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Gender Equity in Technology and Innovation: Pathways to Reducing Poverty

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Abstract: Technology and innovation are critical for producing jobs, improving the quality of life, and generating economic growth. Still, gender disparities in access and involvement in these sectors continue to impede growth. Gender equity in technology and innovation is crucial for fostering inclusive economic growth and poverty reduction. In contextualize the findings, the study uses a qualitative research design and a thorough review of secondary sources, including industry reports and policy documents. The study employed secondary data from global databases like the World Bank, ITU, and UNESCO, using thematic analysis to identify trends, patterns, insights, and relationships between gender equity in technology and socio-economic outcomes, evaluating key indicators such as women's representation in leadership roles, access to digital technologies, participation in STEM education, and involvement in the technology workforce. Hence, addressing the intersection of gender equity, technology, and poverty reduction, the study highlights the need for transformative approaches that neutralize structural barriers, encourage inclusive policies, and harness the potential of innovation to achieve sustainable development goals, eventually leading to a more prosperous and equitable society.

Keywords: Economic growth, Gender equity, Innovation, Poverty reduction, Technology.

Introduction

Three decades ago, the development communities joined together to sign the Beijing Declaration and Platform for Action (BDPFA), underlining the relevance of gender equality in efforts to promote development across the world, highlighting sectors for change, and beginning a gender main stream aim (UN, 1995). Rectifying these disparities is not merely a question of social justice; it is an economic need with extensive consequences for poverty alleviation and sustainable development. The topic of technology and innovation has garnered significant attention from researchers, particularly with the onset of the fourth industrial revolution, marked by technical advancements, digital revolution, and the Artificial Intelligence (AI).

In today's society, technology and innovation have emerged as key drivers of growth in the economy, advancement in society, and the reduction of poverty. Mhlanga (2021) asserts that, from the digital economy to clean energy and artificial intelligence, these sectors propel economic development, create jobs, and improve people's quality of life. Despite the obvious benefits of technological innovation, significant disparities exist in how individuals can access and participate in these industries. This gender inequality not only limits women's ability to contribute to and profit from technological advancements, but it also stifles the greater social and economic gains that may be reaped through a more inclusive approach.

With regard to underdeveloped countries, technology provides a rare opportunity to overcome traditional development constraints, overcoming infrastructural deficits via innovation (Matthee & Scheepers, 2023). Nonetheless, the benefits of technological advancement are unequally distributed, with women, particularly in low-income nations, being unfairly deprived of the opportunities it provides. Women's under-representation in technology and innovation is more than just a symptom of larger gender inequality; it represents a missed chance to realize these sectors' full potential for poverty alleviation and economic prosperity. Similarly, according to

Tizikara et al. (2019), increased female engagement in the technological workforce can improve diversity, stimulate innovation, and boost overall productivity, all of which contribute to societal economic prosperity.

Notwithstanding the obvious benefits, major impediments remain to women's participation in technology and innovation. These hurdles are multidimensional, including educational, economic, cultural, and structural elements. At the point of education, girls and young women regularly encounter cultural preconceptions that deter them from studying STEM topics, resulting in a gender imbalance in entering technological careers. Culturally embedded biases and gender norms frequently marginalise women, depicting technology as a male-dominated area and inhibiting women's participation. Economically, women have a more difficult time acquiring funding and resources for tech-based entrepreneurial initiatives, which is exacerbated by gendered perceptions of risk and capacity. Structured working cultures in the technology industry frequently lack gender-sensitive regulations, such as maternity leave or mentorship programs, which might help women succeed in their careers.

Therefore, this study aims to investigate the relationship between gender equity in technology and poverty reduction, specifically how increased participation of women in technology and innovation might act as a driver of socioeconomic transformation and poverty reduction. However, realising this potential necessitates concerted efforts to remove the barriers that prevent women from full participation in these sectors. Policymakers, educators, corporate executives, and civil society organisations all perform a role in promoting gender-inclusive policies and practices that give women equal opportunities in technology and innovation.

Methodology

This study employed a qualitative research approach and heavily relied on a

comprehensive secondary desktop review. It uses a thematic analysis to provide a detailed account of the relationship between gender equity in technology and innovation as pathways to poverty reduction, with a focus on gender gaps in technology and innovation sectors, barriers to achieving gender equity in technology and innovation, and the role of technology and innovation in economic growth, among other things. Documents from journal articles, annual reports, newspapers, and global databases such as UNESCO, World Bank, International Telecommunication Union (ITU), and 0ther similar studies were analysed to articulate the role of gender equity in technology and innovation in terms of improving the economy and the well-being of the general public.

Gender Gaps in Technology and Innovation Sectors

Technology and innovation are dynamic and significant areas in today's ever-changing workforce, affecting companies, economies, and cultures around the world. However, Ottemo (2019) argues that, it has always presented a difficult paradox; on the one hand, it is critical to progress in health, education, agriculture, and well-being, but it is essentially permeated with male dominance, particularly in terms of how men define masculinity through their interactions with and control over technologies. Despite advancements in gender equality in various areas, women remain marginalised in the technology and innovation sector (González-González et al., 2018). This lack of participation not merely presents issues about justice and inclusion, but it also limits the industry's ability to recruit the diverse workforce and perspectives needed for long-term development and advancement.

There is a troubling trend in which technologies are invented at such a rapid rate, with growing intricacy and complexity, that Al-Saqaf and Seidler (2017) adds that society is still behind in understanding their influence, making it late or impossible to construct a renewed social contract that would promote the potential given by technologies while

reducing the bias and conflict they can cause. When it involves gender, this concern is especially pertinent, given the bias against women in technology creation, use, and associated advantages (Ahmed, 2022). According to the International Telecommunication Union (ITU)'s World Telecommunication/ ICT Indicators database, despite progress in lowering the cost of fixed broadband connectivity in Africa since the early 2000s, the cost as a share of gross national income (GNI) per capita in 2021 was as much as 17.7 percent, far exceeding the global average (2.98 percent) and the ITU/UNESCO Broadband Commission for Sustainable Development targets. As a result, the percentage of people utilising the Internet in Africa was the least in the globe at 37.1%, with a digital gap by gender and rural/urban location (ECA et al., 2024).

While more advanced African countries are creating and implementing digital inclusion initiatives, poorer countries are struggling to match the investment needed to create the basic digital infrastructure required. According to Tucker (2024), this contention has persisted, owing to the fact that, in many African societies, traditional gender norms depict technology and related disciplines as male-dominated realms, creating the perception that such areas are improper for women. Women, who make up half of Africa's population, remain considerably under-represented in technology and innovation. This perception is fostered by educational curricula, teaching techniques, and social norms, which frequently fail to challenge such biases (Amaka, 2024). As a result, fewer girls pursue Science, Technology, Engineering, and Mathematics (STEM) courses, restricting their opportunities for professions in technology. According to UNESCO, women make up only 30% of the world's STEM researchers, and the number is significantly lower in Africa (Hammond et al., 2020).

Gender biases regarding technology and innovation, as well as gender structures in its education and labour, have been recognized as some of the most significant impediments to girls' and women's participation in technology and

innovation (Mare, 2021). Despite differences between countries, it is commonly acknowledged in the developed world that gender-based cultures, conventions, and stereotypes influence and constrain people's educational choices in ways that replicate the gender disparity in technology and innovation. The fifth Sustainable Development Goal (SDG) is to promote gender equality and empower all women and girls (ESCAP, 2016). This should begin with the eradication of gender disparities in both primary and secondary schooling. Danjuma et al. (2015) state that, in the developing parts of the world, the gender parity index (GPI) is regarded as girls' school enrollment ratio in relation to boys' enrollment ratio at every level of study, which is in the range of 0.97 to 1.03. In similar vein, Faulkner (2014) identifies this as a heterosexist conversation in which women who are truly interested in engineering are not 'real women,' and conversely, 'real women' are not 'real engineers,' as a message that is constantly reinforced in engineering space. It was put forward that women struggle to integrate 'doing gender' with 'doing technology and innovation' due to societal prejudices that portray women and technology as incompatible. Therefore, some women who are enthusiastic about technology and innovation have embraced gender stereotypes by claiming a resemblance to boys to explain their involvement in technology.

Additionally, there exist an absence of gender-inclusive recruiting processes. Many organizations in the technology sector deliberately perpetuate gender prejudices through recruitment procedures that prefer male candidates (Andrews & Bucher, 2022). For example, job descriptions frequently emphasize characteristics typically associated with men, such as competition or assertiveness, deterring female applicants. Furthermore, Vivek (2023) posits that workplace cultures in the technology industry are frequently male-dominated, resulting in unwelcoming or even hostile situations for women. Even when women enter the technological profession, they face considerable

barriers to career advancement. The absence of mentorship and networking opportunities inhibits their capacity to navigate the market and gain access to positions of leadership (Dunham, 2017). Gender pay discrepancies are also prevalent, with women in technology earning less than males for similar duties. These differences limit women's contributions to the industry and deter them from seeking long-term careers in technology.

It is also important to emphasize that, even when women want to create businesses in the technology industry, access to funds is one of the very essential impediments, with women-led startups earning a disproportionately little amount of venture capital. According to a research by Partech Africa, female-founded firms represented for less than 10% of total investment collected by African technology startups recently (Mkalama & Ouma, 2024). This funding gap is caused by a variety of causes, including investor biases, a lack of collateral, and restricted access to financial networks. Women are frequently seen as higher-risk entrepreneurs, resulting in lower levels of investment in their businesses. Therefore, gender disparities in the technology and innovation sectors constitute not only a social injustice, but also a wasted potential for economic development and poverty alleviation.

The Connection between Gender Equity in Technology and Poverty Reduction

Technology and innovation are widely recognized as engines of economic growth and societal transformation, providing means and potentials to deal with some of the global most critical issues, such as poverty. However, the advantages of technical breakthroughs are not fairly dispersed, and severe gender discrepancies hinder women's participation in this cutting-edge sector (Ceia et al., 2021). At the same time, poverty is a common issue, particularly in countries that are developing where a lot of individuals lack access to basic resources, services, and opportunities. Technology empowers individuals by

allowing them to access, use, and exchange information to gain knowledge, hence reducing poverty through improved education and skill development, employability, economic activity, and labor engagement.

Women are most severely impacted by poverty as a result of structural disparities, limited access to education and employment, and socio-cultural expectations. Kharel (2021) asserts that female poverty is frequently the result of women's poor education, low professional skills and competencies, high illiteracy, and lack of steady income from stable employment. Women in developing nations typically run informal, home-based, and small-scale companies, primarily in traditional sectors that provide relatively poor returns and benefits, impeding a country's social and economic development. For millions of women living in poverty, their lives are a litany of injustice, prejudice, and limitations that hinder them from obtaining their basic requirements of good health, safe childbirth, education, and profession (Neglo et al., 2021).

Women are not particularly well represented as entrepreneurs in both the technology sector and higher-paying male-dominated sectors. For example, Elam et al. (2019) posit that according to an analysis of 59 economies, women entrepreneurs account for 1.7% of the technology industry, compared to 4.9% of male entrepreneurs. In low- and middle-income nations, 17% of women are entrepreneurs, with an additional 35% aspiring to be entrepreneurs. In these respects, the lack of women in technology, particularly in leadership roles, risks exacerbating gender disparities. Ilkkaracan (2024), suggests that Gender-inclusive industrial policies can assist ensure that women continue to have access to these jobs as the demand and supply for them improve. On the demand side, such initiatives would incentivise businesses to hire women or promote women's leadership in the technology sector. On the supply aspect, ensuring women's participation in programmes to improve learning and competencies in sector activities is critical.

According to Ponge (2016), mounting evidence confirms that women's enhanced economic status has numerous economic and welfare benefits for children, families, and society. Solid relationships have also been identified between the usage of technology and growth. Hence, technology and innovation are obviously gender-neutral since women understand the value of innovation and the prospect of these technologies in terms of breaking free from institutionalised discrimination. The ability to advance women economically may be the most exciting transformative characteristic of technology and innovation, as empowering women and improving the efficiency of their work is crucial for alleviating poverty (Kamberidou, 2020).

As societies and economies increasingly integrate digital technologies, rapid implementation and changes in technology utilization generate novel services and products. Digital technologies may significantly enhance female labor-force participation by transforming global trade and consumption patterns, promoting the growth of technology and innovation sectors, and restructuring labour markets to be more flexible, while simultaneously altering the dynamics of labour demand and supply (Petricevic & Teece, 2019). The rapid digitalisation of all procedures and artificial intelligence solutions, modifying the way that various kinds of jobs are done, may greatly contribute to increasing women labour participation in formal economic activities in addition to overall social, economic, and political empowerment of women (Mhlanga, 2021). In this context, efforts to promote gender equality and female economic empowerment become increasingly important in the rapidly evolving technological and socio-economic landscape, not only in developing nations but also in high-income, digitally technologically advanced nations. Globally, Ndlovu et al. (2023) assert that there is an increasing interest in offering valuable and binding proof on the importance of technology in promoting women's economic empowerment; however, technology has been

underutilised in enabling women to pursue economic opportunities.

Hence, it is critical to recognize that gender equity in technology increases women's economic opportunities, allowing them to participate in the digital economy as workers, entrepreneurs, and innovators. For example, digital platforms enable women to access remote work opportunities, overcoming traditional barriers such as geographic isolation or domestic duties. Women-led businesses profit from technological tools that help to streamline operations, boost market reach, and increase efficiency. E-commerce platforms, for example, allow female entrepreneurs to sell their products to a global audience, while digital payment systems ensure secure and convenient transactions. By increasing women's income-generating opportunities, technology contributes to decreasing poverty and improves general economic well-being (Tizikara et al., 2019).

In addition, Treuthart (2019) posits that, technology enables women to magnify their voices, connect with networks, and advocate for their rights. Social media, for example, has emerged as an effective instrument for boosting gender awareness, mobilizing communities, and opposing discriminatory policies. Technology empowers women in homes and communities by expanding their access to knowledge and opportunities. This empowerment has ripple effects on poverty reduction, because women who have a greater influence over resources are more inclined to invest in education, healthcare, and other aspects that increase long-term well-being (Sanders & Scanlon, 2021).

Therefore, focusing on the gender component of technology and innovation is essential not only for avoiding the revolution in technology from negatively impacting gender equality or sustaining current disparities and bias, but also to enhancing women's equal exposure to the advantages provided by information and communication technologies and making sure that they can become a central tool for women's empowerment and gender equality. Programs and policies must ensure that gender variances and

disparities in access to and use of technology are identified and addressed, in order to ensure such technologies actively encourage gender equality and prevent gender-based disadvantages from recurring.

The Role of Technology and Innovation in Economic Growth

As economies evolve, the role of technology and innovation becomes increasingly crucial in driving growth, encouraging competitiveness, and raising living standards. The global economy has undergone substantial shifts due to the quick rate of technological advancements (Sari et al., 2024). Digitalization of national economies is a topical problem in contemporary times because of its importance for structural transformation and sustainable growth. It is a modern process of determining the level of economic development. Challoumis-Κωνσταντίνος Χαλλουμής (2024) argues that significant advancements in digital technologies, as well as the rise of the fourth industrial revolution, are essential drivers of the global quest for a digital economy, with far-reaching implications for nearly all human activity.

Currently, technology and innovation play a significant role in driving globalisation and economic progress, as well as increasing transnational communications and commerce. Not only is it beneficial to the economy, but it has also become an integral part of people's daily lives. Innovation delivers new technologies and new products that assist handle global concerns; novel methods of manufacturing goods and providing services enhance productivity (Tidd & Bessant, 2020). Innovation is the beating heart of the twenty-first century economy, always pouring new, revitalising activity into the system. It is vital for long-term growth and economic development. Several key circumstances promote innovation and economic success. In the modern economy, innovation is vital for value creation, growth, and employment. Innovation processes take place at the enterprise, regional, and national levels (Gerguri & Ramadani, 2010).

Economic growth is most typically

quantified as changes in the total value of goods and services produced by a country's economy, also known as Gross Domestic Product (GDP). All things considered, because countries vary in size, this figure is adjusted for population size, providing a rough estimate of the typical individual's well-being. In the context of developing countries, which have transitioned from agricultural to industrial societies, whose economies do not focus on the use of technology in comparison to developed countries, whose quality of life is lower, the human development index (HDI) and per capita income are relatively low (Hickel, 2020).

Lechman and Paradowski (2021) are of the view that the complete potential of digital technologies can be effortlessly unleashed when they are used as economic development accelerators in least-developed countries, which lack financial resources, good infrastructure, free and easily accessible educational and health services, and a strong government. Unless there is a breakthrough, such as the expansion of information and communication technology, they will most likely continue in poverty, unable to progress. Technology and innovation, which drive telecommunications, are essential factors in contributing value to numerous industrial sectors in both direct and indirect ways. This means that the country's comparative advantage increases as information availability speeds up.

Given the enormous benefits inherent in digital-driven economies, governments around the world are working to create, adopt, integrate, and increase the use of digital technologies. However, African countries seem to be falling behind in this area and are slow to shift to a digital economy. Afolabi (2023) posits that there are considerable gaps in the growth of Africa's digital economy, as seen by the mainly disappointing notable digital economy statistics. For instance, in the year 2022, no African nation holds a position in the world's top 40 nations on the global innovation index (GII), which shows innovation capabilities and outcomes around the world (Daniels et al., 2024).

It is vital to remember that the technology

and innovation sector has been a driving force behind modern economic growth, facilitating connection and enabling the digital economy. In this regard, technological innovation has played a significant role in economic growth, resulting in innovative energy opportunities. Among the good benefits of technical innovation is the diversity of energy sources concurrently and with the same devices, which contributes to pollution reduction (Qamruzzaman & Karim, 2024). In addition to manufacturing similar alternatives from more effective materials at a lower cost and with less pollution, this increases the flexibility of the production system and reduces production expenses. Furthermore, marketing current technology leads to enhanced precision in manufacturing by following to the stated norms and specifications based on principles of science that are not hazardous to the environment (Zhang & Fu, 2022).

In addition, automation and mechanization have revolutionized industries such as manufacturing, agriculture, and logistics. According to Javaid et al. (2021), machines and robotics minimize the need for physical labor, increasing production efficiency and precision. Assembly lines, for example, have significantly cut production times while maintaining uniform quality in car manufacture. Mechanized agricultural equipment, such as tractors and harvesters, has raised crop yields and cut labor costs, helping to food security and rural economic growth. (Emami et al., 2018). Supply chain management innovations, such as blockchain and Internet of Things (IoT), have increased efficiency and transparency. Blockchain ensures safe and foolproof transactions, minimizing fraud and facilitating seamless trade (ThankGod, 2024). IoT devices deliver real-time information about inventory levels, performance of equipment, and transportation logistics, reducing downtime and increasing resource utilization. Sikder and Rolfe (2023) asserts that the existence of E-commerce platforms has transformed retail by linking merchants and buyers beyond

geographical borders. Platforms such as Amazon, Temu, Alibaba, and Shopify give small firms access to global marketplaces, allowing them to scale and compete with larger companies.

In underdeveloped countries, digital platforms enable businesses by lowering entrance barriers and providing marketing, payment, and logistics capabilities. Broadband internet, transportation networks, and energy systems are examples of technological infrastructure that contribute to economic competitiveness. Infrastructure investments accelerate technological adoption, attract foreign investment, and promote industrialization (Gerguri & Ramadani, 2010). China's Belt and Road Initiative, for example, focusses on improving connectivity and infrastructure in order to boost trade and economic cooperation. Another example is Silicon Valley, which serves as a global model for how innovation communities may spur economic growth. The concentration of technological businesses, venture capital, and research institutes has resulted in considerable riches, millions of jobs, and global industry transformations. Silicon Valley's success highlights the importance of fostering innovation-friendly environments through education, investment, and collaboration, as well as the use of technologies such as artificial intelligence (AI), machine learning, and big data analytics to allow businesses to identify trends, optimize resources, and predict consumer behavior with unimaginable precision (Pal et al., 2024). Therefore, it is critical to recognize that technology and innovation are essential to economic progress, providing tools and possibilities to increase productivity, establish new industries, and better access to resources and markets. Economic growth is no longer tied with the possession of natural resources or material potential; rather, it is linked to the use of technology and innovation. As a result, governments should be created with technology and innovation in mind when developing economic strategies and policies. Hence, in today's highly globalized and competitive world economy, a competitiveness plan based

on technology and innovation is the most crucial aspect for countries to not only increase their global competitiveness but also achieve long-term growth.

Barriers to Achieving Gender Equity in Technology and Innovation

Technology has become a driving force behind global progress, affecting economies, cultures, and human lives. However, the benefits and possibilities provided by technology are still unevenly dispersed, notably across gender lines. Despite progress in gender equality, considerable discrepancies remain in access to and participation in technology and innovation. Gender inequalities in society and across all sectors, particularly in the technology and innovation industry, reflect the significant gaps between women and men, which, in turn, lead to uneven development and the feminisation of poverty (Sheidu & Patrick, 2024).

While efforts have been made to solve this issue, there is an urgent need to look into the basic impediments that prohibit women from succeeding in the technology and innovation sectors. The barriers to establishing gender parity in technology are numerous, with socio-cultural, economic, structural, and systemic dimensions. According to Okunade et al. (2023), these barriers impede women's access to education, resources, and opportunities, exacerbating exclusion and perpetuating disparities. These impediments, which are frequently rooted in institutional preconceptions and social standards, emerge at various stages of professional development. Women encounter barriers that impede them from pursuing, excelling, and moving up in technology, from educational institutions to corporate workplaces.

Lower levels of literacy and education are one of the global barriers to women's involvement in the knowledge society. The participation of women and girls declines as one progresses up the educational ladder, especially in STEM (science, technology, engineering, and mathematics) professions (Stoet & Geary, 2018). Traditional gender stereotypes depict technology and STEM

fields as male-dominated. Women and girls are frequently prevented from pursuing careers in technology because society believes these fields are too technical or unsuited for them. Media, school systems, and cultural narratives propagate such preconceptions, resulting in women's lack of confidence and curiosity. In addition, Matthee and Scheepers (2023) posit that in many places, cultural norms limit women's access to technology. Women, for example, may be discouraged from using digital devices or the internet due to moral, privacy, or autonomy issues. These constraints exacerbate the gender digital divide and impede women's capacity to use technology for learning.

The expensive cost of digital gadgets, internet connectivity, and technology-related education frequently puts these resources out of reach for women, especially in households with limited incomes (BANERJEE, 2022). Women are more inclined than men to prioritize family necessities over personal technological investments, which widens the divide. In fact, female entrepreneurs and innovators face enormous barriers to securing capital and investment for technology-driven businesses. Venture capital and finance networks are frequently male-dominated, and innate biases might hinder women seeking financial backing (Riojas, 2023). This financing bias exacerbates gender pay disparities, with occupational segregation limiting women's economic independence and hindering their capacity to invest in technology or pursue careers in the industry.

In the view of Hammond et al. (2020), structural inequities within organizations and industries make attaining gender equity in technology difficult. It is vital to emphasize that women are still under-represented in leadership and decision-making positions in the technology sector. This lack of representation reinforces systemic prejudices and restricts the integration of various viewpoints in technology development and policymaking. Furthermore, technology workplaces sometimes lack flexible work opportunities, such as remote work or parental leave, to satisfy

women's demands (Ndlovu et al., 2023). The lack of such policies disproportionately impacts women, particularly those with caring duties.

Additionally, governments and organizations frequently lack rules that specifically address gender inequality in technology. This includes a lack of programs to encourage STEM education for girls, support female entrepreneurs, and assure equal participation in technological governance. However, a lack of gender-disaggregated statistics on technology access, usage, and participation makes it difficult to detect gaps and plan targeted solutions. Policymakers and stakeholders need reliable data to understand the hurdles and track progress towards gender equity (Eden & Wagstaff, 2020).

It is important to recognize that the challenges to achieving gender parity in technology are multifaceted and firmly founded in sociocultural, economic, structural, and systemic factors. As a result, overcoming these obstacles is critical not only for empowering women, but also for realising the full potential of technology to generate economic and social change.

Inclusive Development Framework through the Lens of Gender and Development (GAD) Theory

The Women in Development approach arose in the latter part of the 1970s and highlighted that women are not marginalised from development, but rather integrated on uneven conditions that reflect and reinforce hierarchical relations between the First and Third Worlds (Benería et al., 2015). It aimed to make women's concerns vital to development by demonstrating the favorable synergies between investing in women and gaining economic advantages. However, in the 1990s, there was a shift in thought and strategy away from "Women in Development" (WID) and towards "Gender and Development" (GAD). The GAD approach primarily represents the distinction between learnt and intrinsic behavior. Danjuma et al. (2015) assert that the concept's usefulness stems in part from its examination of social procedures and initiatives in terms

of their consequences on women, men, and female-male interactions. GAD theory turns the attention away from women alone (as shown in previous Women in Development initiatives) and onto the larger socio-cultural and economic systems that determine gender relations.

Recognizing the intersection of gender inequality with other types of discrimination, such as race, class, ethnicity, and disability, GAD theory emphasizes the importance of addressing numerous, overlapping oppressive systems in development processes. The theory examines how social, cultural, and economic systems maintain gender inequality and provides tools for developing policies and interventions that promote gender equity as a key component of inclusive development. Members of the Development Alternatives with Women for a New Era (DAWN) organization are the most vocal proponents of this method. DAWN was founded during the 1985 Nairobi international NGO forum, an event attended by 15,000 women activists and held concurrently with the official World Conference on Women, asking for an approach to women's development that emphasizes the importance of global and gender imbalances (Stephenson, 2018).

Inclusive development prioritizes equal access to resources, opportunities, and decision-making processes for all members of society, regardless of gender, socioeconomic level, or geographic location. Chandratreya (2025) opines that inclusive development aims to tackle institutional inequalities and foster sustainable growth that benefits everyone. The incorporation of GAD theory into an inclusive development framework, emphasizes the importance of gender-sensitive approaches in creating, executing, and assessing development programs, while tackling structural barriers that perpetuate gender inequality. Through transforming the structures and systems, such as patriarchy, economic policies, and cultural practices that perpetuate gender inequalities, it aims to incorporate gender equity into the development processes. In addition, Okunade et al. (2023) are of the

view that feminist movements' demands for equality in all development and policy processes paved the way for gender mainstreaming. Gender mainstreaming entails incorporating gender equity concerns into all policy, program, and decision-making processes, ultimately leading to a significant transformation.

Therefore, GAD theory views gender as a relational notion, focusing on the dynamics of men's and women's identities within society systems. It calls for examining how power, privilege, and access to resources differ among genders. For example, while education is a key driver of inclusive development, gender inequalities in access to school continue, particularly in low-income and rural communities. Economic empowerment is also an important component of inclusive development. Technology is a tremendous enabler of development, yet gender disparities in access and involvement continue (Matthee & Scheepers, 2023). GAD theory emphasizes the necessity of establishing inclusive and equitable technology ecosystems through community technology hubs, low-cost internet access, and targeted digital training initiatives. It proposes tackling structural impediments to women's labor market and entrepreneurship, as well as regulations that assure equal pay for equal work, salary transparency, and occupational segregation.

The study is organized around key principles of GAD theory and their application in the domains of technology and innovation. This includes designing technologies that address the specific needs of women and marginalized groups, such as ensuring privacy, safety, and accessibility in digital platforms. Thus, an inclusive development framework based on Gender and Development theory offers a revolutionary strategy to resolving structural disparities and supporting equitable growth.

Conclusion

The belief that gender-neutral technology and innovation will benefit a whole population regardless of gender is not anchored in reality, because of the impact

of gender relations on technology and the societal restraints that women experience when using technology (Tucker, 2024). In the event technology and innovation are not inherently patriarchal or unambiguously liberating, but rather a socially shaped crystallization of society, gender and development analysis must pay attention to the economic, social, and political circumstances that influence the development and use of digital technologies, in order to realize the full potential of the technological revolution for gender equality.

This study looked at the essential relationship between gender equity in technology and innovation, as well as its potential to reduce poverty and promote inclusive economic development. The study, which is based on gender and development theory concepts, shows that achieving gender parity in technology is more than just a social or ethical obligation; it is also a strategic accelerator for addressing global poverty and inequality. These gaps come from systemic impediments such as limited access to education and training, unequal access to financial resources, entrenched cultural biases, and a lack of female representation in decision-making positions.

As a result, it is critical to recognize that unless this gender divide is specifically addressed, technology and innovation have the potential to exacerbate existing inequalities between men and women and create new forms of inequality, particularly in developing economies where the digital and economic divides intersect, further marginalizing women and worsening poverty.

Recommendations

The following recommendations are made to ensure that women and girls are fully incorporated into the digital economy, contributing to innovation and economic development while decreasing poverty more effectively.

a. A key recommendation is to enhance STEM education for girls and women. This includes providing gender-neutral textbooks, including technology-focused courses into the curriculum, and creating mentorship programs that connect female

students with role models in the technology and innovation sectors.

b. Governments and international development organizations should collaborate to make digital technology more affordable for women, especially in impoverished areas. This can be accomplished by encouraging private sector participation in sponsoring women-led digital firms through tax breaks or co-investment programs.

c. Governments and organizations need to develop policies. Gender quotas for leadership positions in technology companies are one practical strategy to assure women's equal representation in the industry. These policies should cover hiring procedures, pay equity, and workplace protection for women.

d. Technology companies should consider women's needs and viewpoints while designing and developing products. This includes involving women in the early stages of product creation and conducting gender-sensitive user research.

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