

# GENDER DISPARITIES IN ACCESS AND USE OF AI IN AFRICA

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The authors declare no conflict of interest. Data used for this research has either referenced or obtained during using survey conducted by the authors

## Dedication

*..... To the women who put in their best to make a difference in the world....  
"We see you"*

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our understanding of these three dimensions: technology, gender, and place.

The current literature lacks detailed insights into how women across the continent engage with various technologies, particularly in the emerging field of AI. While some studies explore challenges faced by women in technology broadly, only a few have focused specifically on AI's intersection with gender dynamics in Africa. This study aims to address the significant gap in understanding gender disparities in AI access and utilization within the African context.

To fill this gap, the research seeks to achieve the following objectives:

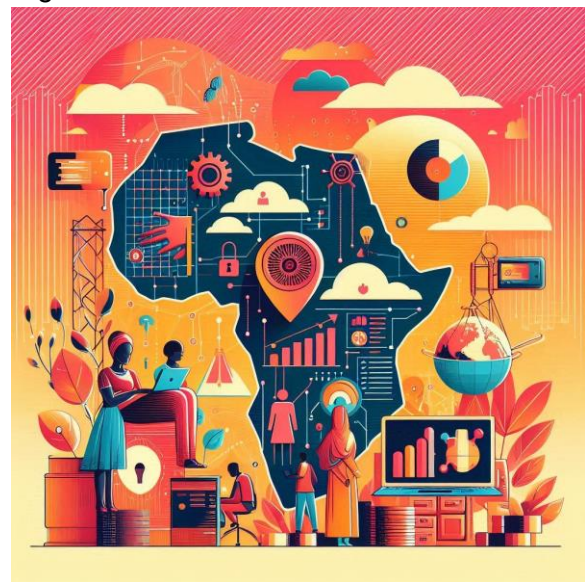
1. **Examine How African Women Use AI:** We will look closely at the current access to and use of AI technologies by women across Africa. Are certain regions more AI-literate than others? Are there some places where women tend not to use AI at all? These are the kinds of essential, pattern-emergent questions that can be investigated in order to gain a better understanding of AI utilization.

2. **Identify Barriers and Challenges:** What sort of investigation might we launch to understand what keeps women from the socio-economies of certain countries in Africa from putting this new knowledge to good use?

3. **Contextualize Gender Dynamics:** Recognize and analyze diverse gender dynamics and power structures across Africa to avoid generalizations and promote nuanced understanding.

4. **Propose Inclusive Strategies or broadly shared techniques:** Develop policy recommendations and strategies aimed at fostering inclusive development and maximizing AI's potential to benefit diverse communities across the continent. These should ensure developments that include all the communities that make up Africa's diverse population. The goal is to allow AI to give the same diverse range of benefits to Africa that it can give to the more homogeneous societies to the north.

By addressing these objectives, the study aims to deepen our understanding of the complex interactions between technology, gender, and geographical context in Africa. This research seeks to contribute towards closing the gender data gap, promoting equitable access to AI technologies, and supporting inclusive development in the region.



The focus of this research is on understanding the extent and nature of gender inequalities in access to artificial intelligence in many African nations. We hope that through a series of quantitative

surveys and close reading of the resultant data, we may understand not only where the disparities we speak of lie but also their intensity in different African contexts. Once disparities have been "quantified" in some form, the next stage will be to understand their nature in a close, qualitative way. We will sit with the women affected, host focus groups, and try to have conversations that can give "color" to the leaden state of affairs our numbers and charts may present.

For women in Africa trying to use AI, the odds are stacked against us. Understanding gender disparities in AI access and utilization is crucial for shaping effective policy interventions and initiatives aimed at promoting gender equity in the tech sector. By identifying and addressing barriers hindering women's access to AI technologies, this study seeks to contribute to the development of strategies that foster a more inclusive and equitable AI landscape in Africa. The findings will inform advocacy efforts and serve as a blueprint for further scholarly exploration into promoting gender equality in AI.

## **Literature Review**

This chapter reviews existing literature on gender disparities or unequal opportunities in access to and use of artificial intelligence (AI) technologies in Africa. Right now, across the world, not only is there a digital divide, but there is also an AI divide. In this context, the greatest AI divide is in sub-Saharan Africa. These include countries in Central Africa, East Africa, Southern Africa and West Africa. This is mostly a result of severe underfunding

and neglect of the African research community.

This literature review aims to assess the extent of women's engagement with AI compared to men and to identify barriers preventing women from fully utilizing these transformative technologies. Africa should emerge as a talent hub for the AI revolution, and it is not doing so because it is not just under-resourced; it is mostly a matter of not training half of its population to be participants in the AI revolution, and the participants are mostly men. As this chapter recognizes these disparities, it will also examine strategies proposed in the literature to mitigate these disparities.

## **Access to AI Technologies**

In Africa, uneven access to AI technologies prevails. It is influenced by infrastructural limitations and disparities in digital literacy. In a recent survey of artificial intelligence global penetration, the World Economic Forum found that AI resides mostly in 'industrialized societies'. Despite the growing adoption of AI in sectors like healthcare and agriculture, significant portions of the population, especially in rural areas, lack reliable internet access and technological infrastructure<sup>5</sup>.

Many people believe that AI is for those who seek advanced technology like being able to control a house with an electronic device such as Alexa or being able to start your coffee maker from your bed without going to the kitchen. AI is all these and more. It can transform both urban and rural management. It can be used by farmers and business

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<sup>5</sup> (Yu et al., 2023)



responsibilities for women, limiting their opportunities to engage with technology<sup>11</sup>. Additionally, women frequently lack the financial resources to purchase digital devices or pay for internet access. Even with access to mobile phones, the high cost of data remains a barrier. Poor internet infrastructure in many parts of Africa exacerbates these challenges, making consistent and reliable internet access a rarity. Addressing these disparities requires targeted interventions, such as community-based digital training programs and subsidies for internet access, to promote digital literacy and equitable access to AI technologies for women<sup>12</sup>

### **Utilization of AI Technologies**

Even when women in Africa have access to AI technologies, their utilization rates lag behind those of men. This disparity is influenced by several factors, including digital literacy, socio-cultural norms, and economic constraints. Research by UNESCO (2019) indicates that women are underrepresented in AI-related fields both academically and professionally, which limits their ability to influence AI development and deployment<sup>13</sup>. Socio-cultural norms often discourage women from pursuing careers in technology, creating a significant barrier to their engagement with AI<sup>14</sup>. Furthermore, economic constraints, such as limited financial resources and time due to household responsibilities, hinder women's ability to participate in AI training and education programs. To address these challenges, initiatives like targeted educational programs, mentorship, and

support networks are essential to enhance women's participation in the AI ecosystem. These efforts are crucial for promoting gender equity in the rapidly evolving AI landscape in Africa.

### **Utilization Patterns Among Women**

Research underscores that even when women have access to AI technologies, their utilization rates lag behind those of men. A study by UNESCO (2019) reveals that women are significantly underrepresented in AI-related fields both academically and professionally. This underrepresentation limits their influence on technology development and deployment, reinforcing existing gender biases within AI systems. Cultural norms often discourage women from pursuing careers in technology, further impeding their active participation in AI. Additionally, women frequently juggle multiple roles, including household responsibilities, which reduces their available time and resources to engage with AI technologies effectively. Economic constraints, such as lower income levels and limited access to funding for education and training, also play a crucial role in this disparity. To bridge this gap, it is essential to implement targeted educational programs, provide mentorship opportunities, and develop policies that support women's involvement in AI. These steps are vital for fostering a more inclusive and equitable AI landscape in Africa.

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<sup>11</sup> (Gillward et al., 2022)

<sup>12</sup> (Aranda-Jan & Qasim, 2023)

<sup>13</sup> (UNESCO & O'Hagan, 2024)

<sup>14</sup> (Per Scholars, 2024)

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## Factors Influencing Utilization

Several factors contribute to the lower utilization of AI technologies among women in Africa. Limited digital literacy is a significant barrier; many women lack the training needed to effectively engage with AI<sup>15</sup>. This gap in digital skills often starts early, as girls are less likely than boys to be encouraged to pursue STEM education. Time constraints also play a crucial role. Women often juggle multiple responsibilities, including domestic duties, which leaves them with less time to invest in learning and using new technologies<sup>16</sup>. Cultural norms further exacerbate this issue by prioritizing male participation in technology sectors, thereby marginalizing women's engagement with AI<sup>17</sup>. Additionally, economic factors cannot be ignored; women frequently face financial barriers that limit their access to AI tools and resources. Addressing these challenges requires a multifaceted approach, including education initiatives, financial support, and policy changes to promote gender equity in AI utilization.

## Barriers to Full Engagement

Women in Africa face significant barriers to fully engaging with AI technologies. Educational disparities are a primary obstacle; women are less likely to pursue STEM education, which is crucial for engaging with AI. Socio-cultural barriers also play a substantial role. In many African societies, traditional gender roles and cultural norms discourage women from



entering technology fields, pushing them to prioritize family responsibilities over career advancement. Economic barriers further compound these challenges. Women often have fewer financial resources and face greater economic constraints, limiting their ability to access AI technologies or participate in relevant training programs. These intersecting barriers hinder women's full participation in the AI ecosystem, highlighting the need for targeted interventions to promote gender equity and inclusivity in AI development and utilization across the continent. Addressing these issues is essential for fostering an inclusive technological future in Africa.

## Educational Barriers

Educational inequities pose significant barriers to women's engagement with AI technologies in Africa. Women are substantially underrepresented in STEM fields, which are crucial for developing proficiency in AI<sup>18</sup>. This disparity begins early, with fewer girls encouraged to pursue

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<sup>15</sup> (Porfido, 2020)

<sup>16</sup> (Schwartz, 1989)

<sup>17</sup> (Muckerheide, 2023)

<sup>18</sup> (Collett, 2022)

science and technology subjects in school compared to boys. Additionally, limited access to quality education and resources in many African regions exacerbates the problem<sup>19</sup>. According to UNESCO (2019), only thirty percent of Sub-Saharan African women receive STEM training, creating a substantial gender gap in AI-related fields<sup>20</sup>. This lack of education restricts women's opportunities to acquire the necessary skills and knowledge to engage with AI technologies effectively. Addressing these educational barriers is essential for fostering a more inclusive AI landscape, ensuring women have equal opportunities to participate in and benefit from advancements in AI. Promoting STEM education for girls from an early age is a crucial step in this direction.



### **Socio-cultural Barriers**

Socio-cultural norms across Africa significantly hinder women's pursuit of careers in technology, reinforcing gender

disparities in AI access and utilization. In many African societies, traditional gender roles often prioritize women's responsibilities at home over professional ambitions, particularly in male-dominated fields like technology<sup>21</sup>. These norms discourage girls from studying STEM subjects, limiting their future opportunities in AI-related careers. Furthermore, societal expectations and family pressures frequently dissuade women from seeking higher education or professional advancement in technology sectors. Studies indicate that these cultural constraints not only affect women's career choices but also their confidence and self-perception regarding their capabilities in tech fields<sup>22</sup>. Overcoming these socio-cultural barriers requires community-based interventions and advocacy to challenge and change these deep-seated norms, encouraging more women to enter and thrive in AI and other technology domains.

### **Economic Barriers**

Economic barriers significantly hinder women's access to AI technologies and relevant training in Africa, particularly in rural areas. The cost of digital devices and internet services is prohibitively high for many women, who often have limited financial resources. This economic constraint is compounded by the fact that training programs to develop AI skills are frequently too expensive or inaccessible. Rural women face even greater challenges due to fewer job opportunities and lower income levels compared to those in urban areas<sup>23</sup>. These financial obstacles make it difficult for women

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<sup>19</sup> (Musau, 2018)

<sup>20</sup> (UNESCO, 2023)

<sup>21</sup> (Mhlanga, 2024)

<sup>22</sup> (UN Women, 2018)

<sup>23</sup> (Kaduru, 2024)

to pursue education and careers in AI, thereby widening the gender gap in the technology sector. Tackling these economic barriers is essential to ensure women can participate equally in the AI revolution and contribute to inclusive economic development

### **Strategies to Mitigate Disparities**

Addressing gender disparities in AI utilization requires a multifaceted approach encompassing policy interventions, educational programs, and community and corporate initiatives. Policy interventions play a crucial role in promoting gender equality in education and employment, thereby creating an enabling environment for women to thrive in AI-related fields. Educational programs are essential for equipping girls and women with the necessary STEM skills from an early age, fostering their participation in technology sectors. Additionally, community and corporate initiatives are vital for providing mentorship, networking opportunities, and support systems that empower women in AI. By implementing these comprehensive strategies, stakeholders can work towards reducing barriers, increasing opportunities, and creating a more inclusive AI ecosystem that benefits everyone.

### **Policy Interventions**

Effective policy interventions are crucial for addressing gender disparities in AI access. Initiatives that promote gender equality in education play a pivotal role by encouraging more girls and women to pursue STEM

(Science, Technology, Engineering, and Mathematics) education, which is essential for engaging with AI technologies<sup>24</sup>. Additionally, policies offering financial incentives and scholarships for women in STEM fields can significantly enhance their representation in the technology sector, including AI-related disciplines. Legislative measures mandating gender diversity in technology companies and research institutions also foster inclusive environments for women<sup>25</sup>. These policy efforts are essential for creating opportunities that empower women to thrive in AI, contributing to technological innovation and economic advancement while reducing gender disparities in the digital landscape.



### **Educational Programs**

Educational programs tailored for women, such as coding bootcamps and scholarships in technology, play a crucial role in boosting

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<sup>24</sup> (Connolly, 2024)

<sup>25</sup> (MC Benning & Tabet, 2020)

their proficiency in AI<sup>26</sup>. These initiatives provide practical skills and opportunities that empower women to excel in STEM fields, including AI-related disciplines. By offering accessible and supportive learning environments, these programs help bridge the gender gap in technology education, enabling women to contribute more effectively to innovation and technological advancement. Investing in such educational initiatives is essential for ensuring equitable participation and fostering a diverse talent pool in the rapidly evolving field of artificial intelligence.

### Community and Corporate Initiatives

Community-based programs and corporate initiatives that mentor and support women in tech can dismantle socio-cultural barriers to AI engagement<sup>27</sup>. These initiatives provide mentorship, networking opportunities, and support systems that empower women to navigate and thrive in the technology industry. By fostering inclusive environments and addressing gender biases, community and corporate initiatives contribute to creating pathways for women to contribute meaningfully to AI development and innovation. Investing in these initiatives not only promotes diversity but also strengthens the overall resilience and adaptability of the tech ecosystem, ensuring that women have equal opportunities to shape the future of artificial intelligence.

### Research Methodology

The methodology adopted covered the research design; data collection methods, (including survey administration, focus groups, and key informant interviews), sampling techniques. It also includes multiple qualitative and quantitative approaches to provide richer descriptions of context.

This study employs a mixed-methods approach, integrating quantitative and qualitative data collection techniques. A structured survey was distributed using google forms and face to face interviews was conducted to gather more data.



A stratified random sampling method was used to guarantee an adequate number of participants from various regional, age, and economic backgrounds. The goal was to recruit thirty respondents who would represent approximately fifty percent of male

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<sup>26</sup> (WomenTechNetwork, n.d.)

<sup>27</sup> (Sekko, 2023)

population and fifty percent female of the female population.

To recruit participants for interviews and focus groups, we employed purposeful sampling by choosing people most capable of shedding light on artificial intelligence access in Africa, in other words, individuals with deep connections to AI and a strong understanding of its current state on the continent.

### Analysis of Findings

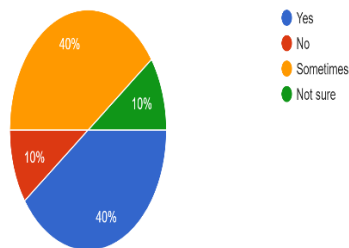
The survey received twenty four of thirty responses. The respondents were 70% female and 30% male. The response aligns with the research objectives which is to examine how African women use AI, identify barriers and challenges, contextualize gender dynamics, and propose an inclusive strategy for AI adoption, access and use by African women. The analysis of the data provides insights into these areas and highlights the key themes emerging from the responses.

aware of women in their community who own or have access to AI-enabled technology, although the extent of this access varies regionally. The frequency of AI usage is notably high, with daily and weekly usage being prevalent. The primary areas where AI technologies are applied include work, education, and personal use, indicating that these domains benefit most from AI advancements.

### Barriers and Challenges

The survey highlights several barriers and challenges that hinder women's access to and utilization of AI technologies. Poor internet connectivity and economic constraints are the most frequently cited obstacles. Additionally, socio-cultural norms, limited digital skills, and a lack of digital devices further impede women's ability to leverage AI technologies effectively. Awareness and training are critical areas where improvements are needed, as many respondents indicated a lack of understanding and skills related to AI.

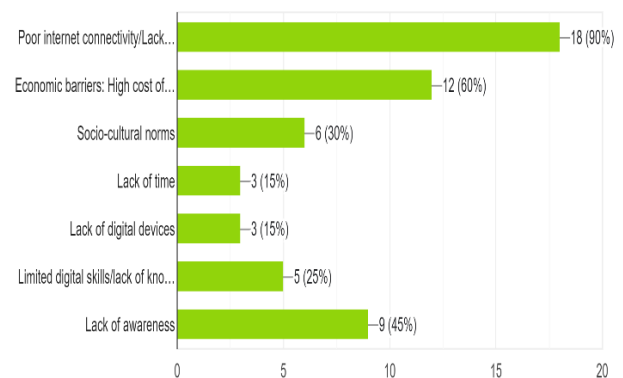
Women in your community who own or have access to use an AI enabled technology  
20 responses



### AI Literacy and Usage Patterns

The data reveals significant patterns in AI literacy and usage among African women. A substantial proportion of respondents are

What barriers do you/women face in accessing and utilization of AI technologies? (select all that apply)  
20 responses

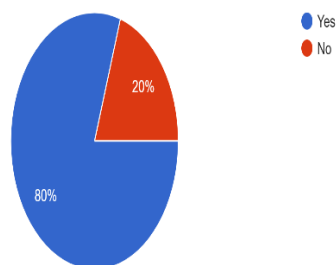


## Gender Dynamics and Power Structures

Understanding the gender dynamics and power structures that affect AI usage is crucial for addressing disparities. Most respondents believe there are gender-specific barriers in accessing AI technologies within their communities.

Do you believe that there are gender-specific barriers to accessing AI technologies in your community?

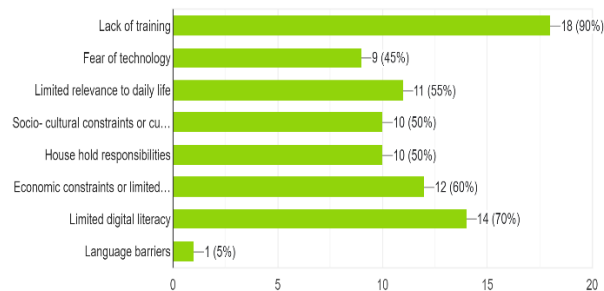
20 responses



These barriers include socio-cultural constraints, household responsibilities, and economic limitations, which disproportionately affect women. The data underscores the importance of considering these dynamics to avoid generalizations and promote a nuanced understanding of the issues.

What barriers do you think women in your community face in utilizing AI technologies? (please select all that apply)

20 responses



## Inclusive Strategies and Policy Recommendations

The survey respondents provided valuable insights into potential strategies to overcome the identified barriers. Training programs and formal education are seen as essential for improving digital literacy and encouraging more women to engage with AI technologies. Financial assistance and community support are also highlighted as crucial enablers. Policy recommendations include implementing inclusive workplace policies, expanding STEM education programs, and ensuring equal access to the internet. These strategies aim to foster an environment where AI can benefit all members of society, regardless of gender.

The findings from this survey reveal that while there is considerable awareness and use of AI technologies among African women, significant barriers remain. Addressing these barriers requires targeted strategies and policies that promote digital literacy, provide financial support, and foster inclusive environments. By understanding and addressing the specific challenges faced by women, it is possible to enhance their access to and utilization of AI technologies, thereby contributing to more equitable and inclusive development across the continent.

## Conclusion

In this comprehensive study, we explored the multifaceted issue of gender disparities in access to and use of artificial intelligence (AI) technologies in Africa. Our research underscores the complexity and urgency of addressing these disparities to foster inclusive development and harness AI's full potential across the continent. The findings

reveal a landscape marked by significant gender gaps in AI literacy, access, and utilization, influenced by a confluence of educational, socio-cultural, and economic barriers. This conclusion synthesizes our key insights and highlights the imperative actions needed to promote gender equity in AI within Africa.

### The Key Findings



#### AI Literacy and Usage Patterns

Our study reveals that AI literacy among African women varies significantly across regions, reflecting disparities in access to education and technological infrastructure. While a substantial proportion of respondents are aware of AI technologies and their applications, the extent of usage is uneven. Daily and weekly engagement with AI is common, particularly in areas related to work, education, and personal use. However, the depth of understanding and the ability to leverage AI for more advanced applications remain limited.

#### Barriers and Challenges

The barriers hindering women's full engagement with AI are multifaceted. Poor internet connectivity and economic constraints are the most frequently cited obstacles, compounded by socio-cultural norms and limited digital skills. These challenges are particularly pronounced in rural areas, where infrastructural deficits further marginalize women. Additionally, traditional gender roles often allocate more household responsibilities to women, limiting their time and opportunities to engage with technology.

#### Gender Dynamics and Power Structures:

The study highlights the critical role of gender dynamics and power structures in shaping AI access and utilization. Socio-cultural norms that prioritize male participation in technology sectors and discourage women from pursuing STEM education are pervasive. These norms, coupled with economic constraints, create a vicious cycle that perpetuates gender disparities. Understanding these dynamics is essential to designing interventions that are culturally sensitive and effective in promoting gender equity.

#### Inclusive Strategies and Policy Recommendations

To mitigate these disparities, the study identifies several strategies and policy recommendations. Educational programs tailored for women, such as coding bootcamps and STEM scholarships, are crucial for building digital literacy. Financial support mechanisms, including subsidies for digital devices and internet services, can alleviate economic barriers. Policy interventions that mandate gender diversity

in technology sectors and promote inclusive workplace environments are also vital. Workplace policies that includes flexible work arrangements, family friendly policies, zero tolerance policies for harassment and discrimination, maternity and childcare policies are all essential for a woman to fully participate in use of AI technologies. Community and corporate initiatives that provide mentorship and support networks can further empower women to navigate and thrive in the AI ecosystem.

## The Path Forward

Addressing gender disparities in AI access and utilization in Africa requires a coordinated and sustained effort across multiple fronts. Here, we outline the essential steps that stakeholders must take to promote a more inclusive and equitable AI landscape.

### 1. Strengthening Educational Pathways

Investing in education is foundational to closing the gender gap in AI. Governments, educational institutions, and NGOs should collaborate to promote STEM education for girls from an early age. This includes revising curricula to make STEM subjects more accessible and appealing, providing scholarships and financial incentives, and creating safe and supportive learning environments. Additionally, targeted educational programs, such as coding bootcamps and AI workshops, should be expanded to reach more women and girls across diverse regions.

### 2. Enhancing Digital Literacy and Skills

Digital literacy is a critical enabler of AI engagement. Training programs should be designed to equip women with the necessary skills to use and develop AI technologies.

These programs should be accessible, affordable, and tailored to the specific needs of women in different contexts. Community-based digital training initiatives can play a significant role in reaching women in rural and underserved areas, helping to bridge the digital divide.



### 3. Addressing Socio-Cultural Barriers:

Challenging and changing socio-cultural norms that discourage women from engaging with technology is essential. This requires a multi-pronged approach that includes public awareness campaigns, community engagement, and advocacy. By promoting positive role models and highlighting the achievements of women in AI, we can inspire more girls and women to pursue careers in technology. Community leaders, educators, and policymakers must work together to create an environment that values and supports women's contributions to the tech sector.

### 4. Providing Financial Support:

Economic barriers significantly limit women's access to AI technologies. Financial support



mechanisms, such as subsidies for digital devices and internet services, can help alleviate these constraints. Additionally, microfinance programs and grants targeted at women entrepreneurs can enable them to invest in AI tools and training. Ensuring that financial resources are accessible to women, particularly in rural and low-income communities, is crucial for fostering inclusive growth.

#### 5. Implementing Policy Interventions

Policy interventions play a vital role in promoting gender equity in AI. Governments should enact and enforce policies that mandate gender diversity in technology companies and research institutions. These policies should include measures to support women's career advancement, such as mentorship programs, leadership training, and flexible working arrangements. Furthermore, regulatory frameworks should ensure that AI technologies are developed and deployed in ways that do not perpetuate gender biases.

#### 6. Fostering Community and Corporate Initiatives

Community-based programs and corporate initiatives that mentor and support women in tech are essential for dismantling barriers to AI engagement. These initiatives should provide mentorship, networking opportunities, and support systems that empower women to navigate and succeed in the technology industry. By fostering inclusive environments and addressing gender biases, community and corporate initiatives can create pathways for women to contribute meaningfully to AI development and innovation.

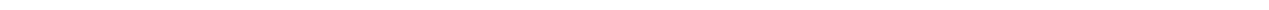
#### 7. Promoting Inclusive AI Development

Ensuring that AI technologies are inclusive and equitable requires a concerted effort to involve diverse voices in their development. Women must be actively involved in the design, development, and deployment of AI systems to ensure that these technologies address the needs and concerns of all users. This includes promoting gender diversity in AI research and development teams, as well as involving women in decision-making processes related to AI governance and regulation.



In summary, the findings of this study highlight the urgent need to address gender disparities in AI access and utilization in Africa. AI is important to every individual and every society. From using mobile phones to increase communication, to using robot vacuums to do house chores and much more, AI access and use is important to every member of a society. By implementing the recommended strategies and policy interventions, stakeholders can create a more inclusive and equitable AI landscape that benefits all members of society.

Promoting gender equity in AI is not only a matter of social justice but also a critical driver of innovation and economic development. By harnessing the full potential of AI and ensuring that women have equal opportunities to participate and thrive in this rapidly evolving field, we can foster a future where AI contributes to sustainable and inclusive development across the continent.



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