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Gender differences in awareness and preparedness for the use of artificial intelligence (AI) in higher education institutions across Sub-Saharan Africa: A Comparative analysis

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Abstract: This study examines gender differences in awareness and preparedness for the use of artificial intelligence in HE institutions across Sub-Saharan Africa. Specifically the study sought to: assess the level of awareness and familiarity with artificial intelligence tools among male and female faculty and students in higher education institutions across Sub-Saharan Africa; compare the levels of preparedness for artificial intelligence use among male and female respondents; identify the institutional and structural factors that influence gendered patterns of artificial intelligence adoption; analyze how gender differences in awareness and preparedness can inform more inclusive and gender-responsive strategies for artificial intelligence integration in higher education. The study was guided by Diffusion of Innovation (DOI) theory and the Gendered Digital Divide framework. A descriptive, cross-sectional survey design was employed, drawing on responses from 314 participants representing universities and technical institutions in Kenya, Malawi, Uganda, Nigeria, and other African countries. Findings revealed that while both genders demonstrate high awareness and positive attitudes toward AI, males reported slightly greater exposure and training opportunities, whereas females exhibited higher confidence in integrating AI into teaching and learning. Nonetheless, persistent disparities in institutional support, access to training, and exposure to emerging technologies constrain equitable adoption. The Gendered Digital Divide framework helps explain these gaps as outcomes of structural and cultural barriers that limit women's participation in digital innovation, while DOI theory contextualizes adoption behavior within stages of diffusion and perceived advantages. The study underscores the importance of gender-responsive digital capacity building and inclusive AI literacy programs that bridge awareness, access, and application gaps. It concludes that addressing gendered barriers is essential for achieving equitable and sustainable integration of AI in higher education across the Sub-Saharan region.

Keywords: self-directed learning; ai training gaps; institutional support deficit; gender disparities; digital confidence; ai familiarity; ethical concerns; informal learning; digital inequality, sub-saharan africa

Highlights

What is already known about this topic:

- Artificial intelligence (AI) rapidly transforming teaching, learning, and research in HE.
- Global AI tool adoption is growing, but remains uneven across Sub-Saharan Africa.
- Previous studies show gender gaps in digital literacy, training access, and confidence in using emerging technologies.

What this study contributes:

- Provides a comparative gender analysis of AI awareness and preparedness among faculty and learners in Sub-Saharan Africa.
- Reveals that while males have greater exposure and training, females show higher confidence and positive attitudes toward AI use.
- Identifies structural and institutional factors such as unequal access to training and limited institutional support that sustain gender disparities in adoption of AI.

Implications for theory, practice, and/or policy:

- Integrates the Diffusion of Innovation theory with the Gendered Digital Divide framework to explain gendered adoption trajectories.
- Highlights the need for gender-responsive digital capacity building and inclusive AI literacy programs in higher education.
- Encourages policymakers and institutions to embed equity and access principles into AI integration strategies and professional development initiatives.



Introduction

Artificial intelligence (AI) is reshaping global higher education, influencing how teaching, learning, and research are designed, delivered, and evaluated (Soko, Pete & Mureithi, 2025; Soko, 2026). Recent meta-review evidence shows that AI in higher education is expanding rapidly, but important gaps remain in ethics, methodological rigor, and representation of diverse stakeholders, including gendered perspectives (Bond et al. 2024)

Tools such as ChatGPT, Grammarly, and Microsoft Copilot have become integral to academic workflows, supporting writing, assessment, tutoring, and research synthesis (Soko, 2025, Soko 2026). Universities worldwide are increasingly integrating AI-driven applications into their systems, signaling a shift toward technology-enhanced learning and data-informed instruction. Yet, this transformation is not evenly distributed. Differences in infrastructure, access, and institutional policy have resulted in unequal adoption trajectories, particularly across developing regions such as Sub-Saharan Africa.

In this region, higher education institutions are navigating complex digital landscapes characterized by limited infrastructure, high connectivity costs, and varying levels of digital literacy. Evidence from African higher education contexts shows that AI familiarity and routine use remain uneven and are constrained by limited internet access, low awareness of tool functionality, and weak institutional guidance (Baidoo & Bondzie, 2025; Soko, Nabwire & Gachanga, 2024). Within these challenges, gender has emerged as a critical dimension influencing technology adoption. Several studies consistently shows that women, despite equal or higher representation in higher education, often face barriers to digital participation due to limited access to resources, fewer training opportunities, and cultural expectations that shape self-efficacy in technology use (UNESCO, 2023; OECD, 2023). These dynamics are reflected in the emerging field of AI adoption, where awareness, confidence, and preparedness to use AI tools may differ significantly by gender. This pattern is supported by evidence from Ghana, where gender significantly predicted students' use of AI-based tools in higher education, with male students reporting higher mean AI use than female students (Ofosu-Ampong, 2023).

Although existing studies (Chafa, & Moyo, 2026; Soko, 2026, Soko, 2025) document growing AI awareness and use in higher education, limited research has examined how awareness and preparedness differ by gender within Sub-Saharan African higher education institutions, especially in relation to institutional support, training access, and structural inequalities. For example, Chafa and Moyo (2026) focus only on Zimbabwe and Soko (2025) and Soko (2026) focuses only on AI awareness without focusing on gender disparity.

Understanding gender differences in AI awareness and preparedness is essential for developing inclusive digital transformation strategies in higher education. Awareness refers to familiarity with AI tools and their functions, while preparedness encompasses the confidence, skills, and institutional support necessary for effective use (Venkatesh & Morris, 2000; UNESCO, 2023; OECD, 2023). Examining these dimensions through a gender lens helps reveal how structural inequalities intersect with innovation diffusion and why gender-responsive strategies are necessary for more equitable participation in AI-enabled higher education.

This study adopts Rogers' (2003) Diffusion of Innovation (DOI) theory and the Gendered Digital Divide Framework (UNESCO, 2023) to analyze how gender influences AI awareness and preparedness among faculty and learners in Sub-Saharan Africa. DOI explains how new technologies spread within a social system through stages of awareness, interest, evaluation, trial, and adoption, emphasizing factors such as perceived advantage, compatibility, and observability. The Gendered Digital Divide framework, on the other hand, highlights persistent structural inequalities such as access, training, and institutional culture that shape men's and women's participation in digital innovation.

By combining these theoretical perspectives, the study aims to reveal how gendered contexts interact with innovation diffusion in higher education. The findings contribute to understanding not only the extent of AI awareness and preparedness among men and women but also the socio-institutional factors that either enable or constrain equitable participation in digital transformation.

The study specifically seeks to:

1. Examine gender differences in awareness and familiarity with AI tools;
2. Compare male and female levels of preparedness, confidence, and training in AI use; and
3. Explore institutional and structural factors influencing gendered patterns of AI adoption.

The article presents a descriptive snapshot of these dynamics across Sub-Saharan African higher education institutions and offers recommendations for building gender-responsive strategies that support equitable AI integration in teaching and learning. Gender-responsive strategies are important for higher education institutions because they help ensure that women and men have equitable access to AI-related training, resources, support, and opportunities, thereby reducing structural barriers, strengthening inclusive participation in digital innovation, and enabling institutions to achieve fairer, more effective, and socially responsive educational transformation. Emerging evidence suggests that AI-integrated learning can support engagement and perceptions of inclusive pedagogy when it is implemented with critical teacher mediation and equity-sensitive design (Silor & Silor, 2026).

Literature

The expansion of artificial intelligence (AI) in higher education has generated extensive scholarship examining its implications for teaching, learning, and academic productivity. Studies consistently document a rapid increase in the visibility of AI tools, particularly generative systems such as ChatGPT, Grammarly, and Copilot, which are used for writing support, content generation, and research assistance (Bond, 2024; Zawacki-Richter et al., 2019). Global policy reports from the OECD (2023) and UNESCO (2023) highlight that AI adoption is advancing in universities worldwide but remains unevenly distributed across regions and demographic groups. While the potential of AI to enhance learning outcomes, personalization, and assessment is widely recognized, disparities in access, skills, and institutional readiness persist, especially in resource-constrained contexts such as Sub-Saharan Africa.

Gender and Technology Use in Higher Education

Gender has long been identified as a significant determinant of technology adoption and digital competence. Recent higher education evidence also shows significant gender differences in perceived AI knowledge, exposure awareness, ability to apply AI, and support for AI development, with female students reporting lower levels on several of these dimensions (Cachero et al., 2025). Research in educational technology shows that women often experience systemic barriers including lower access to digital devices, fewer training opportunities, and sociocultural stereotypes regarding technical expertise that limit their participation in technology-driven innovation (Wajcman, 2004; Faulkner, 2001; UNESCO, 2023). Studies on the digital gender gap reveal that these barriers are magnified in low- and middle-income regions, where institutional support and policy frameworks are underdeveloped. Institutional support remains central to effective digital experiences in African higher education, suggesting that AI preparedness is shaped not only by awareness but by the support ecosystems surrounding learners and staff (Soko, Nabwire, & Gachanga, 2024). As a result, female students and faculty members may be less exposed to emerging technologies and less confident in applying them to academic or professional contexts.

In the African higher education landscape, this gender gap reflects broader patterns of inequality in access to infrastructure, funding, and professional development. For instance, reports from UNESCO (2023) and the African Union (2024) emphasize that despite increased female enrollment in tertiary institutions, women remain underrepresented in STEM-related programs and digital innovation roles.

Such patterns contribute to a cycle where male participants become early adopters and disseminators of technological practices, while female counterparts engage later or depend on institutional mediation to adopt similar tools.

Diffusion of Innovation and Gendered Adoption Patterns

Rogers' (2003) Diffusion of Innovation (DOI) theory provides a valuable framework for understanding how individuals decide to adopt or reject a new technology. Adoption is influenced by perceived relative advantage, compatibility, complexity, trialability, and observability. Studies applying DOI to educational technology demonstrate that awareness and perceived usefulness are early indicators of adoption readiness (Bozkurt & Sharma, 2023a; Göçmez, 2023). However, diffusion occurs unevenly across demographic groups. In gendered contexts, men often dominate the "early adopter" and "early majority" categories due to greater exposure and confidence, whereas women may join later as institutional or peer support increases (Venkatesh & Morris, 2000).

The Gendered Digital Divide framework complements DOI by explaining why these differences persist. It attributes disparities not merely to personal choice but to structural and cultural constraints such as unequal access to digital infrastructure, gendered expectations in academic environments, and biases in technology design that shape how innovations diffuse within social systems (UNESCO, 2023; OECD, 2023). Within Sub-Saharan higher education, these constraints manifest as limited institutional investment in gender-balanced digital training, insufficient mentorship in technology use, and lower representation of women in decision-making roles related to digital strategy.

Gaps in Current Research

While international studies increasingly examine AI in higher education, few explicitly address gender differences in awareness and preparedness. Most analyses focus on pedagogical outcomes, ethical implications, or technological readiness (Bond, 2024; Bozkurt & Sharma, 2024). Comparative studies that explore how men and women differ in AI familiarity, training access, and confidence are particularly scarce in Sub-Saharan contexts. Moreover, existing research often treats gender as a background variable rather than a central analytical dimension, leaving unanswered questions about how social structures and institutional environments shape gendered patterns of AI use.

Positioning of the Current Study

The present study addresses these gaps by combining Diffusion of Innovation theory and the Gendered Digital Divide framework to interpret empirical patterns of AI awareness and preparedness among male and female faculty and learners. This dual-theoretical approach recognizes both the individual decision-making process emphasized by DOI and the structural inequities underscored by the gendered divide. By situating gender differences within a broader socio-technical system, the study contributes context-specific insights into how AI diffusion unfolds in Sub-Saharan African higher education.

Together, the reviewed literature underscores that equitable AI integration requires more than technical familiarity; it depends on inclusive policies, capacity-building initiatives, and institutional cultures that actively support gender equity in digital innovation. This research therefore provides an evidence base for understanding gendered adoption trajectories and for informing strategies that promote balanced participation in AI-driven transformation across higher education institutions.

Theoretical Background

The integration of artificial intelligence (AI) into higher education can be best understood through Rogers' (2003) Diffusion of Innovation (DOI) theory, which explains how new technologies, ideas, or practices spread within a social system over time. According to DOI, adoption depends on five key attributes: relative advantage, compatibility, complexity, trialability, and observability. Individuals and institutions

adopt innovations when they perceive them as advantageous, aligned with existing values and practices, easy to use, testable, and visible in their environment.

In the context of AI in higher education, DOI provides an interpretive lens for examining how faculty and learners progress from awareness to adoption. Male and female participants may differ in their perception of these attributes due to differences in exposure, confidence, and institutional support. For instance, relative advantage may be interpreted through perceived academic efficiency or productivity gains, while compatibility may depend on the alignment between AI tools and teaching or learning habits. Observability the visibility of peers using AI successfully often accelerates adoption. However, when access and participation are unequal, diffusion becomes uneven, reflecting the social context rather than the innovation itself.

To account for these contextual inequalities, the study integrates the Gendered Digital Divide Framework (UNESCO, 2023) alongside DOI. The gendered digital divide conceptualizes technology use as shaped by structural and cultural factors that differentially affect men's and women's access, skills, and opportunities. These differences arise from systemic barriers such as socio-cultural norms, limited exposure to technical training, and underrepresentation of women in digital leadership that hinder women's participation in technology adoption. Consequently, while DOI explains *how* innovations spread, the Gendered Digital Divide framework explains *why* gender disparities persist within that diffusion process.

When combined, the two frameworks offer a comprehensive understanding of gendered AI adoption. DOI situates adoption behavior along a continuum from innovators and early adopters to the late majority and laggards while the Gendered Digital Divide explains why women are often positioned later in this diffusion curve. It emphasizes that gender gaps are not inherent but arise from unequal access to infrastructure, training, and institutional encouragement.

In Sub-Saharan Africa, this theoretical integration is particularly relevant. Structural inequities in access to digital tools, limited investment in gender-balanced capacity building, and varying institutional cultures influence how male and female faculty and learners perceive and engage with AI. Therefore, the present study interprets gender differences in AI awareness and preparedness as outcomes of both individual adoption behavior (DOI) and systemic inequality (Gendered Digital Divide).

This dual-theoretical approach strengthens the study's explanatory power. It acknowledges that gender disparities in AI preparedness are not simply reflections of personal preference or ability but indicators of broader socio-technical dynamics. By situating gender within the diffusion process, the study advances a more inclusive understanding of innovation adoption one that recognizes both behavioral and structural determinants of equitable digital transformation in higher education.

Methodology

Research Model/Design

This study adopted a descriptive, cross-sectional survey design, a method commonly used to collect data from a defined group at a single point in time in order to describe existing conditions, attitudes, perceptions, and behavioral patterns without manipulating any variables. Descriptive survey research is appropriate when the aim is to provide a systematic account of "what exists" in a population, while cross-sectional design enables the researcher to capture a snapshot of such patterns at one particular time (Creswell & Creswell, 2018; Cohen et al., 2018). In the present study, this design was suitable because the objective was not to test an intervention, but to examine and compare current gender-based patterns in awareness and preparedness for using artificial intelligence (AI) in higher education across Sub-Saharan Africa. It therefore allowed the researchers to describe prevailing trends, compare male and female responses, and identify how awareness and preparedness vary across demographic and

institutional categories. Guided by the Diffusion of Innovation (DOI) and Gendered Digital Divide frameworks, the study focused on seven key domains: (a) country and institutional distribution; (b) study level; (c) familiarity with AI tools; (d) confidence in using AI in teaching or learning; (e) exposure to AI-related training; (f) institutional support; and (g) perceptions of opportunities and challenges in AI adoption. The design allowed for both comparative and interpretive analysis to identify gender-linked variations and to contextualize them within broader diffusion and equity frameworks.

Data Collecting Tools

Data were derived from a structured questionnaire administered online through institutional mailing lists and social media platforms. The instrument captured demographic information and responses to items measuring awareness, familiarity, confidence, training, and institutional support for AI use in academic settings. The questionnaire contained closed-ended items measured on a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree), alongside a small number of open-ended prompts for elaboration.

The instrument was adapted from the larger regional AI adoption study (2024) and refined through expert review for clarity, gender sensitivity, and contextual relevance. It was pre-tested with a small pilot group ($n = 20$) to ensure face validity and internal consistency. Ethical considerations were strictly observed: participation was voluntary, responses were anonymous, and no identifying information was collected. Participants were informed of their right to withdraw at any time, and the study followed the principles of the Declaration of Helsinki for research involving human subjects.

Sampling

A non-probability purposive sampling method was used to recruit faculty and learners from universities and technical/vocational institutions across Sub-Saharan Africa. Participants were reached through institutional mailing lists, academic networks, and online professional platforms, making the final sample partly purposive and partly convenience-based, with voluntary participation. The study population comprised faculty and learners from universities and technical/vocational institutions across Sub-Saharan Africa. A total of $N = 314$ valid responses were analyzed, including 165 males (53%) and 149 females (47%). Respondents represented Kenya, Malawi, Uganda, Nigeria, Ghana, Eswatini, Cameroon, and the Democratic Republic of Congo, reflecting diverse higher education contexts in the region.

Institutional representation included public universities (67%), private universities (33%), and a smaller proportion from technical and vocational institutions. By study level, 81% of learners were undergraduates and 19% postgraduates. Sampling was non-probability and purposive, relying on accessibility and voluntary participation. While this limits statistical generalization, it provides rich descriptive data suitable for comparative gender analysis.

Data Analysis

Quantitative data were analyzed using descriptive statistics (frequencies and percentages) to summarize gender differences across all variables. The analysis focused on identifying patterns of awareness, confidence, training exposure, and institutional support between males and females. Comparative trends were visually summarized in frequency tables and charts.

Qualitative comments from open-ended responses were coded thematically following Braun and Clarke's (2006) six-step process familiarization, coding, theme generation, review, naming, and reporting. Two coders independently analyzed the data, and discrepancies were resolved through consensus to enhance inter-coder reliability. These qualitative insights were used to complement quantitative results, especially in explaining underlying perceptions and experiences influencing gender differences.

Validity and Reliability

Reliability was strengthened through multiple strategies: (a) use of standardized question wording across items; (b) cross-verification of data consistency across gender groups; and (c) independent coder review of qualitative responses. The pilot test confirmed acceptable internal consistency, and cross-tabulations between awareness and preparedness indicators revealed coherent patterns supporting construct validity.

Limitations include reliance on self-report data, which may introduce subjectivity or social desirability bias, and non-probability sampling, which restricts generalizability. However, the use of clearly defined variables, transparent coding, and triangulation of quantitative and qualitative data enhance descriptive accuracy and analytical robustness.

Ethical Considerations

Ethical approval was obtained from the host institution's research ethics committee. Participants provided informed consent before accessing the survey link. No personal identifiers were collected, ensuring confidentiality and compliance with data protection principles.

Findings and Discussions

1. Gender Differences in Awareness and Familiarity with AI Tools

The first objective sought to determine gender differences in awareness and familiarity with AI tools such as ChatGPT, Bard, and Microsoft Copilot. Respondents were asked to rate their familiarity on a five-point scale ranging from "Not familiar at all" to "Very familiar." Table 1 summarizes the comparative findings.

Table 1: Gender Comparison on Familiarity with AI tools

Level of Familiarity	Male (n = 152)	Female (n = 141)	Interpretation
Not familiar at all – never heard of them	2.6 %	1.4 %	Very few in either group are unaware of AI; females slightly fewer with zero exposure.
Not very familiar – know very little	9.9 %	5.7 %	A higher share of males reported minimal awareness.
Somewhat familiar – heard but not used	3.9 %	13.5 %	Females more likely to have heard but not practiced, indicating surface-level exposure.
Familiar – some experience with them	55.9 %	50.4 %	Majority in both groups have moderate experience.
Very familiar – use them regularly	27.6 %	29.1 %	Regular use is comparable, with females slightly higher.
Total Familiar or Very Familiar	83.5 %	79.5 %	Both genders demonstrate high awareness overall.

The results indicate high familiarity with AI tools across both genders, with 83.5% of male respondents and 79.5% of female respondents reporting that they were either familiar or very familiar with these tools. This shows that more than three-quarters of both male and female participants had already attained a substantial level of awareness and practical familiarity with AI. This pattern is consistent with recent higher education research showing that AI tools have rapidly become visible and widely encountered in academic environments, even where formal institutional support remains uneven (Bond et al., 2024; OECD, 2023; Soko, 2025; Soko, Pete, Mureithi, 2025). The finding also aligns with studies from diverse contexts showing that awareness of AI often spreads faster than structured capacity-building, making familiarity an early indicator of diffusion rather than of full preparedness (Zawacki-Richter et al., 2019; UNESCO, 2023). However, the gender pattern within the familiarity categories is more nuanced. Male respondents were slightly more represented among those reporting minimal

awareness, but female respondents were more strongly represented in the “somewhat familiar” category, suggesting that a notable proportion of women had encountered AI tools but had not yet moved into regular or confident use. This pattern resembles findings from recent higher education studies showing that women are often present in the AI adoption space but may report lower exposure, lower perceived technical knowledge, or more cautious engagement than men (Cachero et al., 2025; Møgelvang et al., 2024; Matobobo, 2026). At the same time, the near parity in the “very familiar” category suggests that once access is achieved, women are equally capable of becoming active AI users (Silor & Silor, 2026; Matobobo, 2026).

From the perspective of Diffusion of Innovation (DOI), the high proportions in the “familiar” and “very familiar” categories suggest that AI has already reached a visible and socially recognizable stage of adoption in higher education, where observability and perceived relative advantage are driving broader uptake (Rogers, 2003). In other words, AI tools are no longer confined to a small group of innovators; they are increasingly part of mainstream academic awareness across gender groups. Yet DOI alone does not fully explain why female respondents remain more visible in the “heard but not used” category. To interpret that pattern, the Gendered Digital Divide framework is useful because it highlights how structural inequalities in access, participation, mentoring, and confidence formation can affect how quickly different groups move from awareness to regular use (Faulkner, 2001; Wajcman, 2004; UNESCO, 2023). This interpretation is also supported by African and international higher education literature. In Ghana, gender was found to significantly influence students’ use of AI-based tools, with male students reporting higher mean use and more favorable innovation-related perceptions (Ofosu-Ampong, 2023). In Spain, female students reported lower levels of perceived AI knowledge, exposure awareness, and support for AI development than male students (Cachero et al., 2025). Similarly, a Norwegian study found that male students used generative AI chatbots more frequently and across broader purposes, while women showed more cautious patterns of use and stronger concern about responsible engagement (Møgelvang et al., 2024). Against this comparative background, the present findings suggest that Sub-Saharan African higher education is following a broadly similar diffusion pattern, but with encouraging signs that women are achieving active familiarity at levels close to men once exposure is established (Matobobo, 2026).

Overall, this finding suggests that awareness of AI is no longer the main barrier for either gender. Rather, the more important issue is how learners and faculty move from basic familiarity to sustained and confident academic use. This implies that institutions should focus less on introducing AI as a new concept and more on creating structured, gender-responsive pathways for practice, support, and inclusive participation (OECD, 2023; UNESCO, 2023; Silor & Silor, 2026).

2. Gender Differences in Confidence and Preparedness to Integrate AI in Teaching and Learning

The second objective examined the extent to which male and female participants feel confident and prepared to integrate AI tools into their teaching and learning processes. This dimension reflects both self-efficacy and readiness to apply AI for academic purposes key determinants of diffusion according to Rogers’ (2003) model. Table 2 presents the comparative findings.

Table 2: Gender Comparison on Confidence in Integrating AI into Teaching/Learning

Confidence Level	Male (n = 149)	Female (n = 138)	Interpretation
Disagree	10.1 %	10.1 %	Equal proportions of males and females express low confidence.
Not sure	14.8 %	13.8 %	Uncertainty remains moderate and similar across genders.
Agree	45.6 %	50.7 %	A higher proportion of females report confidence in using AI tools.
Strongly agree	29.5 %	25.4 %	More males express very high confidence, showing stronger top-end self-assurance.
Total Agree/Strongly Agree	75.1 %	76.1 %	Overall, both genders report strong confidence, with a marginal female lead.

The findings indicate that confidence in integrating AI into teaching and learning is high among both male and female respondents, with 75.1% of males and 76.1% of females reporting agreement or strong agreement. This shows that more than three-quarters of both groups feel prepared to use AI tools in academic practice. This suggests that perceived preparedness for academic AI use is already fairly widespread among participants, even in contexts where formal institutional support may still be limited as supported by (Bond et al., 2024; UNESCO, 2023; Nabwire, Soko & Gachanga, 2024). The result also supports the broader view that confidence in AI adoption is increasingly emerging as a practical academic issue rather than a purely technical concern, especially in higher education settings where AI tools are becoming embedded in routine learning tasks (OECD, 2023; Zawacki-Richter et al., 2019).

At the same time, the gender pattern within the confidence categories reveals an important nuance. Female respondents recorded a slightly higher overall level of agreement, while male respondents were somewhat more represented in the “strongly agree” category. This suggests that both groups are broadly confident, but they may express that confidence somewhat differently. Women appear to show steady and consistent confidence in using AI for academic purposes, whereas men appear slightly more likely to express very high or top-end self-assurance. This pattern is consistent with recent higher education studies showing that gender differences in AI engagement often emerge not in whether users value the technology, but in how confidently and expansively they report their use of it (Cachero et al., 2025; Møgelvang et al., 2024; Matobobo, 2026).

Importantly, the findings do not support the view that women are less prepared to integrate AI into teaching and learning. On the contrary, the slightly higher total agreement among female respondents suggests that women are at least equally ready, and in some respects slightly more prepared, to incorporate AI into academic work when considering the broader confidence range rather than only the most assertive response category. This interpretation resonates with recent studies showing that female students and educators may not always report the highest level of technical self-assertion, yet they often demonstrate strong readiness to use AI where it is connected to pedagogical value, collaborative learning, or academic efficiency (Silor & Silor, 2026; UNESCO, 2023).

From the perspective of Diffusion of Innovation, these results suggest that both genders have moved beyond simple awareness into a stage where AI is considered usable, relevant, and beneficial in day-to-day academic practice. In DOI terms, this reflects the influence of relative advantage, compatibility, and trialability, since confidence tends to increase when users perceive AI as helpful, relevant to their tasks, and sufficiently accessible for experimentation (Rogers, 2003). The high agreement levels therefore suggest that many respondents are no longer merely observing AI as an emerging innovation, but are beginning to internalize it as a workable academic tool.

However, confidence should not be confused with fully equal conditions of adoption. The Gendered Digital Divide framework helps explain why similar confidence levels may still coexist with different underlying experiences of access, support, and digital opportunity. Even where women report strong readiness, their pathways into confidence may still be shaped by institutional encouragement, collaborative learning, or compensatory self-directed strategies rather than by equal access to formal training or technical networks (Faulkner, 2001; Wajcman, 2004; UNESCO, 2023). This means that comparable confidence scores do not automatically imply that structural inequalities have disappeared; rather, they may indicate that users are adapting successfully despite unequal support systems.

Comparative evidence from other contexts reinforces this interpretation. In Norway, Møgelvang et al. (2024) found that male students reported more frequent and broader use of generative AI chatbots, while women expressed more reflective and cautious engagement, especially around trust and responsible use. In Spain, Cachero et al. (2025) reported that female students had lower perceived AI knowledge and lower confidence in applying AI, despite participating actively in the same educational environment. In Ghana, Ofosu-Ampong (2023) found that gender significantly influenced AI tool use and

innovation-related perceptions in higher education. Against this international background, the present findings are notable because they show that in the Sub-Saharan African context, female respondents are not trailing behind in perceived preparedness; rather, they display confidence levels very close to, and in total terms slightly above, those of male respondents (Ofosu-Ampong, 2023; Matobobo, 2026).

This result has important implications for institutional policy and capacity building. If confidence is already high across gender groups, then the next challenge is not simply introducing AI awareness, but ensuring that confidence is translated into effective, ethical, and sustained academic use. Recent policy and research literature stresses that this transition depends on structured support, practical training, institutional guidance, and inclusive digital ecosystems rather than on individual interest alone (Bond et al., 2024; OECD, 2023; UNESCO, 2023). In this sense, preparedness is not just a matter of personal willingness; it is strengthened when institutions provide equitable conditions for experimentation, support, and pedagogical integration.

Overall, the findings suggests that both men and women in Sub-Saharan African higher education are already positioned to engage meaningfully with AI in teaching and learning. The slight differences in response pattern do not point to a major confidence gap, but rather to different styles of expressing preparedness. The broader implication is that gender-responsive institutional strategies remain important not because women lack confidence, but because equitable support structures are needed to ensure that confidence develops into sustained and inclusive practice across all groups (Silor & Silor, 2026; OECD, 2023; UNESCO, 2023).

3. Gender Differences in AI Training Exposure and Institutional Support

The third objective sought to examine whether male and female faculty and learners differ in terms of training exposure and institutional support for the use of AI in higher education. These dimensions are crucial indicators of preparedness and serve as enabling conditions for sustained innovation diffusion. Table 3 summarizes the comparative results.

Table 3: Gender Comparison on AI Training Exposure and Institutional Support

Statement	Male (%)	Female (%)	Interpretation
“I have received training on how to use AI tools in an academic setting.”			
Disagree	46.6	52.1	More females reported lack of training opportunities.
Not sure	16.2	14.3	Comparable uncertainty across genders.
Agree	27.7	23.6	Slightly higher training participation among males.
Strongly agree	9.5	10.0	Nearly equal high-end training exposure.
Total Agree/Strongly Agree	37.2	33.6	Males slightly more likely to have received formal AI training.
“My institution provides adequate support in learning and using AI tools.”			
Disagree	44.2	37.3	Both groups report inadequate institutional support; males slightly more dissatisfied.
Not sure	25.2	32.8	More females are uncertain about available support.
Agree	23.1	24.6	Similar modest institutional support reported.
Strongly agree	7.5	5.2	Limited strong satisfaction in both groups.
Total Agree/Strongly Agree	30.6	29.8	Both groups perceive institutional support as insufficient.

The findings indicate that both male and female respondents have limited exposure to structured AI training and perceive institutional support for AI integration as inadequate. Only about one-third of the respondents reported having received any form of formal training, with males (37.2%) showing only a slight advantage over females (33.6%) in training exposure. Female respondents also reported

somewhat greater uncertainty about institutional support, suggesting that available opportunities, guidance, or resources may not be sufficiently visible, accessible, or well communicated. These patterns suggest that AI adoption in the sampled institutions is occurring under conditions of weak formal scaffolding, where users are becoming aware of and experimenting with AI tools without a correspondingly strong institutional support system (Bond et al., 2024; UNESCO, 2023; Nabwiere, Soko, Gachanga, 2024; Soko, 2025).

This finding aligns with broader recent research showing that one of the main barriers to effective AI integration in higher education is not lack of interest, but lack of structured preparation. OECD (2023) and UNESCO (2023) both emphasize that equitable digital transformation depends on professional development, institutional policy, digital infrastructure, and support mechanisms that enable both faculty and learners to use AI responsibly and effectively. Similarly, Bond et al. (2024) argue that although AI activity in higher education is expanding rapidly, institutional rigor, coordinated implementation, and inclusive support systems remain underdeveloped. In this sense, the present findings reflect a familiar pattern in which enthusiasm for AI outpaces the institutional capacity needed to guide its use in systematic and equitable ways (Bond et al., 2024; OECD, 2023; UNESCO, 2023).

From the perspective of Diffusion of Innovation, training plays a critical role in helping users move from awareness and trial to implementation and confirmation. When users receive structured opportunities to learn, test, and apply an innovation, the innovation becomes more compatible with everyday practice and less dependent on uncertainty or informal experimentation (Rogers, 2003). The limited training exposure reported in this study therefore suggests that many respondents may still be situated in an early phase of diffusion, where AI use is exploratory, self-directed, and inconsistently supported. This means that adoption may appear widespread at the level of visibility and interest, while still remaining shallow in terms of pedagogical integration, critical literacy, and sustainable institutional uptake (Rogers, 2003; Zawacki-Richter et al., 2019).

The gender pattern in these findings is also important. Although the difference in formal training exposure between males and females is small, it still reflects a broader concern raised in the literature: that women often participate in digital transformation under slightly less favorable support conditions. The Gendered Digital Divide framework helps explain that even modest differences in access to training, information, mentorship, and technical opportunity can accumulate over time and shape unequal preparedness outcomes. In this view, the issue is not simply whether training exists, but who is most likely to hear about it, access it, feel welcomed into it, and benefit from it fully (Faulkner, 2001; Wajcman, 2004).

Recent studies in higher education support this interpretation. Ofosu-Ampong (2023) found that students' use of AI-based tools was strongly shaped by technology familiarity, internet access, AI use experience, and innovation-related perceptions, all of which point to the importance of exposure and support conditions. Møgelvang et al. (2024) similarly found that male students used generative AI tools more frequently and across broader domains, while women's use patterns reflected more caution and the need for responsible engagement. Cachero et al. (2025) reported that female students showed lower perceived AI knowledge, lower exposure awareness, and lower confidence in applying AI than males in the same educational setting. Taken together, these studies suggest that gender differences in AI preparedness are often linked not to ability, but to the quality and quantity of learning opportunities and support systems surrounding adoption (Cachero et al., 2025; Møgelvang et al., 2024; Ofosu-Ampong, 2023).

Low institutional support further intensifies this challenge. Institutional readiness includes not only access to infrastructure, but also leadership commitment, clear policy direction, staff development, ethical guidance, and visible support pathways for users. Where these conditions are weak, AI adoption tends to become individualized and fragmented rather than coordinated and sustainable. The present findings suggest that this is the case in many of the participating institutions, where both male and female

respondents appear to rely heavily on self-motivation and informal learning channels rather than institutionally organized support. This interpretation is consistent with recent literature arguing that without coherent institutional strategy, AI integration in higher education risks becoming uneven, unsupervised, and inequitable (Bozkurt & Sharma, 2024; Bond et al., 2024; OECD, 2023).

The slightly greater uncertainty reported by female respondents regarding institutional support deserves particular attention. This may indicate that support structures are not equally visible or equally inclusive across gender groups, even when formally available. In other words, uncertainty itself can be interpreted as an indicator of institutional disconnect: users may not know whether support exists, how to access it, or whether it is intended for them. This is precisely why gender-responsive capacity-building matters. It is not enough for institutions to offer generic training; they must also ensure that communication, design, timing, mentoring, and follow-up mechanisms are inclusive and responsive to different user experiences (UNESCO, 2023; Silor & Silor, 2026).

Overall, the findings under Objective 3 show that enthusiasm and confidence in AI use are developing faster than formal institutional readiness. Both men and women are engaging with AI in higher education, but they are doing so within systems where training opportunities remain limited and institutional support is weak. The broader implication is that equitable AI preparedness cannot be achieved through self-driven experimentation alone. It requires deliberate investment in structured training, inclusive institutional policy, leadership commitment, and support systems that reduce gendered disparities in access and participation (OECD, 2023; UNESCO, 2023; Bond et al., 2024).

4. Gender Differences in Perceived Opportunities and Challenges of AI Use

The fourth objective examined gender-based perceptions of opportunities and challenges associated with the integration of AI in higher education. Understanding how males and females interpret AI's benefits and risks offers insight into the motivational and ethical dimensions of adoption behavior. Two items from the dataset captured these perceptions: (a) whether AI presents more opportunities than risks, and (b) whether ethical concerns limit AI use. Table 4 summarizes the results.

Table 4: Gender Comparison on Perceived Opportunities and Ethical Concerns of AI Use

Statement	Male (%)	Female (%)	Interpretation
"AI presents more opportunities than risks in improving teaching and learning."			
Disagree	5.3	6.8	Minimal disagreement in both groups.
Not sure	17.3	18.9	Slightly more uncertainty among females.
Agree	45.1	47.7	High agreement across both genders, showing optimism toward AI.
Strongly agree	32.3	26.5	Males slightly more likely to strongly affirm AI's positive role.
Total Agree/Strongly Agree	77.4	74.2	High perceived opportunity for both genders.
"Ethical concerns (e.g., bias, data privacy) limit the use of AI in education."			
Disagree	5.3	11.5	More females downplay ethical risks.
Not sure	18.0	21.4	Slightly higher uncertainty among females.
Agree	49.6	42.7	Males perceive more ethical challenges.
Strongly agree	27.1	24.4	High awareness of ethical limitations in both groups.
Total Agree/Strongly Agree	76.7	67.1	Males express stronger concern about ethical risks.

The findings show that both male and female respondents overwhelmingly perceive AI as offering more opportunities than risks for teaching and learning. More than 70% of each group agreed or strongly agreed with this statement, indicating broad optimism and a shared recognition of AI's potential to

improve efficiency, enhance feedback, and expand access to information. This result is consistent with recent higher education research showing that students and educators increasingly value AI for its practical academic benefits, particularly in supporting productivity, information access, and learning assistance (Bond et al., 2024; Zawacki-Richter et al., 2019). It also reflects a wider global trend in which AI is becoming normalized as a useful educational tool, even in contexts where governance and support systems remain underdeveloped (OECD, 2023; UNESCO, 2023).

At the same time, the findings reveal an important gendered nuance in perceptions of ethical concern. Male respondents (76.0%) were more likely than female respondents (67.1%) to agree that issues such as data bias, privacy, and plagiarism risks constrain AI adoption. This suggests that although both groups recognize AI's opportunities, they do not engage with its challenges in exactly the same way. However, this difference should be interpreted carefully. It does not necessarily mean that women are less ethically aware; rather, it may indicate that male and female respondents encounter different dimensions of AI in practice and therefore emphasize different kinds of concern. Recent literature supports this more nuanced reading, showing that gender differences in AI perception often reflect differences in experience, context of use, and forms of engagement rather than simple differences in concern or ability (Møgelvang et al., 2024; Matobobo, 2026).

One possible explanation is that male respondents may be more exposed to technical, research-oriented, or experimental uses of AI, where issues of bias, data privacy, and originality are more visible. Female respondents, by contrast, may be engaging with AI more through pedagogical, communicative, or collaborative applications, where the immediate educational benefits are more salient than the technical risks. This interpretation is broadly consistent with recent higher education studies. Møgelvang et al. (2024) found that men reported broader and more frequent use of generative AI tools, while women's engagement was often more reflective and cautious, with stronger emphasis on appropriate use and critical judgment. Matobobo (2026) similarly notes that male students often report higher confidence and use frequency, whereas female students tend to express more concern about trust, transparency, and guided support. The present study therefore adds to this literature by suggesting that gendered ethical perceptions may be shaped not only by awareness of risk, but by the specific forms of AI interaction that users encounter in academic life (Møgelvang et al., 2024; Matobobo, 2026).

From the perspective of Diffusion of Innovation, the strong optimism expressed by both genders reflects the role of perceived relative advantage and compatibility in supporting adoption. AI is being viewed as useful, relevant, and aligned with important academic needs such as efficiency, clarity, and access to information. These qualities make the innovation more attractive and more likely to diffuse across the higher education system (Rogers, 2003). At the same time, the variation in ethical concern suggests that diffusion is not uniform across subgroups. Users enter the adoption process from different social and professional positions, and these positions influence which benefits and risks become most visible to them.

The Gendered Digital Divide framework deepens this interpretation by showing that differences in ethical concern may also reflect differences in digital literacy, confidence, and depth of technological exposure. Users who have more interaction with AI systems, more opportunities to test them, or more technical familiarity may become more alert to issues such as algorithmic bias, privacy, and misuse. Others may engage more at the level of application and practical usefulness without having the same degree of visibility into the system's underlying risks. In this sense, gender differences in ethical perception are not simply about who knows more, but about how access, learning opportunities, and institutional culture shape the kinds of AI knowledge different users develop (Faulkner, 2001; Wajcman, 2004; UNESCO, 2023).

These findings are also consistent with the wider literature on trust, transparency, and responsible AI adoption in education. Bozkurt and Sharma (2024) argue that trust, credibility, and transparency are

central to the sustainable integration of AI in educational systems. Likewise, Bond et al. (2024) emphasize that the expansion of AI in higher education must be matched by stronger attention to ethics, rigor, and institutional responsibility. The present findings support this view by showing that confidence in AI's usefulness does not remove the need for ethical literacy. On the contrary, as adoption grows, ethical understanding becomes even more important for ensuring that AI use is responsible, balanced, and pedagogically sound (Bond et al., 2024; Bozkurt & Sharma, 2024; Soko, 2025).

The gender difference observed here therefore has practical implications for higher education institutions. If male and female users are encountering AI's opportunities and risks through somewhat different pathways, then institutions should not assume that a generic awareness campaign will be sufficient. Instead, there is a need for inclusive ethical literacy programs that combine practical AI skills with critical understanding of privacy, bias, authorship, accountability, and responsible academic use. Such programs are especially important in contexts where AI adoption is progressing faster than institutional policy development, as is increasingly the case in many higher education systems (OECD, 2023; UNESCO, 2023).

Overall, the findings under this objective suggest that optimism toward AI is widespread and largely shared across gender groups, but ethical perception remains differentiated by context, exposure, and experience. The broader implication is that successful AI integration in higher education requires not only promoting awareness of benefits, but also building inclusive forms of ethical understanding so that both men and women are equally informed, critical, and empowered in their use of AI tools (Bond et al., 2024; UNESCO, 2023; OECD, 2023).

5. Gender Differences in Proactive Learning Behaviors and Self-Initiated AI Skill Development

The fifth objective explored whether male and female respondents differed in their proactive efforts to build AI-related knowledge and skills. This variable captures individual motivation an essential driver of sustained adoption within the Diffusion of Innovation (DOI) process and reflects how learners and faculty take initiative to bridge institutional or training gaps. Table 5 presents the comparative results.

Table 5: Gender Comparison on Self-Initiated AI Learning and Skill Development

Statement	Male (%)	Female (%)	Interpretation
"I actively seek out resources to improve my AI skills and knowledge."			
Disagree	10.8	12.2	Comparable low disengagement across both genders.
Not sure	8.1	10.8	Slightly higher uncertainty among females.
Agree	48.6	47.5	Majority of both genders report active learning engagement.
Strongly agree	32.4	29.5	High proactive learning in both groups; males slightly ahead.
Total Agree/Strongly Agree	81.0	77.0	Strong self-motivation across genders with minimal gap.

The findings show that both male (81%) and female (77%) respondents demonstrate high levels of self-directed learning in AI, with more than three-quarters of each group actively seeking resources to expand their knowledge. This points to a strong culture of digital curiosity, experimentation, and informal learning within Sub-Saharan African higher education. The result is especially significant because it suggests that AI learning is not being driven only by institutional programs, but also by users' own efforts to explore tools, observe peer practices, and build competence through independent engagement (Bond et al., 2024; OECD, 2023).

Male respondents reported slightly higher proactive engagement in self-learning than female respondents, but the margin was relatively small. This suggests that while men may still retain a modest advantage in digital participation, women are also actively engaging in independent pathways of AI learning. Rather than indicating a major gender divide in motivation, the findings point to a shared willingness across both groups to pursue AI competence even when formal opportunities are limited (UNESCO, 2023; Matobobo, 2026). This is an encouraging finding because it suggests that women are not passively excluded from AI development spaces, but are increasingly using online materials, peer exchange, and self-paced exploration to strengthen their participation (Silor & Silor, 2026; UNESCO, 2023).

From the perspective of Diffusion of Innovation, this pattern reflects the importance of trialability and observability in the adoption process. Users are not only hearing about AI tools; they are experimenting with them, observing their usefulness in the practices of peers, and gradually deepening their engagement through continued self-learning. This suggests that both genders are moving beyond simple awareness toward a more active phase of diffusion in which AI is being tested, adapted, and integrated into academic routines (Rogers, 2003). Self-directed learning therefore appears to function as a bridge between early familiarity and more sustained utilization, especially where institutional guidance is weak (Nabwire, Soko, Gachanga, 2024).

The Gendered Digital Divide framework adds another layer to this interpretation. Self-learning is not always simply a matter of personal preference; it can also be a compensatory strategy adopted when formal systems of support are uneven or insufficient. In this sense, women's strong participation in self-directed learning may reflect resilience and adaptation within environments where access to formal training, mentorship, or technical communities is still less assured. The issue is therefore not only that women are learning independently, but that they may be doing so under more constrained institutional conditions (Faulkner, 2001; Wajcman, 2004; UNESCO, 2023).

This interpretation is consistent with recent literature on AI and digital learning in constrained educational contexts. Bozkurt and Sharma (2024) emphasize that in rapidly changing digital environments, learners often rely on self-paced, community-supported, and flexible modes of engagement to build emerging competencies. Bond et al. (2024) similarly note that the spread of AI in higher education often exceeds the pace of formal institutional preparation, leaving many users to develop their knowledge through informal experimentation. The present findings fit this pattern closely, suggesting that self-directed learning is becoming a crucial mechanism through which both men and women respond to the opportunities and gaps associated with AI diffusion (Bozkurt & Sharma, 2024; Bond et al., 2024).

At the same time, self-learning should not be romanticized as a complete substitute for institutional readiness. Independent exploration can build awareness and practical familiarity, but on its own it may not ensure critical literacy, ethical understanding, pedagogical depth, or sustained academic integration. Without mentorship, feedback, and structured support, self-acquired knowledge may remain fragmented, uneven, or disconnected from institutional standards and policy expectations (OECD, 2023; UNESCO, 2023). This is especially important in the context of AI, where effective use requires not only technical know-how, but also ethical judgment, academic integrity, and context-sensitive pedagogical application (Bond et al., 2024; Bozkurt & Sharma, 2024).

The findings therefore have important implications for higher education institutions. The strong motivation shown by both male and female respondents is a major asset for AI integration, but it should be built upon rather than taken for granted. Institutions need to recognize and support self-acquired competencies through structured mentorship, practical workshops, peer learning communities, and inclusive training opportunities that convert informal learning into sustained institutional capacity. Gender-responsive strategies are particularly important here, because they ensure that women's self-directed engagement is supported as a pathway of growth rather than left as a compensatory response to unequal access (Silor & Silor, 2026; UNESCO, 2023).

Overall, the findings under this objective suggest that self-directed learning has become a significant driver of AI preparedness in Sub-Saharan African higher education. Both men and women are showing strong motivation to learn, experiment, and adapt. However, the broader implication is that equitable AI development cannot rely on self-learning alone. To ensure that self-directed effort complements rather than replaces institutional responsibility, higher education systems must invest in inclusive training, structured support, and policy frameworks that reduce gendered disparities in access and opportunity (OECD, 2023; UNESCO, 2023; Bond et al., 2024).

Conclusion and Recommendations

This study set out to examine gender differences in awareness, preparedness, and perceptions of artificial intelligence (AI) use in higher education institutions across Sub-Saharan Africa. Using Rogers' (2003) Diffusion of Innovation (DOI) theory and the Gendered Digital Divide framework, it analyzed comparative patterns of familiarity, confidence, training, institutional support, and perceived opportunities among male and female faculty and learners.

Results show that both genders exhibit high awareness and positive attitudes toward AI, signaling that diffusion has progressed beyond the early awareness phase. However, training and institutional support remain limited, constraining the deep integration of AI into teaching and learning. Male respondents reported marginally higher exposure and training opportunities, while females demonstrated stronger confidence and proactive learning behaviors once access barriers were overcome. These results highlight that gender differences are not rooted in motivation or ability but in structural inequalities of access, training, and institutional inclusion. This interpretation is consistent with both the Diffusion of Innovation framework, which explains how AI is spreading through higher education, and the Gendered Digital Divide framework, which shows why that diffusion remains uneven across groups.

Through the DOI lens, both men and women can be viewed as part of the early majority phase of adoption, where perceived usefulness, visibility, and practical value encourage continued experimentation and gradual uptake. Yet the Gendered Digital Divide framework reveals that systemic factors such as unequal access to capacity-building opportunities, limited institutional support, and gendered academic cultures continue to shape who benefits most from this diffusion. In this sense, the study confirms that technological adoption alone does not guarantee equitable transformation. As Soko et al. (2012) argue in *Management for Social Transformation*, meaningful transformation requires deliberate efforts to address the social, institutional, and structural conditions that shape participation, empowerment, and inclusion. The integration of AI in higher education must therefore be understood not only as a technical process, but also as a social transformation issue requiring justice-oriented institutional change.

Practically, these findings call for gender-responsive digital transformation strategies in higher education. Institutions should intentionally:

1. Integrate gender equity into AI capacity-building programs, ensuring balanced access to training, mentorship, and digital tools for both faculty and students.
2. Strengthen institutional support structures by embedding AI literacy into professional development, course design, and administrative planning.
3. Develop ethical and inclusive AI policies that address data privacy, bias, and responsible use while reflecting gender perspectives in decision-making.
4. Encourage self-learning ecosystems through the recognition of informal learning, peer mentorship, and open educational resources, while ensuring that these informal pathways complement rather than replace formal and equitable access to structured support.
5. Promote regional collaboration aligned with the African Union's Continental AI Strategy to harmonize gender inclusion within digital innovation policies and advance more inclusive, ethical, and sustainable AI-enabled higher education systems.

The study contributes to theory by demonstrating that while the DOI framework explains *how* AI spreads within higher education, the Gendered Digital Divide framework explains *why* adoption remains uneven across genders. Together, they reveal that equitable diffusion requires both enabling environments and structural transformation.

Future research should expand this comparative analysis across disciplines, explore longitudinal adoption trends, and assess the impact of gender-inclusive interventions on sustained AI use. By fostering equal access, participation, and representation, higher education institutions in Sub-Saharan Africa can advance toward a more inclusive, ethical, and sustainable AI-driven academic ecosystem.

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Jeketule Soko: Conceptualization, methodology, formal analysis, investigation, data curation, visualization, writing—original draft preparation, writing—review and editing; Judith Pete; supervision, project administration, writing—original draft preparation; Grace Mureithi; writing—review and editing. Violet Opat Nabwire. All authors have read and agreed to the published version of the manuscript.

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Data Accessibility Statement

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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