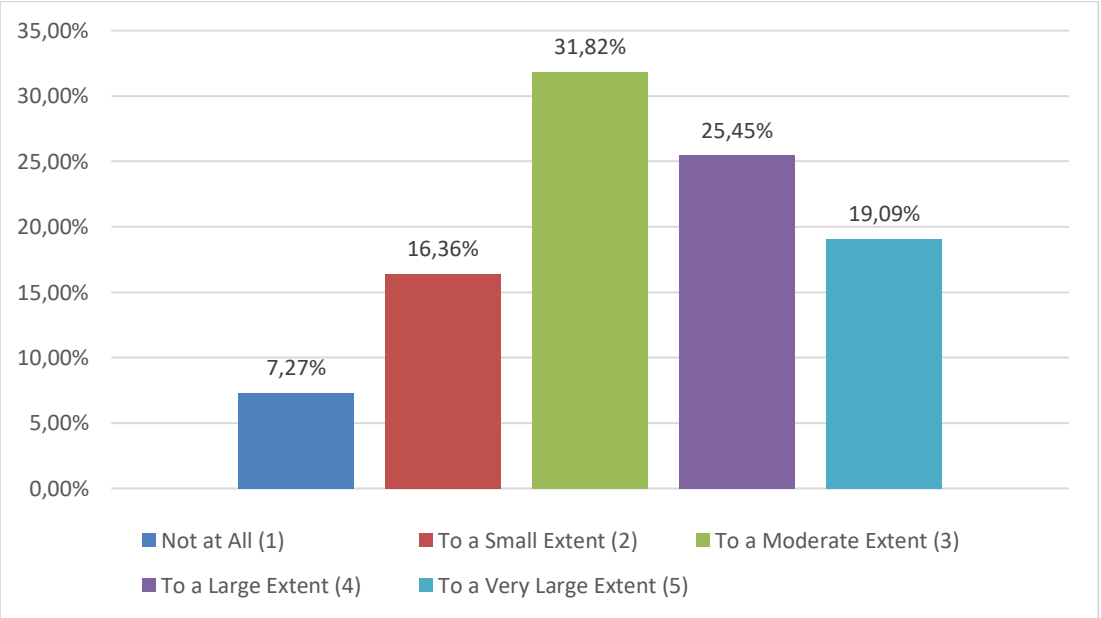


**Figure 4. Technological Challenges Hindering Women's Participation in Online Education**

The results indicate that 31.82% of respondents believe technological challenges hinder women's participation in online education to a moderate extent, showing a significant recognition of barriers. Furthermore, 25.45% feel that these challenges affect participation to a large extent, and 19.09% consider them to have a very large impact, reflecting the substantial influence of factors like poor internet access and lack of digital devices. On the other hand, 7.27% of respondents report no hindrance at all, while 16.36% perceive a small extent of barriers. These findings underscore that technological challenges are indeed a critical issue for many women in accessing online education, and addressing these obstacles could greatly improve their participation and engagement in digital learning environments.

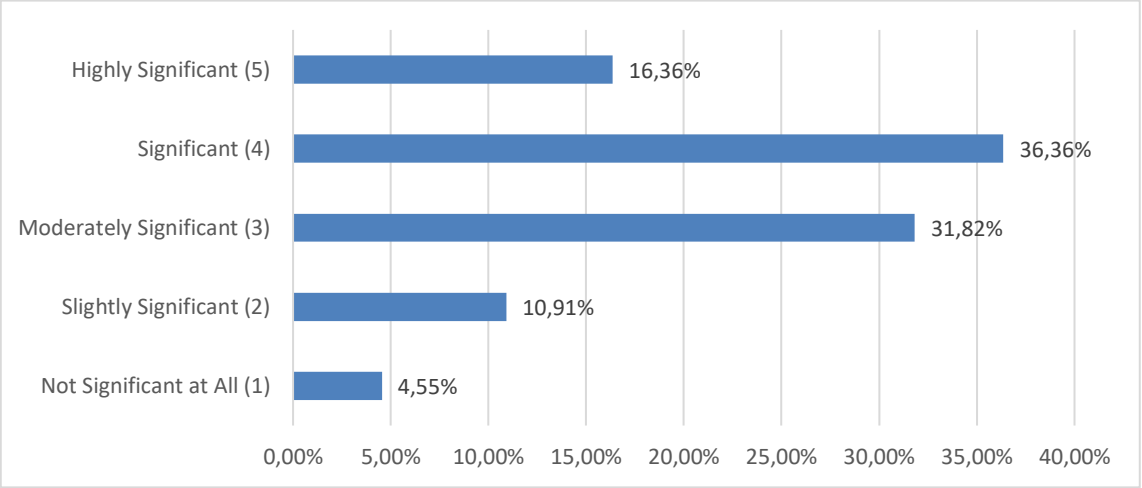


**Figure 5. Socio-Cultural Barriers Limiting Women's Engagement with Modern Educational Technologies**

The data reveals that a substantial proportion of respondents perceive socio-cultural barriers as significant obstacles to women's engagement with modern educational technologies. 36.36% of respondents consider these barriers to be significant, while 16.36% view them as highly significant, indicating a strong belief in the impact of societal factors such as family restrictions and gender biases. Additionally, 31.82% report these barriers to be moderately significant, further emphasizing the widespread recognition of socio-cultural challenges. However, 4.55% of respondents believe these barriers are not significant at all, suggesting that some women may not experience or perceive socio-cultural constraints. Overall, the results indicate that socio-cultural barriers play a considerable role in limiting women's access to modern educational technologies, highlighting the need for cultural and societal changes to empower women in utilizing these resources effectively.

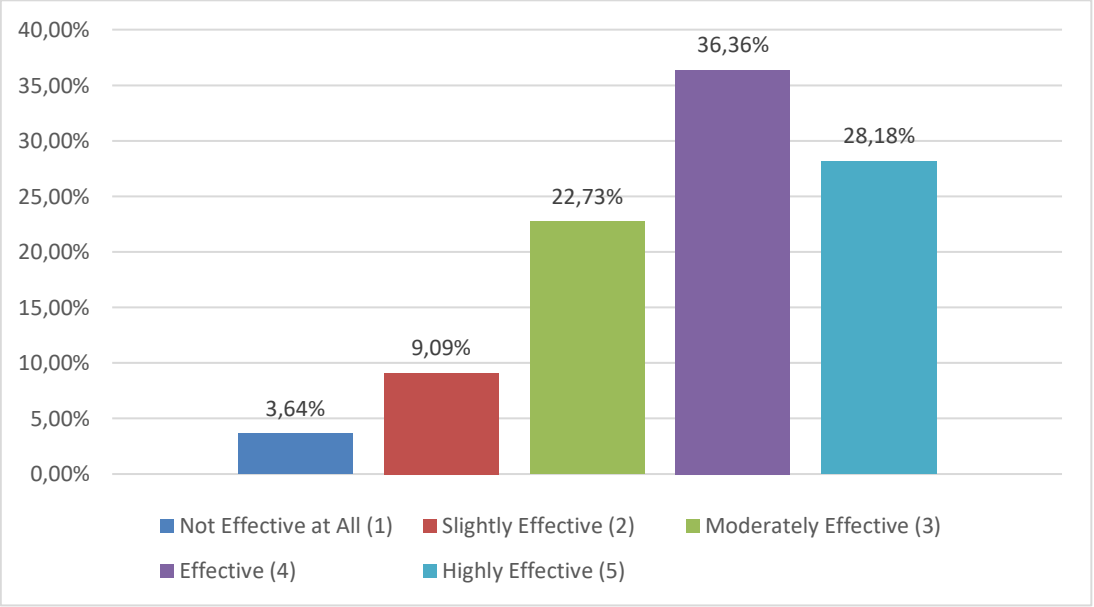


**Figure 6. Effectiveness of Online Learning Platforms in Improving Women's Employment Opportunities**

The responses indicate a strong positive perception of the effectiveness of online learning platforms in improving women's employment opportunities. 36.36% of respondents believe that online platforms are effective, while 28.18% consider them to be highly effective, reflecting a significant confidence in their potential. Additionally, 22.73% of respondents find these platforms to be moderately effective, suggesting that while they see benefits, there may still be room for improvement in their impact. A smaller proportion, 9.09%, regard the platforms as slightly effective, and 3.64% see them as not effective at all. These results suggest that online learning platforms are generally perceived as valuable tools for enhancing women's employment prospects, but further improvements may be needed to maximize their impact.

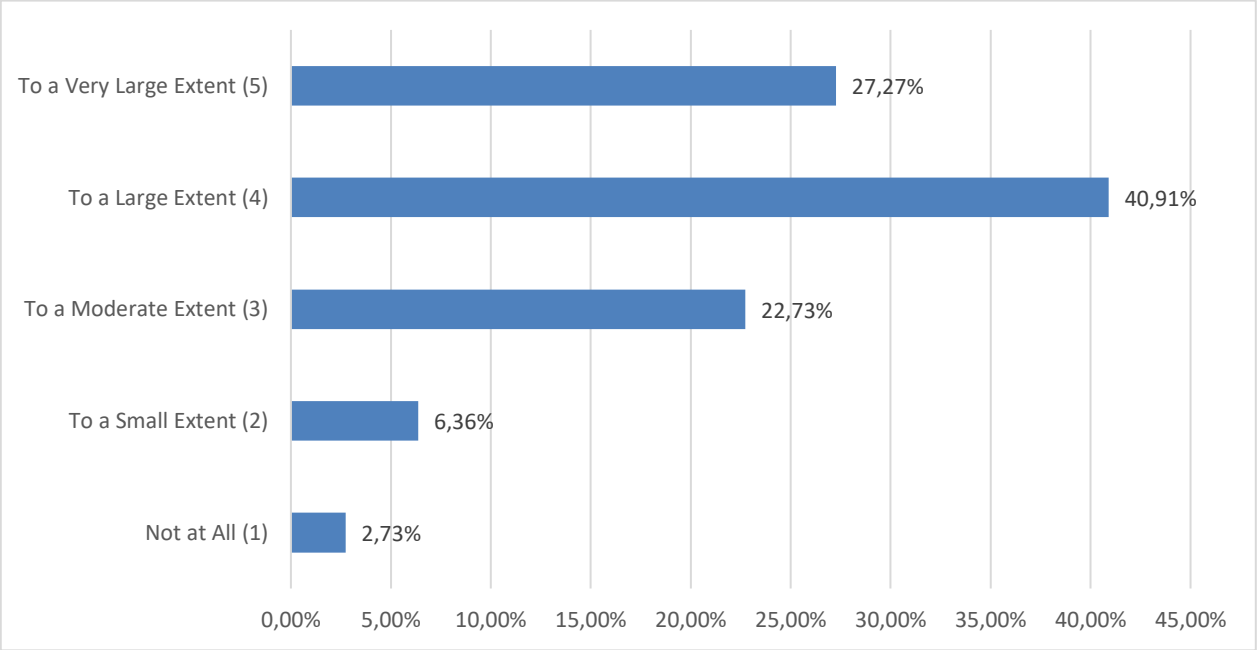


**Figure 7. Contribution of Online Educational Platforms to Women's Social Empowerment and Increased Participation in Digital Economies**

The results suggest that online educational platforms are viewed as a significant contributor to women's social empowerment and their involvement in digital economies. A large portion of respondents, 40.91%, believe that these platforms contribute to empowerment to a large extent, and 27.27% consider the contribution to be very large. This indicates that many women find these platforms to be highly impactful in terms of gaining social and economic benefits. 22.73% view their contribution as moderate, while only 6.36% perceive it to be slightly significant, and a small proportion (2.73%) feel that online platforms do not contribute to social empowerment or digital economy participation at all. Overall, the findings underscore the positive role of online education in empowering women and integrating them more actively into digital economies.

## Discussion

The integration of modern technologies, particularly online education platforms, has had a transformative impact on women's empowerment, offering new opportunities for personal and professional development. Studies have consistently highlighted the role of digital platforms in breaking down traditional barriers that often limit women's access to education and career advancement. In particular, e-learning tools and mobile learning applications have proven effective in enabling women to overcome geographical and cultural limitations, thus fostering inclusivity and knowledge acquisition [1], [2]. For women in developing regions, where traditional educational infrastructures may be scarce or inaccessible, online education presents a flexible and scalable alternative that caters to diverse learning needs [3], [4].

Moreover, the use of information and communication technology (ICT) has emerged as a key catalyst for women's empowerment. Through online platforms, women can acquire essential skills, enhance their digital literacy, and access career opportunities that might otherwise remain unavailable [5], [6]. Research underscores that when women engage with ICT for education, they experience increased self-efficacy and autonomy, leading to greater economic independence and improved socio-

economic status [7], [8]. Additionally, ICT tools not only enhance women's participation in education but also support their involvement in entrepreneurship and decision-making roles [9], [10]. This is particularly evident in South Asian and Middle Eastern regions, where ICT adoption has catalyzed significant progress in women's empowerment despite the socio-cultural challenges they face [11], [12].

However, barriers such as inadequate digital literacy, socio-cultural constraints, and limited access to ICT infrastructure remain significant obstacles. These challenges often hinder women's full participation in technology-driven education [13], [14]. In regions like Afghanistan, for instance, limited internet access and socio-cultural biases further restrict women's engagement with digital learning platforms [15], [16]. The need for targeted interventions, including policy reforms and capacity-building initiatives, is critical to overcoming these barriers and ensuring equitable access to educational technologies for women [17], [18]. Further advancements in artificial intelligence (AI) and mobile learning technologies offer promising opportunities to enhance digital learning experiences for women [19], [20]. AI-powered tools can provide personalized learning experiences, thereby addressing the diverse needs of women learners across various contexts [21], [22]. Additionally, the integration of big data in educational technologies can help tailor learning pathways that support women's career aspirations and socio-economic empowerment [23], [24]. Continued investment in these technologies is essential for narrowing the gender gap in education and enabling women to participate more fully in digital economies [25], [26].

## AUTHOR DECLARATION

**Author contributions and responsibilities -** The authors made major contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.
**Funding -** This research did not receive external funding.
**Availability of data and materials -** All data is available from the author.
**Competing interests -** The authors declare no competing interests.
**Did you use generative AI to write this manuscript? -** We do not use AI assistance in the script.
**Declaration of generative AI and AI-assisted technologies in the writing process -** During the preparation of this work the author did not use AI for writing, editing, or anything else related to the manuscript.

## CONCLUSION

In conclusion, this study highlights the transformative role of online education in empowering women, particularly in developing regions like Afghanistan. Online learning platforms, mobile technologies, and other digital tools provide women with significant opportunities for educational advancement, career development, and financial independence. While these technologies are increasingly recognized for their ability to improve access to education, digital literacy, and workforce participation, significant barriers remain. Challenges such as limited internet access, low digital literacy, and socio-cultural constraints continue to limit the full participation of women in online education. Overcoming these obstacles requires targeted efforts to enhance digital infrastructure, address gender biases, and promote cultural sensitivity in education. Furthermore, the adoption of emerging technologies, including AI and virtual reality, holds immense potential to further enhance the educational experiences and career prospects of women. Ultimately, continued investment in both technological advancements and socio-cultural empowerment will be crucial in achieving long-term gender equality and sustainable development.

Policymakers and educational institutions should focus on expanding access to digital technologies in rural and underserved areas, ensuring that women can fully benefit from online education platforms. Initiatives aimed at enhancing digital literacy, addressing socio-cultural barriers, and promoting gender-sensitive policies will encourage greater participation in digital learning environments for Afghan women. Future research should examine the long-term socio-economic impacts of online education on women, particularly in areas like entrepreneurship and leadership. Additionally, studies should investigate how emerging technologies, such as AI and virtual reality, can further enhance women's educational outcomes and professional development.

**ACKNOWLEDGMENTS**

We would like to thank all the participants for their valuable insights and contributions to this study. Special thanks to the researchers and institutions that provided support and resources throughout the process.

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