

Cutting Edge Technology as a Sine Qua Non to Gender Equality in Africa: the Role of Education

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Abstract

This paper seeks to explore the critical role of technology in improving education, inclusion of women in the workplace and promoting gender equality in Africa. The paper states *inter alia* that while there have been positive strides in reducing gender inequality in Africa, inequities amongst African men and women in terms of access to education and technology still persist and consequently have a negative impact on socio-economic progress and perpetuate societal inequities. The paper explains why women are disadvantaged due to societal inequities and examines the historical trends regarding the effort of governments and well-meaning private institutions in Africa to bridge the gender gap (including resultant legislation), and their net effect. The paper states categorically that while positive strides have been made, there is room for improvement. It emphasizes the importance of technology savviness in aiding advancement in the workplace and society, and how a lack of equal access to technology can be disadvantageous to women and consequently the society at large. It also states the positive influence of technology in augmenting literacy rates, skill development, and overall educational outcomes, thereby contributing to a more equitable society. The paper acknowledges potential challenges and considerations, including issues related to lack of infrastructure and funding, and proposes the necessity for tailored policies to ensure the inclusive adoption of technology in education. This research work analyzes relevant laws and historical trends and employs both primary and secondary sources in coming to its conclusions. The paper concludes that there is indeed a positive variance between improving equitable technological savviness amongst men and women (including using cutting edge technology for education and in the workplace) and reducing gender equality in Africa. The paper advocates a paradigm shift towards a technology-driven educational and workplace landscape as an essential prerequisite for achieving enduring gender equality in Africa.

Keywords: Cutting edge technology, Gender equality, education, Digital literacy, women's rights.

1. Introduction

It is obvious that the world is dynamically speeding towards a new era of artificial intelligence with modern technologies evolving every day; it behoves us as agents of gender equity, to find ways of utilizing the progression of the new age towards advancing gender equality in Africa. One of the world's most comprehensive and progressive women's human rights instruments is the Protocol to the African Charter on the Rights of Women in Africa ('the Maputo Protocol')¹. The Protocol guarantees extensive rights to women, including the right to take part in the political processes, to social and political equality with men, improved autonomy in their reproductive health decisions, and an end to harmful traditional practices such as female genital mutilation, among others. Here are extracts of the Maputo Protocol, which speak to the obligation for States to ensure parity in access to education, and specifically, to science and technology.

Article 2(2).

States Parties shall commit themselves to modify the social and cultural patterns of conduct of women and men through public education, information, education and communication strategies, with a view to achieving the elimination of harmful cultural and traditional practices and all other practices which are based on the idea of the inferiority or the superiority of either of the sexes, or on stereotyped roles for women and men²."

Article 12 Right to Education and Training

1. States Parties shall take all appropriate measures to:

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¹Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa 2003 adopted in Maputo, Mozambique 11th July 2003, entered into Force 25th November 2005.

²Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa, Article 2(2)

- a) eliminate all forms of discrimination against women and guarantee equal opportunity and access in the sphere of education and training;
- b) eliminate all stereotypes in textbooks, syllabuses and the media, that perpetuate such discrimination;
- c) protect women, especially the girl-child from all forms of abuse, including sexual harassment in schools and other educational institutions and provide for sanctions against the perpetrators of such practices;
- d) provide access to counselling and rehabilitation services to women who suffer abuses and sexual harassment;
- e) integrate gender sensitisation and human rights education at all levels of education curricula including teacher training.

2. States Parties shall take specific positive action to:

- a) promote literacy among women;
- b) promote education and training for women at all levels and in all disciplines, particularly in the fields of science and technology;
- c) promote the enrolment and retention of girls in schools and other training institutions and the organisation of programmes for women who

2. Technology as a Tool for Socio-economic Empowerment

Technology had not reached the level it is today, when the Maputo Protocol acknowledged and incorporated the need for wholesome education, and the need for women to be quick on the uptake, with science and technology. Technology is defined as the sum of techniques, skills, methods and processes used in the production of goods and services or in the accomplishment of desired objectives³. As a noun 'cutting edge' refers to the sharp edge of a blade that is used to cut objects. 'Cutting edge', as an adjective, refers to something that is extremely advanced and new. Cutting edge technology refers to the latest and most advanced tools, techniques, and platforms that are currently available in the software development industry.

³<https://artsandculture.google.com/entity/technology/m07c1v?hl=en> Accessed on 05/08/2023

The term is sometimes contrasted with “bleeding-edge,” which refers to technologies that are so new that they are not quite ready for mass adoption. The use of cutting-edge technology in software development offers significant benefits, such as improved performance and efficiency, access to new and advanced features, and a competitive advantage in the market⁴. Technology begets technology, hence innovations evolve faster and faster. The key leading-edge technologies being utilized and investigated by software developers today include⁵:

a) Artificial Intelligence (AI)

AI is helping software developers with advanced automation, advanced algorithms that can test code to identify and fix bugs. But more than that, AI can even generate code today, greatly augmenting the output of human programmers.

b) Low-code

One of the biggest changes in software development in the last few years has been the advent of low-code solutions. These platforms allow business users and developers to create applications much faster than traditional coding methods by using graphical user interfaces. Even non-programmers can create small but powerful apps just by dragging and dropping functional elements.

c) Serverless Computing

Moving computer resources offsite and into the cloud is facilitating more efficient code development and driving down costs. That’s because it eliminates the need to provision, manage, and scale servers, reducing infrastructure costs and allowing organizations to only pay for the resources they actually use. It also gives skilled employees more time to focus on their code, not dealing with hardware issues.

d) Microservices

Instead of building giant, monolithic apps and services, there is a recent push to break software solutions into an array of microservices that all work together seamlessly. By distributing application components across multiple

⁴<https://www.unosquare.com/blog/the-pros-and-cons-of-using-cutting-edge-technology-in-software-development/#:~:text=Cutting%2Dedge%20technology%20refers%20to,quite%20ready%20for%20mass%20adoption>. Accessed on 22/8/2023

⁵*Ibid*

services, microservices help to ensure that applications continue to function even if one component fails, improving overall resilience.

e) Natural Language Processing (NLP)

Machine learning and AI-enhanced software development tools are increasingly leveraging Natural Language Processing. These systems attempt to understand text input much the same way humans can. NLP algorithms are being used by developers to classify and analyze text data, helping them extract insights from large datasets and build applications that respond intelligently to text inputs

3. Women: A Disadvantaged Group

Women are empirically acknowledged as being more technological shy than the men. From the homes to the offices, women when challenged with technological know-hows are more likely to look around for the boy/man to solve the problem. Some women cannot operate hi tech remote controls of television sets at home and would scream for help from the boys/men. The phones in our hands are enigmas to some of us, as we do not utilise up to 30% of their functions. This attitude by itself has left women behind in technological professions. Thankfully, many of our daughters are better than we are. We need it to be so, to ensure gender equality in our age and clime.

Historically, women all over the world were discriminated against in a variety of ways including: human trafficking⁶ (which is done primarily for domestic servitude and sexual exploitation), not having the right to vote, domestic violence⁷, prohibition from owning and inheriting property, unequal wages and treatment at the workplace, gender-based violence, lack of access to education, to mention a few. In recent years, the role of women in society has been expanded beyond their traditional roles with emphasis on gender equality and emancipating women through the initiatives and actions

⁶ According to a commentator, females under the age of 18 are the highest victims of human trafficking in Africa. See Myranda Campanella, 'Violence Against Women in Africa', *Borgen Project*, 03.09.2020: <https://borgenproject.org/violence-against-women-in-africa/#:~:text=African%20women%20have%20experienced%20inequality%20in%20many%20aspects,lesser%20access%20to%20education%20and%20formal%20job%20opportunities>. (accessed 28.07.2023).

⁷ According to statistics by the World Health Organization, 1 in every 3 women worldwide have been subjected to either sexual or violence by their partners. See World Health Organization, 'Violence against women', *WHO Newsroom*, 9.03.2021: <https://www.who.int/news-room/fact-sheets/detail/violence-against-women> (accessed 31.07.2023).

of governments and concerned private sector participants. However, despite significant progress, gender disparities continue to persist worldwide, and Africa is no exception. Societal and cultural factors, along with limited access to resources and opportunities, have hindered women's involvement in the workplace. Nevertheless, technology and education has the potential to serve as a catalyst for change, empowering women and promoting gender equality in Africa's workspace as the increasing use of technology is creating opportunities for all women all over the world to live better lives.⁸

4. Gender Equality in Africa: Historical Context and the Current Trend

Gender discrimination (especially that of women) in Africa has persisted for donkey years, deeply pervading every stratum of society including: economic, political and cultural dimensions. Over time, African women have encountered countless obstacles, enduring unequal treatment and restricted opportunities in contrast to men. Prior to the advent of colonialism in Africa, gender roles were often clearly defined and deeply embedded in cultural practices and beliefs. Men were responsible for 'productive' work (such as hunting, farming, and political governance), while women were primarily assigned domestic duties and childcare responsibilities.⁹ Despite playing essential roles in their communities, women's access to education, property, and decision-making positions was significantly limited. The colonisation of Africans by Europeans worsened gender disparities. The colonialists propagated patriarchal norms as they imposed their legal systems and other practices on communities.¹⁰ They often jettisoned traditional African practices that gave women certain rights and authority, thereby reinforcing gender inequality. For example, in Yoruba land, there was the Iyalode who was a high ranking female chieftain in the land whose role was to represent

⁸ United Women, *'In focus: UN Commission on the Status of Women (CSW67)'*, 27.02.2023: <https://www.unwomen.org/en/news-stories/in-focus/2023/02/in-focus-un-commission-on-the-status-of-women-csw67> (accessed 31.07.2023).

⁹ E. Kiptot, *'Gender Roles, Responsibilities, and Spaces: Implications for Agroforestry Research and Development in Africa'*, World Agroforestry Centre: <https://www.jstor.org/stable/26431617#:~:text=Women%20in%20Africa%20are%20generally,shared%20responsibility%20for%20the%20household.> (accessed 01.08.2023).

¹⁰ Furaha Saungweme, *'A Critique of Africa's Post-Colonial Freedoms Through a Feminist Lens: Challenging Patriarchy and Assessing the Gains'*, Heinrich BöllStiftung, 07.07.2021: <https://za.boell.org/en/2021/07/07/critique-africas-post-colonial-freedoms-through-feminist-lens-challenging-patriarchy> (accessed 01.08.2023).

the interests of women in governance.¹¹ This is not to say that the pre-colonial system was perfect but existing prejudices were merely exacerbated by the European colonisers. In Nigeria, men and European companies were the major players in businesses such as the distribution of rubber, groundnut and palm oil as the countries relied heavily on agricultural exports to grow. This further pushed women to the side lines. The customary land ownership which recognised ownership of lands by families was slowly erased and with societies being more capitalistic, land was owned primarily by the wealthy.¹² Following the attainment of independence by various countries in Africa, there was light at the end of tunnel as many nations' constitutions provided for women rights and anti-discrimination¹³. For example, Section 42 of the Constitution of the Federal Republic of Nigeria 1999 (as Amended) states that no Nigerian should be discriminated against due to the circumstances of his/her birth¹⁴. However, in reality, progress towards gender equality has been slow as traditional patriarchal structures persist.

During the course of the 20th century, African women's rights activists initiated mobilization efforts, advocating for parity in rights and opportunities. They played pivotal roles in the anti-colonial movements and subsequently in the pursuit of democracy and human rights. Their endeavours not only raised awareness about gender discrimination but also paved the path for incremental policy shifts.¹⁵ Over the past few decades,

¹¹ Nigerian Wiki, 'Iyalode': <https://nigerianwiki.com/Iyalode> (accessed 01.08.2023).

¹² *Ibid* fn 7.

¹³ Following from the recognition that women's rights are often marginalised in the context of human rights, specific human rights conventions and laws have been made to address specific needs of women. These include the Convention on the Elimination of all forms of Discrimination against women, The Beijing Platform for Action, Protocol to the African Charter on Human and Peoples' Right on the Rights of Women, etc. These instruments guarantee in a comprehensive manner, rights relating to the peculiar needs and challenges of women; such as: elimination of discrimination against women, elimination of harmful practices against women, rights in marriage, separation, divorce and annulment of marriage, access to justice and equal protection before the law, right to participation in the political and decision making process, protection of women in armed conflict, right of women to education and training, economic and social welfare rights, health and reproductive rights, right to food security, right to adequate housing, right to positive cultural context, right to health and sustainable environment, right to sustainable development, widows' rights, right to inheritance, special protection of elderly women, special protection of women with disabilities and women in distress.

¹⁴ See also the case of *Mojekwe v Mojekwe* [1997] 7 NWLR (Pt. 512) 283 at 304E – 305C, where the Court of Appeal held per *Tobi, JCA (as then was)*, that the Oli-Ekpe custom which prevented women inheriting property was repugnant to justice being that Nigeria is an egalitarian society.

¹⁵ See Iris Berger, 'African Women's Movements in the Twentieth Century: A Hidden History', *African Studies Review*, Volume 57, Number 3 (December 2014), p.3:

African nations have made remarkable strides in advancing gender equality. Numerous countries have undertaken legal reforms to safeguard women's rights, encompassing measures to combat gender-based violence, reform inheritance laws, and enhance the representation of women in politics.¹⁶ Although there has been progress, gender discrimination remains deeply rooted in African societies. Women's advancement is still hindered by gender-based violence, unequal access to education and healthcare, and limited economic opportunities. Nevertheless, numerous organizations, governments, and individuals are tirelessly working to tackle these challenges and promote gender equality in Africa. As Africa progresses, it is crucial to keep prioritizing gender equality, striving to create a more just, inclusive, and prosperous continent for all its people.

5. The Digital Literacy Gap in Africa

Digital Literacy can be defined as “the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship. It includes competences that are variously referred to as computer literacy, ICT literacy, information literacy and media literacy.”¹⁷ A high digital literacy level in Africa is useful because it would boost education, innovation, and economic growth.¹⁸ A recent report by the International Finance Corporation stated that the market size for teaching digital skills through 2030 across Sub-Saharan Africa, is estimated at approximately \$130 billion with a potential target market of 650 million

https://genderandsecurity.org/sites/default/files/Berger_-_African_Ws_Movements_in_the_Twentieth_Century.pdf (accessed 01.08.2023).

¹⁶ 'Africa Human Development Report 2016: Accelerating Gender Equality and Women's Empowerment in Africa', *United Nations Development Programme*, p.vi: https://www.undp.org/sites/g/files/zskgke326/files/publications/AfHDR_2016_lowres_EN.pdf (accessed 01.08.2023).

¹⁷ Nancy Law et al, 'A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2', *United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics, UIS/2018/ICT/IP/51*, June 2018, p.6: <https://unesdoc.unesco.org/ark:/48223/pf0000265403/PDF/265403eng.pdf.multi> (accessed 31.07.2023).

¹⁸ George Asamani, 'Bridging the Digital Divide in Africa: How Technology and Education can empower the next generation', *Businessday.ng*, 21.02.2023: <https://businessday.ng/opinion/article/bridging-the-digital-divide-in-africa-how-technology-and-education-can-empower-the-next-generation/#:~:text=According%20to%20the%202021%20Ibrahim,coupled%20by%20a%20mobile%20net%20work.> (accessed 28.07.2023).

people in need.¹⁹ This is evidenced by an increase in technology business and investments in Africa. For example, according to Partech's 2021 Africa Tech Venture Capital Report, investments in technology businesses and start-ups within Africa grew faster than any other region as \$6 billion dollars (both in debt and equity financing) was raised by them.²⁰ This was spurred in part by the success of Fintech and the consequential rise of African techpreneurs.

The emergence of new and successful technology businesses such as Flutterwave, Paystack, Piggyvest, Kuda and Opay in Africa have birthed improvements in digital literacy in Africa as there has been increased adoption of fintech which was driven by the lockdown which characterised the Covid-19 era. It should however be noted that due to microeconomic challenges, investments in the African technology space have slowed down considerably in 2023. To buttress this point, analysis shows that Venture Capital firms only invested \$951 million in African technology businesses in H1 2023, which is a 50% decline from H1 2022.²¹ While digital is essential for inclusive growth and innovation, there is still a huge deficit in Africa. According to World Bank statistics, only 50% of African countries have computer education as part of their curriculum. This is as opposed to 85% of countries globally that have computer education in their curriculum.²² The Digital Literacy deficit in Africa is further worsened by the migration of talent to other countries and Africa's macroeconomic challenges. A proposal is that digital skills should be embedded in the entire curriculum rather than taught separately. Children should be applying digital skills in their maths and literature classes, although a standalone digital skills class may still be useful.

¹⁹ International Finance Corporation and L.E.K Consulting, *'Digital Skills in Sub-Saharan Africa Spotlight on Ghana'*, p.10: <https://www.ifc.org/content/dam/ifc/doc/mgrt/digital-skills-final-web-5-7-19.pdf> (accessed 29.07.2023).

²⁰ Partech Partners, '2021 Africa Tech Venture Capital Report': <https://partechpartners.com/2021-africa-tech-venture-capital-report/> (accessed 29.07.2023).

²¹ Ephraim Modise, *'Africa VC funding dips by 54% in H1 2023, as accelerators lead the way in cheque-writing'*, *techcabal*, 11.07.2023: <https://techcabal.com/2023/07/11/africa-vc-funding-h1/> (accessed 24.07.2023).

²² Salah-EddineKandri, *'Africa's future is bright—and digital'*, *World Bank Blogs*, 23.10.2019: <https://blogs.worldbank.org/digital-development/africas-future-bright-and-digital> (accessed 31.07.2023).

While the use of technology holds a lot of promise in Africa, it is delayed by infrastructural deficits and the digital literacy gap as explicated above. Infrastructural deficits that have slowed down the widespread use of internet in Africa include lack of access to reliable internet and high level of poverty that makes basic digital technological devices and internet access unaffordable for the bottom segment of the market. Recent statistics by the World Bank show that only 22% of people living in sub-Saharan Africa use mobile internet services despite the fact that 54% live in areas where there is 4G internet.²³ It was also shown that the price of 1.5 gigabytes for 1 month - a data bundle that typically covers a few hours of daily use for a month, is equivalent to approximately one-third of 40% of Africans' income.²⁴ This shows that while the use of technology holds great potential in Africa, urgent action and strategy formulation towards addressing data illiteracy, digital skills shortages and access to credit, has to be undertaken by governments and other relevant stakeholders to ensure that the technology is properly harnessed and its potential is realised in sub-Saharan Africa.

6. The Gender Digital Literacy Gap in Africa

As stated above, it is intrinsic to note that while the statistics on digital literacy in Africa are very concerning, an analysis of the statistics with emphasis on access of technology by men and women paints a more horrid picture. For instance, 16 % fewer Nigerian women than men use technology.²⁵ Evidence also shows that in countries in sub-Saharan Africa, there is a 43% discrepancy in women's access to the internet in comparison to that of men.²⁶ This gap is largely driven by the following factors: draconian customs and traditions that subjugate women and unaffordability

²³ Office of the Chief Economist, 'Digital Africa: Technological Transformation for Jobs', World Bank, Press Releases, 13.03.2023: <https://www.worldbank.org/en/region/afr/publication/digital-africa> (accessed 20.07.2023).

²⁴ *Ibid.*

²⁵ Felix Aguboshim et al, 'Closing ICT usability gaps for Nigerian women and girls: Strategies for reducing gender inequality', World Journal of Advanced Research and Reviews, 03.07.2022, 15(01), 056-063, p.67: <https://wjarr.com/sites/default/files/WJARR-2022-0665.pdf> (accessed 01.08.2023).

²⁶ Maria Barron et al, 'Preparing Girls for the Future of Africa: Approaches to Empowerment through Digital Skills', World Bank, 27.04.2023: [https://blogs.worldbank.org/education/preparing-girls-future-africa-approaches-empowerment-through-digital-skills#:~:text=In%20Sub%2DSaharan%20Africa%20\(SSA,57%25%20of%20men%2C%20respectively.](https://blogs.worldbank.org/education/preparing-girls-future-africa-approaches-empowerment-through-digital-skills#:~:text=In%20Sub%2DSaharan%20Africa%20(SSA,57%25%20of%20men%2C%20respectively.) (accessed 22.07.2023).

of technological devices and internet access.²⁷ The lack of digital literacy amongst women in Africa and the world at large has led to women being excluded in the Information and Technology fields. This means that the technology sector is dominated by men and the technology produced is largely customised to the preference of men.²⁸ According to findings by Boston Consulting Group (BCG), gender diversity in leadership of technology companies fell to 59% in 2021.²⁹

6.1 Bridging the Gender-Gap through Technology: *Medical Advancements/Innovations*

Historically and till date, continuous technological innovations in fields of medicine play an important role in entrenching gender equality. Prior to the dawn of the 20th century, most women did not work outside the home. This was in part driven by high illiteracy and societal customs that necessitated women to be primarily relegated to household chores and unsafe factory work. The evidence shows that as soon as most women got married, they left the workforce.

Another factor that affected women's ability to participate in the workplace was their biological idiosyncrasies such as having menstrual flows, and an inability to effectively control pregnancy. Medical innovations have played a critical role in allowing women to be included in the workplace. Jordan Peterson -a renowned psychologist and political commentator once stated as follows:

...throughout history, men and women both struggled terribly for freedom from the overwhelming horrors of privation and necessity. Women were often at a disadvantage during that struggle, as they had all the vulnerabilities of men, with the

²⁷ Victoria Kwakwa, 'Accelerating Gender Equality: Let's Make Digital Technology Work for All', *World Bank Blogs*, 07.03.2023: <https://blogs.worldbank.org/african/accelerating-gender-equality-lets-make-digital-technology-work-all> (accessed 21.07.2023).

²⁸ Estimates show that women only make up 25% of employees in the technology sector. See Tech Funnel, 'International Women's Day: The Latest Women in Tech Statistics to Know in 2023', 19.04.2023: <https://www.techfunnel.com/information-technology/women-in-tech/#:~:text=According%20to%20research%2C%20women%20make,roles%20are%20held%20by%20women> (accessed 25.07.2023).

²⁹ NeveenAwad et al, 'The Pandemic's Lasting and Surprising Effects on Women in Tech', *Boston Consulting Group*, 11.08.2022: <https://www.bcg.com/publications/2022/how-the-pandemic-continues-to-affect-female-leaders-in-tech> (accessed 26.07.2023).

extra reproductive burden, and less physical strength. In addition to the filth, misery, disease, starvation, cruelty and ignorance that characterized the lives of both sexes, back before the twentieth century (when even people in the Western world typically existed on less than a dollar a day in today's money) women also had to put up with the serious practical inconvenience of menstruation, the high probability of unwanted pregnancy, the chance of death or serious damage during childbirth, and the burden of too many young children. Perhaps that is sufficient reason for the different legal and practical treatment of men and women that characterized most societies prior to the recent technological revolutions, including the invention of the birth control pill.³⁰(Emphasis supplied).

The above quote shows that the advancement of birth control methods had a critical role to play in advancing women rights especially. To give credence to the preceding statement, we should do an analysis of the evolution of birth control methods. In the 1800s, the Egyptians used fermented leaves, and donkey milk as contraceptives. In 1839, rubber was used for birth control for the first time in history with mass production of rubber condoms happening 20 years later. In 1957, the first birth control pills (which included artificial progesterone and oestrogen) were created by Margaret Sanger and her friends. In 1960, emergency contraceptive pills were made. In more recent time, the first contraceptive mobile application was created and launched by Karolinska Institutet, which shows fertility using an accompanying thermometer.³¹

There is no doubt that women are under pressure to figure out their family and career in their middle terms and this creates pressure on women to either slow down their career or put a hold on having children.³² With reliable birth

³⁰ Jordan Peterson, *'12 Rules for Life: An Antidote to Chaos'*, published by Allen Lane, 2018, p.206: <https://nasihah.net/wp-content/uploads/books/12-Rules-for-Life.pdf> (accessed 01.08.2023).

³¹Mårten Göthlin, *'Timeline: Contraceptives'*, Karolinska Institutet, first published in Swedish in *MedicinskVetenskap* no 3/2017, reviewed by Cecilia Odling on 13-09-2022: <https://ki.se/en/research/timeline-contraceptives> (accessed 31.07.2023).

³² Adam McCulloch, *'Gender equality: 'Men and women are not the same and won't be''*, *Personnel Today*, 13.03.2018: <https://www.personneltoday.com/hr/jordan-peterson-gender-pay-gap-exist/> (accessed 01.08.2023).

control mechanisms, women can with greater certainty determine when they decide to get pregnant. This gives them the much-needed flexibility to advance further in their careers without being slowed down by unplanned pregnancies. Other medical advancements like the freezing of eggs, surrogacy and even in-vitro fertilisation help women to either outsource or defer having a child entirely without the need to worry about menopause. Furthermore, the creation of appropriate menstrual products (such as tampons, disposal pads, and modern menstrual caps)³³ has also helped women to be integrated into the workplace as they now have the freedom to move freely and work without any fear of embarrassment and stigmatisation. While there is no direct evidence that advancements in medical innovations caused women to be more included in the workspace thereby reducing gender equality, there is at a minimum evidence to show that there is a positive correlation (and necessary causation) between the advancement of birth control and sanitary products and the integration of women in the workplace.

6.2 Other conventional forms of technology.

In recent times, there has been increasing adoption of technology especially in sub-Saharan Africa. This was partly as a result of the Covid-19 pandemic. Due to restrictions that were placed on physical transactions during the covid-19 era, businesses and individuals had to adopt innovative ways of transacting.³⁴ The benefits of harnessing technology during this time still persist and have helped in erasing gender disparities. They include:

(i) Video-conferencing tools like Zoom, Microsoft Teams, Google Meets

One of the forms of technology that was adopted on a larger scale both in Africa and globally was video-conferencing tools like Zoom, Microsoft

³³ Megan Cummings, 'The Evolution of Menstrual Products', *Mymed.com*: <https://www.mymed.com/health-wellness/interesting-health-info/the-evolution-of-menstrual-products#:~:text=The%20first%20absorbent%20disposable%20sanitary,French%20nurses%20found%20in%20hospitals>. (accessed 30.07.2023).

³⁴Ritu Srivastava, 'Tech in Pandemic Response, But Many Left Behind: Lessons from Africa', *ORF Issue Brief No. 609, 03. 2023, Observer Research Foundation*: <https://www.orfonline.org/research/tech-in-pandemic-response-but-many-left-behind/>(accessed 01.08.2023).

Teams, Google Meets to host virtual meetings in the workplace.³⁵ Videoconferencing tools can give women the flexibility they need to succeed in their careers. The use of video conferencing technology removes the need for women (and men) to be physically present at work to be able to hold collaborative meetings with their team members easily. This means that women can mix-up their traditional gender roles with work in an easier manner.

(ii) The use of social media

Social media has been used by feminists and activists to bring awareness to challenges that women face in society. The role of social media in our daily lives is of utmost importance, as it greatly influences our social values. UN Women has been working in partnership with private sector organizations to harness the power of media, especially social media, as a potent tool to advocate for gender equality and the elimination of violence against women.³⁶ A good example of when social media has been utilised to bring awareness to discrimination and mistreatment is the #metoo movement. It started as an initial post by Alyssa Milano which stated as follows: “*If you’ve been sexually harassed or assaulted write ‘me too’ as a reply to this tweet.*” 24 hours after the tweet, she got 500 replies. This brought awareness to sexual assault and gave a lot of women who had been victims of sexual assault the courage to speak out about their experiences without fears of being stigmatised. It also led to the investigation and conviction of offenders who had gone unpunished for a long time.³⁷ Another notable mention is the UN’s HeForShe movement (which was in part driven by social media) which extends an invitation to men and individuals of all gender identities to unite in solidarity with women, forming a powerful, conspicuous, and

³⁵ Natasha Dhawan et al, ‘*Videoconferencing Etiquette: Promoting Gender Equity During Virtual Meetings*’, *Journal of Women’s Health*, 19.04.2022: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064948/#> (accessed 01.08.2022).

³⁶ ‘*Using Media to Promote Gender Equality*’, *UN Women*: <https://asiapacific.unwomen.org/en/countries/china/using-media-to-promote-gender-equality#:~:text=Media%20plays%20a%20very%20important,women%20and%20promote%20gender%20equality>. (accessed 31.08.2023).

³⁷ Rachel Haas, ‘*One year on from the #MeToo movement, what exactly has changed?*’, *World Economic Forum*, 26.11.2018: https://www.weforum.org/agenda/2018/11/metoo-women-equality-one-year-later/?DAG=3&gclid=Cj0KCQjw2qKmBhCfARIsAFy8buJd1AhiE_3c4PNj_2NufaFOfn2FJXZMdlmWH3kJgGlnPB3XynLnjG8aAoRIEALw_wcB (accessed on 02.08.2023)

unified movement for gender equality.³⁸ The above efforts can also be replicated in Africa so that social media would play a positive role in reducing the gender disparities in all segments of society, and drive inclusive and sustainable growth.

(iii) Remote Work

Remote work offers numerous advantages for women, ranging from improved life and family management to extended career longevity.³⁹ According to Ola Brown – Country Manager for Microsoft Nigeria, “*Innovation surges when diversity increases and one thing that remote and hybrid workplaces have enabled is more diverse hiring.*”⁴⁰ Remote work opportunities create a “win for all” outcome for all parties involved. Due to the flexibility and reduced costs for both business and their employees, it is attractive for workers (especially women). Statistics also show that women are likely to earn similar wages with their male counterparts when working remotely. Remote work creates a work-life balance for employees which is mostly beneficial to women. This gives women the ability to focus on their families and carry out their traditional gender roles. Adoption of remote work or at minimum a hybrid environment is therefore an important device that can be utilised to reduce gender equality.

(iv) Remote Learning

During Covid-19, schools across Africa and all over the world were forced to adopt EduTech and innovative solutions to teach students without the need of physically meeting with them.⁴¹ Edutech like Coursera, Udemy and Edx have also been increasingly used. Furthermore, innovative schools like Nexford University which issues degrees are also in demand. Since Edutech do not have the overhead of traditional educational institutions, they make education more affordable and accessible to wide range of people all over

³⁸ Price Waterhouse Coopers, ‘UN Women HeForShe Alliance’, n.d.:

<https://www.pwc.com/gx/en/about/diversity/he-for-she.html> (accessed 01.08.2023).

³⁹ Rachael J, ‘How Remote Work Supports UN Sustainable Development Goal No. 5 of Achieving Gender Equality’, Flexjobs blogs: <https://www.flexjobs.com/blog/post/remote-work-un-sdg-gender-equality/> (accessed 01.08.2022)

⁴⁰ ChukaUroko, ‘How Remote Work is [Bridging] Gender Gap in Workplaces’, *Businessday*, 28.03.2022: <https://businessday.ng/news/article/how-remote-work-is-bridging-gender-gap-in-workplaces/> (accessed 02.08.2023).

⁴¹ DiogoOmaro et al, ‘COVID-19 and education: The Digital Gender Divide among Adolescents in Sub-Saharan Africa’, UNICEF, 4.08.2020: <https://data.unicef.org/data-for-action/covid-19-and-education-the-digital-gender-divide-among-adolescents-in-sub-saharan-africa/> (accessed on 02.08.2022).

the world. If properly utilised, remote learning can be a useful tool in eliminating gender disparity *vis-à-vis* access to quality education in Africa. Governments therefore have to develop policies that would improve the adoption of Edutech without compromising the quality of education.⁴²

(v) Scheduling tools

Work scheduling tools like Calendly and Google Calendar can play a significant role in bridging the gender disparity gap within workplaces. While these tools may not directly address gender disparities, they contribute to creating a more inclusive and equitable work environment in several ways. They include: (i) providing transparent and accessible calendars, making it easier for other team members to see each other's availability; (ii) facilitating flexible work arrangements that accommodate personal and family responsibilities which can be especially beneficial for women, as they often face additional societal expectations related to family commitments. While work scheduling tools alone cannot completely eliminate gender disparities in the workplace, they certainly contribute to fostering a more inclusive and equitable environment.

(vi) Online Networking/Recruiting

Various online recruiting agencies and Apps exist that have reduced the need for physical interviews which sometimes discourage female applicants in certain employment environments. In these social employment networks and recruiting procedures, qualifications and competences take the pride of place in the recruitment exercises. The procedures are transparent and do not allow for sexualisation of the process.

(vii) Online Marketing

Online marketing is a set of tools and methodologies used for promoting products and services through the internet. Online marketing includes a wider range of marketing elements than traditional business marketing due to the extra channels and marketing mechanisms available on the internet. Online marketing is also known as internet marketing, web marketing, or digital marketing. It includes several branches such as social media marketing (SMM), search engine optimization (SEO), pay-per-click

⁴² It should be noted that the licencing of universities in Nigeria is primarily done by the National Universities Commission. The requirement of a physical before provincial and final licences can be given to universities might slow down the adoption of degree issuing EduTechs.

advertising (PPC), and search engine marketing (SEM). Online marketing can deliver benefits such as growth in potential, reduced expenses, elegant communications, better control, improved customer service and competitive advantage.

6.3 Using cutting-edge technology in education and software development has the added advantage of:

(i) Improved Performance and Efficiency

Newer technologies are designed to offer faster, more efficient solutions to common problems in software development, making it easier for developers to produce high-quality software in less time. This can accelerate time-to-market, lower development costs, and improve the user experience.

(ii) Access to New and Advanced Features

With the continuous evolution of technology, new features are being developed all the time, and by using cutting-edge technology, businesses can take advantage of these advancements. For example, the use of artificial intelligence and machine learning is becoming increasingly common in software development.

(iii) Competitive Advantage in the Market

By staying ahead of the curve and using the latest technologies, businesses can differentiate themselves from their competitors and offer differentiated solutions to their customers — all of which help increase market share and brand recognition and improve customer satisfaction.

(iv) Cost savings

Upon final establishment and operation, goods and services become cheaper. This improves customer experience and competitiveness.

7. Challenges

It is apposite to state that if not properly harnessed, technology could have a negative impact on the good strides that have been engendering gender equality all over the world and be used as a tool to abuse women's right. Buttressing this point, during the 67th Annual Session of the United Nations (UN) on the Status of Women (CSW67) held in March 2023, AntónioGuterres - UN Secretary-General stated that *“The gender digital divide is fast becoming the new face of gender inequality...”*. He also opined

that the domination of new technologies by men is reversing gender equality as same means that power is concentrated more in the hands of men.⁴³ Examples of how technology can be used to abuse women's rights include cyber bullying, objectification of women⁴⁴ and revenge porn.

(i) Unguided Use of Social Media

There is the need to note that the social media can reduce productivity when used unguardedly. Women spend more time on social media for less productive activities than men. This is a big challenge to gender parity.

(ii) Talent Drain

Over reliance on hitechs in what has hitherto been recognised as high competence areas may lead to over-dependence on techs and a reduction in talents.

(iii) Lack of Tech Infrastructure

According to World Bank statistics, only 50% of African countries have computer education as part of their curriculum. This is as opposed to 85% of countries globally that have computer education in their curriculum.⁴⁵ The Digital Literacy deficit in Africa is further worsened by the migration of talent to other countries and Africa's macroeconomic challenges

(iv) Adoption and Implementation Costs

New technologies often require significant investments in time, money, and resources. Also, new technologies may not be compatible with existing systems and processes, requiring significant resources and effort to integrate them into an organization's operational infrastructure.

(v) Maturity and Stability Issues

New technologies are often untested and can be unreliable, which can result in compatibility issues and bugs. This can lead to increased development time and reduced user satisfaction, as well as an increased risk of project failure.

⁴³ United Women, *'Technology is playing key role in gender equality reversals, says UN Chief'*, 15.03.2023: <https://www.unwomen.org/en/news-stories/news/2023/03/technology-is-playing-key-role-in-gender-equality-reversals-says-un-chief> (accessed 31.07.2023).

⁴⁴ Dianova, *'Is Digital Technology a Driver or a Barrier to Gender Equality?'*, 08.03.2023: <https://www.dianova.org/opinion/is-digital-technology-a-driver-or-a-barrier-to-gender-equality/> (accessed 20.06.2023).

⁴⁵ Salah-Eddine Kandri, *'Africa's future is bright—and digital'*, *World Bank Blogs*, 23.10.2019: <https://blogs.worldbank.org/digital-development/africas-future-bright-and-digital> (accessed 31.07.2023).

(vi) Limited Community Support

With new technologies, there is often a smaller pool of skilled developers and a lack of established best practices and proven methodologies. That can make it difficult for businesses to find the support they need to successfully implement and use these technologies.

7.1 Emergence of new IT Systems in Legal Practice

From our discussion on the need for embracing cutting-edge technology and its effect in bridging the gender gap, there is a need to keep learning and upgrading our IT knowledge, in order not to create a new gender concern. There is need to be quick on technological uptake, as new IT systems emerge daily. Artificial Intelligence (AI) is on the rise and is changing the way we conduct legal and other researches. Recently, a company called ROSS Intelligence has started using the IBM called Watson in order to perform Legal Research. Specifically, the company is attempting to get Watson to understand and interpret the legal terminology used by lawyers in order to look up case law and statutes. It is of interest to know that many other firms are trying to develop similar technology that will enable lawyers delegate the task of reviewing contracts to a computer⁴⁶. Other areas of legal practice affected by technological advancement are:

- Filing of Processes: Many Courts today have court processes being filed electronically.
- Service of Processes. Courts are adopting electronic services in addition to the traditional methods of service of Court's processes.
- Virtual and Hybrid Court Proceedings are now conducted by Courts.

Legal practitioners (and students) must not shy away from these new methods of legal practice. Technology makes it easier for Attorneys to practice law while saving on large overhead costs. However, ICT literacy amongst legal practitioners and Judicial Officers is presently low and is affected by lack of the infrastructure needed to effectively mount the needed applications. There are still the issue of cyber security and inadequate

⁴⁶ Hon. Justice BB Kanyip PNICN, "The Future of Legal Practice in the Face of Emerging Technologies", Text of the Keynote Address Delivered on 30 November 2020 at the Annual Law Week of the Nigerian Bar Association (NBA) Branches in Enugu State, the theme of which is *Future of Legal Practice in the Face of Emerging Technologies*. The Law Week held at the Hon. Justice I. A. Umezulike Auditorium, High Court Complex, Independence Layout, Enugu

legislation to regulate ICT implementation. Therefore, with the rise of technology in legal practice, technology-based Continuing Legal Education (CLE) programs should be encouraged. This means that the traditional way of practice will gradually be de-emphasised. Cyber security/protection should be assured as Legal Practitioners have an obligation to keep the information and property of their clients safe and that includes keeping information away from hackers.

8. Conclusion/Recommendations

From the above explications, it is clear that the adoption of innovative technology and digital literacy plays an essential role in achieving gender equality in Africa as they can be used as tools to break down the barriers that have stopped women from reaching their potential and contributing to society. However, achieving gender equality through education and adoption of technology requires a collective effort from governments, educational institutions, and the private sector. Possible solutions to erase the digital literacy gaps and gender disparities in this regard include:

- (i) the formulation of policies and the development of bespoke infrastructure projects to support affordable and inclusive internet access;
- (ii) re-jigging the entire educational curriculum to include computer science courses across all levels of education and deploying edutech to teach students at all levels; and
- (iii) government support of technology-enabled firms including funding, skills and market access tailored to women.⁴⁷ Closing the gender disparity in digital literacy would help improve gender equality. While strides and considerable improvements have been made, as the aphorism states: “*it is not yet uhuru*”. Steps must therefore be taken to continually reduce and possibly eliminate the financial literacy gap in Africa and the world at large.

Conclusively, education and embracing cutting-edge technology are undeniably *sine qua non* to achieving gender equality in Africa. By

⁴⁷ Victoria Kwakwa, ‘Accelerating Gender Equality: Let’s Make Digital Technology Work for All’, *World Bank Blogs*, 07.03.2023: <https://blogs.worldbank.org/africacan/accelerating-gender-equality-lets-make-digital-technology-work-all> (accessed 21.07.2023).

embracing this holistic approach, we can create a future where every individual, regardless of gender, has an equal opportunity to thrive, contribute, and shape a brighter and more prosperous continent for all. While total gender equality might seem impossible to some,⁴⁸ it is important to note that we have taken several steps in actualising that journey of a thousand miles. There is therefore hope, that the future is brighter than today, in the gender indices of our dear continent.

⁴⁸ For example, according to World Economic Forum's 2018 Global Gap Index, if the current gender inequities persist, it would take 135 years to eradicate gender inequality. See LynseyChutel, *'It will take 135 years to Close the Gender Gap in sub-Saharan Africa'*, Quartz, 20.12.2018: <https://qz.com/africa/1503278/global-gender-gap-index-africas-gap-widens> (accessed 02.08.2023).