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Innovative Education for Global Empowerment: Women and Youth as Catalysts of Transformation in the Digital and Sustainable Era

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Abstract

This study aims to understand the impact of innovative digital literacy education and sustainability Programs on the empowerment of women and youth as catalysts of change both locally and globally. This qualitative study seeks to understand the impact of digital and sustainable education on marginalized communities. This study used semi-structured interviews, focus group discussions, and document review to collect data from 30 digital education and sustainability program practitioners, 15 women, and 15 youth. Thematic analysis was used to the most common issues including digital access, skills development, education on sustainability, participation barriers, and the impact to the community. The results show that participants of digital education improvise their economic status as well as self-confidence and social leadership, while socio-educational participants promote environmental protection and community development. However, issues of gender, finance, and technology access as barriers on digital education were self-identified by the participants. This study adds to the existing discourse on the possible innovative education used to respond to the challenges of the society and promote sustainable development.

Keywords: Digital Literacy Education, Sustainability Programs, Empowerment of Women and Youth, Social Change, Barriers to Participation

Introduction

Empowerment means enabling an individual or group to take charge of their lives, make rational choices, and confront structures of social, political, and economic inequality. This digital age of 21st century has also called forth innovative women and youth empowerment tools particularly within the framework of sustainable development. Empowering women and youth through education has also been recognized as an important instrument of social transformation, economic development, and global leadership (Saxena, 2024; Mumbire, 2025). The deepened digital sustainable education systems enable women and youth to not only bask in the benefits of the newly gained knowledge but to also be change agents in their social, economic, and environmental contexts.

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The Empowerment Outcome of Digital Education

Digital education has emerged as a crucial means of addressing the educational divide in different social and geographical contexts. In the opinion of Aramburuzabala et al. (2024), digital education equips people with the ability to learn from almost anywhere. Specialized e-learning platforms have widened the knowledge chasm and offered educational opportunities to the most disadvantaged segments of society, especially women, children, and the youth of the digitalized developing world. The introduction of digital literacy to the education systems of many of the world's countries is intended to help as many people as possible in attaining social inclusion, especially in countries with limited access to formal systems (Shah & Khan, 2023; Omotosho, 2024). Digital technologies also empower women to partake in economic activities and access opportunities that were previously inaccessible. The barriers to education that women face in rural and developing communities, such as socio-educational, economic, and technological, have traditionally impeded their access to education (Mumbire, 2025). Attaining gender equality in higher education and the employment is one of the proven strategies defined in the digital education framework where the strategies have been effectively developed to overcome these barriers (Aramburuzabala, Culcasi, & Cerrillo, 2024).

Young people have a distinct association with new technologies. In recent times, youth-led innovations have been a major driving force in social entrepreneurship and environmental sustainability (Shah & Khan, 2023). With the help of digital technologies, young people are able to tackle locally focused issues, like climate change, poverty, and healthcare in new and scalable ways. Their engagement with digital innovation promotes sustainability as well as the development of leadership, critical thinking, and problem-solving skills, all of which are essential for enduring self-empowerment (Shah & Khan, 2023; Bastien & Holmarsdottir, 2017).

Education as a Virtue of Sustainable Development

The need for education to help achieve the Sustainable Development Goals (SDGs) cannot be emphatically highlighted as the role of education has become clearer and clearer. As noted by UNESCO (2020), we support and recognize the role of education for sustainable development as an empowering tool for addressing sustainable development challenges. Education is critical for achieving Sustainable Development Goals (SDGs) 5 (gender equality) and 10 (reduced inequalities), both of which directly impact women and the youth. In the context of sustainable development, education as an educator in digital and sustainable forms is perhaps best captured by Saxena (2024) which expresses SDGs and global social equity and structural inequalities face and assist in the resolution of global defence challenges. The use of more feasible, aforementioned sustainable practices has particular relevance to rural women and youth, who disproportionately suffer at the hands of environmental degradation: sustainable agriculture, renewable energy, and climate change mitigation. Access to the Internet through green and sustainability-oriented digital education programs enables 'community green practice' through personal empowerment and social resilience at the grassroots level (Mumbire 2025; Omotosho 2024). These programs also facilitate an increase in the level of youth civic engagement, in that they encourage the younger

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cohorts to become proactive defenders of the environment and sustainable development at the local and international levels (Bastien & Holmarsdottir 2017).

Bridging the Digital Divide: Challenges and Opportunities

The transformational power of digital education continues to be clouded with disparities in the access to the digital world. One of the greatest barriers to digital education is the so-called digital divide. Bouichou, Fadlaoui, and Benbrahim (2024) point out that the promise of educational digitization is a utopia given that a considerable number of women and youths, especially in rural and under exhaustively served regions, are digital tool deserts. Such 'deserts' are the result of a complex interplay of economic, infrastructural, and sociocultural barriers that aim to fence women (and girls) from education and technology access (Saxena, 2024).

The solutions to the above barriers lie in the design and development of education models that are inclusive, and touch on issues of accessibility, affordability and gender. It has to be acknowledged that there are barriers that lie in the very design of digital education programs. Aramburuzabala et al. (2024) point out that such education programs ought to go beyond providing technology to teaching women and youth the tools. It is also important that such collaborative efforts involve the 'implementer' of policies together with the education administrators of the 'bridging the gender gap' policies so that the inequities in access to digital education and innovations is available to every citizen irrespective of gender and socio-economic status (Saxena, 2024).

The Empowerment of Women and Youth through Digital and Sustainable Education

Women and youth emancipation is key in the global world in the quest to achieve sustainable development. This is through their ability to lead change and new initiatives aimed at resolving urgent issues, such as climate change, economic disparity, and social injustice (Mumbire, 2025; Bastien & Holmarsdottir, 2017). Digital education is a vital tool in breaking these barriers as, in most societies, women are at a disadvantage in terms of having economic resources, in decision-making, and social participation (Saxena, 2024).

A similar correlation exists with youth empowerment and digitally sustainable education. They are the leaders of the future; hence, they should be shaped and armed with the requisite skills needed for innovations and sustainability. They play an important role in tackling the issues of the 21st century, especially regarding the application of digital technology to solve the problems of climate change and social inequalities (Shah & Khan, 2023). To attain global empowerment, there is a need to have targeted programs directed towards youth entrepreneurship, leadership, and sustainable development in order to cultivate a new generation of change-maker leaders (Mumbire, 2025; Shah & Khan, 2023).

Review of Literature

The application of digital technologies alongside sustainable methods of education has unlocked new horizons in the global empowerment of women and youth. The women and youth have a

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special importance in the socio-economically unequal and digitally divided world. Change in such structures is embraced by the middle- and lower-class women. Innovative education is a sustainable model that integrates and digitizes education and empowerment. This model has added value to the social transformation in the society. The current literature is focused on the impact of global innovation on women and youth empowerment as well as educators and entrepreneurs of sustainable development in the world.

The Role of Education in Empowering Women and Youth

There is a growing recognition that the distinct domains of the digital economy can be as capital within new and innovative education. According to Saxena (2024), women and youth are empowered through education and training because they are able to achieve independence and self-reliance. Education of this nature is of paramount importance because it seeks to respond to distinct local problems such as sustainability, participation in the economy, and leadership. Also, the digital scarcity model of the economy vis a vis Saxena (2024), there are those who among the populace who construct and/or with the technological gap. The digital divide does remain a challenge given that different regions and social strata have varying accesses to technology. Mumbire (2025) explains that the digital gender gap hinders women's ability to benefit from educational digitalization. In several rural settings, women's access to technology is not only limited, but they are often excluded from participating in digital education. Thus, programs should not only provide technology but incorporate digital gender-responsive inclusive education frameworks that are equitable and sustainable (Mumbire, 2025). In the Sub-Saharan region of Africa, young people have attempted to use digital means to fund renewable energy and sustainable agriculture (Mumbire, 2025). These projects show the young people leadership in the digital as well as the sustainable section which might empower the world even more.

Gender And Digital Divide Education: Barriers to Self Actualization

Closing the digital gender gap is important in the empowering process of women and young people of the particular region. They are pathways to more equitable educational practices. Service-learning projects encourage women and girls to participate in community projects and gain digital skills as well as leadership skills (Aramburuzabala et al. 2024). Such projects are aimed at women with low economic status to empower them with basic digital skills and financial education, as well as self-entrepreneurship, to help them gain economic independence (Akpuokwe & Chikwe, 2024). Finally, Bouichou et al. (2024) take the position argue that having the ability to learn virtually allows women and youth to take on leadership roles in sustainable development. By bridging the digital divide, these programs offer new opportunities for women entrepreneurs, which is vital for driving economic growth and sustainable development at the local level. This is particularly true in rural areas where women-run programs promote sustainable agricultural practices and environmental conservation (Bouichou et al. 2024).

Digital Education Innovation and Sustainability

The ability to create empowering educational frameworks hinges on the nexus between digital change and sustainability. According to Saxena (2024), innovative educational social programs

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that rest on the sustainable development goals (SDGs) are socially sustainable. The digital technology entrepreneurial programs for young people and the SDGs tackle the global systemic problems of climate change, poverty, social inequity, and provide new ways to address the challenges of sustainable development (Saxena, 2024).

Lastly, Omotosho (2024) focuses on the multifaceted technology-enabled entrepreneurship and sustainability fusion education for the empowerment of youths. The Enactus Global Sustainability Initiative is one of such cases which equipped the youths to build socially responsible ventures that solve local problems while also enhancing economic growth and sustainable development (Omotosho, 2024).

Methodology

This study focuses on the role of educational innovation in empowering women and youth as change agents on model in the digital and sustainable world. It investigates the cross section of digital education and sustainable development programs and the empowering processes available to women and youth with respect to digital literacy, entrepreneurship and sustainability. To achieve the study's objectives, a multi-method technique is used which comprises in-depth semi-structured interviews, focus group discussions, and document review.

In the study, a purposive sampling technique was used to identify and recruit participants who have used digital educational tools and/or have attended sustainability programs. The study comprised 30 participants in total, aged 18-35, which included 15 women and 15 youth, all of whom have been engaged in some form of digital literacy and/or sustainable development and entrepreneurship programs. Participants were accessed through a network of community-based organizations, NGOs, and educational providers of digital education and sustainability programs to include both rural and urban participants.

The techniques adopted are semi-structured interviews and focus group discussions. The interviews that are approximately 45-60 minutes long aim to gather digital education experience, barriers to access, and outcomes of empowerment on an individual level. Some focus groups are separated for women and youth, which aim to discuss problems, strategies and perceptions of digital education and empowerment to provide solutions. The interviews and focus group discussions are supplemented by document analysis of educational materials, program curricula, and pertinent policy. This process helps illuminate the findings in relation to participants' experiences and targets of educational programs to provide context.

Thematic analysis by Braun and Clarke (2006) enables 'data user' to split the processes and approach each as a smaller unit, containing level of data to become familiar and, then subsequently, generate codes, search for themes, refine defined themes, and auto-generate a report. Processor NVivo will structure the qualitative data and, subsequently, aid in coding and analysis. Thematic

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analysis offers the flexibility to pivot the focus and explore the presence of impact that influence digital education, community, and especially sustainability.

Analysis

For the purpose of this research, we conducted thematic analyses to extract the key themes that arose from the interviews, focus group sessions, and documents. The study illustrates the themes most frequently and emphatically discussed by the participants and their relevance to the participants' empowerment through digital education and its sustainability.

The data were organized within five overarching themes:

- **Digital Access:** This theme concerns with the extent to which the participants were able to acquire the necessary technological devices, to go online, and to obtain educational materials. This is one of the most discussed themes as it directly obstructs participation in digital education programs.
- **Skill-based Empowerment:** Participants have frequently acknowledged the competencies which they acquired from the digital education programs. This encompassed not only technical attributes such as digital literacy, but also soft skills such as leadership and problem-solving.
- **Sustainability Education:** The theme of sustainability education illustrates the extent to which participants were taught sustainability including environmentally friendly practices, renewable energy, and sustainable agriculture.
- **Participation Barriers:** A considerable number of participants articulated the barriers they encountered when attempting to access digital education, including but not limited to, gender, cultural, and economic barriers.
- **Community Impact:** Participants have frequently emphasized the impact their education had on themselves and their communities, particularly in the areas of sustainability and entrepreneurship.

The figure 1, provided below illustrates the volume of participants' discussions corresponding to each theme. Empowering participants through acquisition of new skills discussions outnumbered others, followed by discussions on the digital access necessary to take part in the education programs. Community impact and Sustainability education also drew attention, while barriers to participation came out of stealth as the most significant hindrance.

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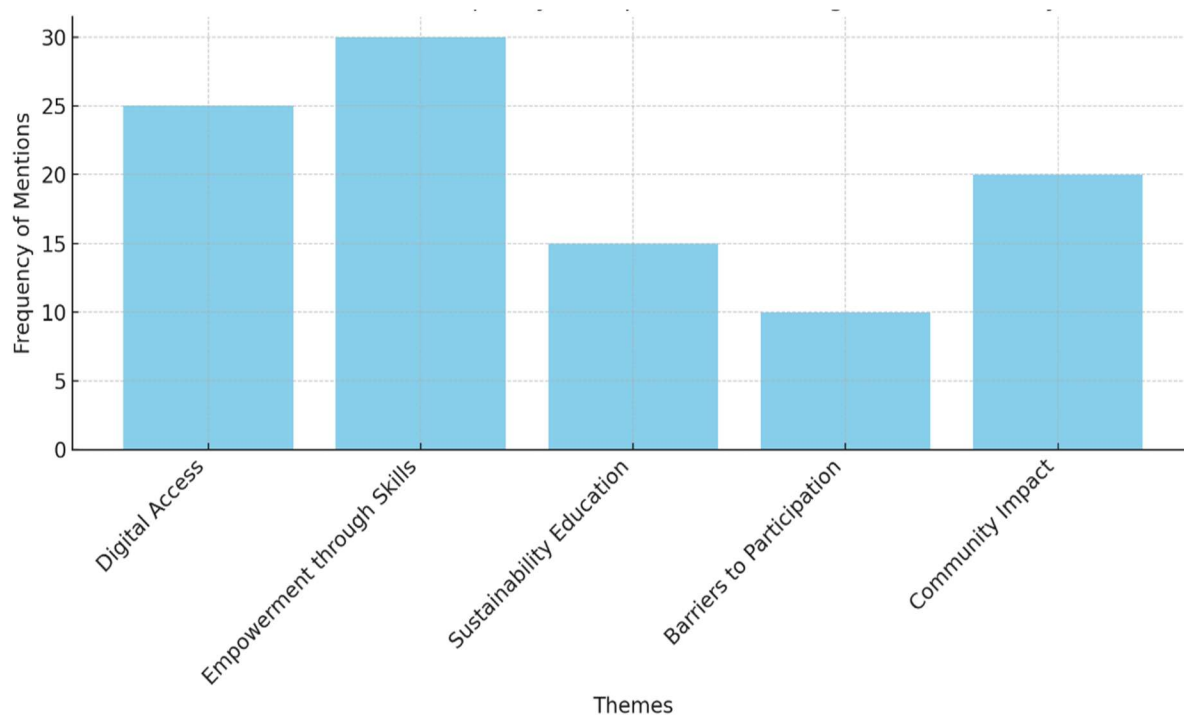


Figure 1: Themes and their frequency in Empowerment through Education Study

Discussions

This study analysed the impact of transformative education focusing on sustainability via digital platforms on the role of women and youths as change agents on the world stage. There was an improvement in the socio-economic and leadership capabilities of the two groups as women and youths were digitally empowered and skilled. Also, the education on sustainability enabled the participants to address global development challenges, and in particular, the social justice and environmental sustainability, to which they were empowered. There still remains the problem of the underutilization of digital transformative education barriers to participation which include, gender norms, socio-economic status, and poor infrastructure.

Digital access and empowerment through skills development

“One type of access that I found important when I ran education programs during the pandemic was access to digital devices and the internet. The ability to access and use computers and the internet and to take part in other online forums and activities was important for empowerment. “This resonates with Mumbire (2025), who attempted to evaluate the consequences of the digital divide on the empowerment of the disempowered. Acquiring devices in the digital age is especially worrisome in the case of women, and more so in the case of women in the hinterlands, as they have a smaller digital divide compared to men, as noted by Saxena in 2024, who asserts that the technology divide is a huge obstacle for women to access the digital education framework. The

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ability to master almost all tools to meet one's needs equally requires the ability to master technology. This has been shown by digital education in providing the youth with entrepreneurial and leadership skills which empowered them to take the initiative and lead community project and social enterprise activities. As Shah and Khan (2023) point out, the youth in the cities use technology to innovate and empower themselves. Moreover, Saxena (2024) explains how digital tools train people to acquire self-decision making and self-confidence skills besides economic self-reliance.

An equally important change was the use of education in coping with and thinking of purposeful innovative solutions towards the problems of the environment. The youth and women participants were able to understand how change-oriented digital education on climate change, renewable energy, and sustainable agriculture could enable them to make a difference in their communities. This has been noticed by Bouichou et al. (2024) who in their work integrated sustainability into educational models from the angle of social activism and responsibility towards the environment. To youth, sustainability education provided tailored avenues for leadership and advocacy. Many participants felt strongly motivated to actively support the adoption of green technologies and eco-friendly practices, which prompted them to take part in local initiatives aimed at environmental protection. In her work, Shah and Khan (2023) argue that youth-led sustainability initiatives are critical to the addressing the Sustainable Development Goals (SDGs). The findings of this study corroborate that claim, showing that youth actively promote environmental sustainability by using digital technologies and education.

Even with the positive impacts of digital education, obstacles to participation still remained as a key issue. Both cultural attitudes and poverty were characterized as challenges to women's participation in digital education. These findings correlate with what Mumbire (2025) reported, which is that women, especially in conservative and rural environments, are disadvantaged with respect to education at a disproportionate rate due to the socio-cultural determinants that place women in a domestic sphere, thereby restricting their access to education and professional employment. In addition, financial issues hindered a number of potential participants from obtaining digital devices or a dependable internet connection. As Saxena (2024) draws attention to, within the context of the gender digital divide, economic disparity tends to worsen the plight of low-income women and digital education. As a result, women's empowerment is significantly stunted. Removing these barriers entails not only the subsidized provision of technology and the internet, but also community mobilization programs that involve men in the advocacy of women's education.

In the last section, participants of the study indicated that the process of digital education that allows the women and also the youths to be empowered, leads to the positive transformation of the community. Many of the participants were able to demonstrate and implement in their communities the skills that they learned from the training, whether it is through business or community advocacy and sustainable development. This is in line with the observation of Bastien

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and Holmarsdottir (2017) in which junior activists and women leaders serve as instruments for the development and change of the community in economic and social aspects. From the data, it appears that the women and youths have the potential to be the change makers in the community, in terms of sustainable development and community resilience.

Conclusion

The study concluded that interdisciplinary education, apart from innovative education, focuses on digital literacy and sustainability as means for women and multi-generational youth empowerment as changemakers in the digital and sustainability age. The transformative potential of educational barriers, such as socio-economic, discrimination, digital divides, and other educational barriers, need highly focused interventions. Women and youth, irrespective of socio-economic status, need gender and socio-economically inclusive programs to educate and empower them to fully engage in sustainable initiatives. Greater focus by policymakers, educators, and the community on removing inequitable barriers to education that empower the marginalized for leadership and global citizenship in sustainability is necessary. The number of mentions for each theme shows, which aspects of participant empowerment were most critical, in relation to the social and economic changes necessary for the acquisition of digital skills and access to them.

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