IJEIR
International Journal of Educational Innovation and Research
Volume 4, Number 1, 2025, pp. 100-111
DOI: https://doi.org/10.31949/ijeir.v4i1.11717
ISSN: 2810-0808

Gender Differences in the Adoption, Usage, and Perceived Effectiveness of AI Writing Tools: A Study Among University for Development Studies Students

Hassan Mubarik Iddrisu*, Simon Alhassan Iddrisu, Bashiru Aminu
University for Development Studies, Tamale, Ghana
*Corresponding Author: ih.mubarik@yahoo.com

ABSTRACT
The purpose of this paper is to investigate gender differences in the adoption, use patterns and perceived effectiveness of AI writing tools by undergraduate students at the University for Development Studies (UDS). In light of the rapid adoption of AI tools into the landscape of higher education, it is important to examine male and female students as they relate to the usage and perceptions of AI in higher education. This study employs the Technology Acceptance Model (TAM) as a theoretical framework to explore how factors such as perceived ease of use, perceived usefulness, and attitudes toward technology influence AI adoption and usage patterns. A cross-sectional survey design was used for data collection using a structured questionnaire from 320 students across three departments. Statistical analyses (including t-tests and chi-square tests) were used to examine differences by gender. More than three-fourths (76.9%) of student respondents reported the use of AI tools, while 31.6% reported daily use. No significant differences were found between male and female students on perceived effectiveness, and both male and female students perceived AI tools as being effective. Results demonstrate the comorbid use of artificial intelligence in the academic writing context and imply that any gender differences in AI output are mitigated by the supportive capabilities of AI tools. The study's implications highlight the need for educators to provide equitable access and training in AI tools to support diverse student needs. Policymakers and developers should focus on designing inclusive AI writing tools that address potential barriers, ensuring all students benefit equally from technological advancements in education.

ARTICLE HISTORY
Received 2024-11-03
Accepted 2025-01-23

KEYWORDS
Adoption
Gender Difference
Effectiveness
Artificial Intelligence
Higher Education

INTRODUCTION

Recently, technological developments transform many different fields, including education. One of the most significant innovations has been the development and utilization of Artificial Intelligence (AI) tools in academic environment (Arowosegbe et al., 2024). Artificial Intelligence (AI) is a complex domain that integrates several disciplines to emulate human-like intelligence in machines particularly computer systems(Khaleel et al., 2024). Its uses cover several areas therefore enhancing decision-making processes and efficiency. Grammar checkers, text suggestion systems, plagiarism detectors, and other AI-powered writing tools have become indispensable in academic writing as they give students chances to improve their writing abilities, increase production, and get better academic results(Burkhard, 2022). These instruments support

difficult activities including editing, organizing, and even content idea generation in addition to their mechanical support of writing. Despite their widespread use, there remains limited research on how these tools are adopted and perceived across different student demographics, particularly with regard to gender (male and female).

The increased adoption of AI tools in academic writing raises several important questions: Are male and female students adopting these tools at the same rate? Do they use them with the same frequency, and how do they perceive the effectiveness of this AI tools in improving their writing? Understanding these dynamics is important for educators, administrators, and developers who aim to promote equitable access to educational technologies.

While previous studies have explored gender differences in technology adoption, they often focus on general or non-academic technologies. For instance, research shows that men are often early adopters of new technologies, while women may initially exhibit lower confidence but use them equally effectively over time (Stöhr et al., 2024; Li & Kirkup, 2007).Gender differences in technology adoption and usage are evident across various contexts, which are influenced by factors like perceived usefulness, self-efficacy, and social norms(Abbasi et al., 2020; Jackson et al., 2001). Several studies suggest that men and women often approach technology differently, with variations in confidence, familiarity, and frequency of use (Burkhard, 2022; Goswami et al., 2015; Li & Kirkup, 2007). For instance, Stöhr et al. (2024) study showed that male students tend to be early adopters of new technologies, while female students may initially exhibit lower levels of confidence in using digital tools but eventually use them as effectively as their male counterparts.

Also, In Kazakhstan, Yilmaz et al. (2023) set out to investigate university student opinions of ChatGPT, an example of AI. The researchers guided their study with the Technology Acceptance Model (TAM). Using a questionnaire, 239 students had their data gathered. The findings revealed that their gender, grade level, or major had little impact on their opinions of using ChatGPT. These findings raise the question of whether similar gender patterns exist in the adoption and usage of AI writing tools with regards to undergraduate students at the University for Development Studies in Ghana.

Another critical aspect with AI usage in academic writing is its perceived effectiveness. Even if AI writing tools are meant to raise the quality of produced works, students' perceptions of their utility can influence the extent to which they use them (Winkler & Soellner, 2018). The study by Arowosegbe et al. (2024) indicated that students perceived effectiveness of AI was very positive as they believed AI writing tools had several benefits in their academic endeavours. It remains unclear whether these perceptions differ between genders. Understanding these dynamics can reveal whether AI tools meet the needs of all students or if disparities exist that need to be addressed. Perceived effectiveness could vary across gender lines due to differences in academic preferences, writing styles, or experiences with technology. Investigating these perceptions will help educators better understand whether AI tools meet the needs of all students or if there are gaps that need to be addressed.

Moreover, how AI tools impact academic performance is another area that warrants exploration. AI tools can potentially level the academic playing field by providing all students regardless of their writing proficiency with additional support(Burkhard, 2022). However, whether this impact is gender-neutral remains unclear. Some studies suggest that academic interventions and technologies may benefit male and female students differently, depending on how they interact and integrate them into their learning processes(Yusuf et al., 2024).

The Technology Acceptance Model (TAM)

To better understand students' adoption and usage patterns of AI writing tools, this study is framed within the context of the **Technology Acceptance Model (TAM)**, produced through Davis (1989). TAM provides a mechanism that explains the acceptance and usage of technology (Davis & Granić, 2024). According to the model, two primary factors influence an individual's decision to adopt a new technology:

1. **Perceived Usefulness (PU):** The extent to which one feels employing a given technology would improve their performance(Davis & Granić, 2024). Regarding artificial intelligence (AI) writing tools, their perceived usefulness is connected to how much students think these tools enhance their academic writing quality or enable them to get better marks.
2. **Perceived Ease of Use (PEOU):** The extent to which an individual thinks using technology will be devoid of effort(Davis & Granić, 2024). For AI writing tools, this refers to how easy students find it to use the tools without extensive training or technical challenges.

When students perceive AI tools as both useful and user-friendly, they are more likely to adopt and integrate them into their academic processes. TAM has been widely used to study technology adoption in various contexts and is particularly relevant for examining gender differences in AI tool usage. For example, differences in confidence, familiarity, or previous experience with technology may influence how male and female students perceive and use AI tools (Davis & Granić, 2024).

In the context of AI writing tools, TAM helps explain how students' perceptions shape their behavior toward adopting these technologies. For example, if a student perceives that using AI tools like Grammarly or QuillBot will reduce errors and enhance their writing quality, they are more likely to adopt these tools. Likewise, if they find these tools intuitive and user-friendly, they will be more inclined to use them regularly. These perceptions are further influenced by external elements, such as previous technological experience and peer influence, as noted by Selwyn (2020).

By looking at gender variations in the adoption, usage patterns, and perceived efficacy of AI writing tools among University for Development Studies (UDS) students, this study hopes to close certain gaps. Specifically, the study seeks to examine how frequently male and female students use AI writing tools, how effective they perceive these tools to be, and whether the tools have any differential impact on their academic performance. The results will provide some answers as to whether AI tools are being used equitably across genders and how these tools can be optimized to support diverse student populations.

Objectives of the Study

The study had two (2) main objectives. These are:

1. To examine gender variations in the adoption and usage patterns of AI writing tools among University for Development Studies (UDS) students.
2. To assess how well male and female students believe AI writing tools may improve their academic wriring.

Research Questions

The following research questions were developed to direct the investigation based on the objectives of the study:

1. Are there significant gender variations in the adoption and usage patterns of AI writing tools among University for Development Studies (UDS) students?
2. How do male and female students perceive the effectiveness of AI writing tools to improve academic writing.

METHODS

The research design, participants, sampling technique, data collection techniques, and data analysis processes used in the study are described in this section. The aim is to ensure a systematic approach to examining the adoption and perception of AI writing tools among undergraduate students at the University for Development Studies (UDS).

Research Design

The study uses a quantitative design, employing a cross-sectional survey methodology. This approach is suitable as it enables the gathering of data from a big sample at one moment in time, thereby allowing for comparisons regarding usage patterns and perceptions of AI writing tools among undergraduate students (Baum, 2021). The quantitative approach enables the analysis of relationships and differences among variables, providing statistical evidence to answer the research questions(Kumar, 2019).

Participants

The study had a target population consisting of undergraduate students enrolled at the University for Development Studies. The study focused solely on undergraduate students across various disciplines to ensure a representative sample. A total of 320 undergraduate students were included in the study, which allowed for sufficient statistical power to detect significant differences and relationships between the variables of interest(Chanuan et al., 2021).

Sampling Technique

A multi stage sampling technique was adopted for the selection of sample for the study. The first stage was a simple random sampling technique employed to select three faculties from the university. This method ensures that different faculties were represented in the study. Once the faculties were selected, a sample of participants were then chosen using convenience sampling technique. This sampling method was used to gather data from the participants. To ensure that sufficient data was obtained to offer meaningful insights into the research questions, convenience sampling was implemented in order to increase the response rate.(Tabachnick et al., 2013). This multi stage approach allows for the inclusion of students across various academic levels and disciplines, ensuring a diverse and balanced representation from the selected faculties. The random selection of faculties helped minimize bias and improves the generalizability of the study findings(Schweigert, 2006).

Questionnaire Development and Validation

The questionnaire used in this study was developed based on a thorough review of the literature on AI writing tools, technology adoption, and gender differences in technology use. The questionnaire was designed to capture key variables such as the frequency of AI writing tool use, perceived effectiveness, and demographic information, including gender. The development process involved the following steps:

1. **Item Generation:** Items for the questionnaire were generated based on existing scales related to technology adoption, such as those used in previous studies on AI tools and educational technology (Davis, 1989; Winkler & Soellner, 2018). These items were adapted to specifically address AI writing tools in the context of higher education.
2. **Expert Review:** The initial draft of the questionnaire was reviewed by experts in the field of educational technology and gender studies to ensure the content validity. This review aimed to ensure that the questionnaire items adequately represented the key concepts of AI tool usage and perceptions while being suitable for the local context of UDS.
3. **Pilot Testing:** A pilot test was conducted with a small sample of 30 undergraduate students from UDS who were not part of the final study sample. The pilot test was used to assess the clarity, relevance, and ease of understanding of the questions. Based on feedback from the pilot test, minor revisions were made to improve the wording and structure of some items.
4. **Reliability Testing:** The internal consistency of the questionnaire was measured using Cronbach's alpha coefficient, a widely used measure of reliability. For the sections on perceived effectiveness and frequency of AI tool use, Cronbach's alpha values (0.75) were found to be above the acceptable threshold of 0.70 (Mishra & Bhaskar, 2010), indicating that the instrument had good reliability.

Data Collection

A structured questionnaire was developed to capture the participants' demographic details, usage patterns of AI writing tools, perceived effectiveness of these tools, and their academic performance. The questionnaire was divided into the following parts:

1. Demographic Information: This part collected data on participants' gender.
2. Frequency of Use of AI Writing Tools: The researcher asked participants to indicate how frequently they use AI writing tools (e.g., never, rarely, occasionally, frequently, very frequently).
3. Perceived Effectiveness of AI Writing Tools: The effectiveness of AI writing tools in enhancing the quality of academic writing was sought from participants. A Likert scale of 1 (not effective at all) to 5 (very effective) was used to measure their perceptions.

Data Analysis

Data collected using the structured questionnaires was analyzed using the Statistical Package for the Social Sciences (SPSS) software. The following analytical procedures was employed:

1. Descriptive Statistics: This summarized the demographic information of the participants, as well as their responses regarding the frequency of use and perceived effectiveness of AI writing tools. Which included frequencies, and percentages.
2. Chi-Square Tests: Chi-square tests helped examined gender variations in the adoption and usage patterns of AI writing tools. This analysis was useful as it helped determine if there were significant associations between gender and frequency of use.
3. Independent Samples T-Test: This compared the perceived effectiveness of AI writing tools between male and female undergraduate students. This analysis was aimed to identify any significant differences in perceptions based on gender.

Ethical Considerations

Prior to the data collection, the University for Development Studies' research ethics committee granted ethical sanction. All participants were informed of the study's objective, the voluntary nature of their participation, and their right to withdraw at any time without penalty. Their confidentiality was guaranteed and maintained throughout the research process.

Limitations

While this study aims to provide valuable insights, certain limitations must be acknowledged. The self-reported nature of the data may introduce biases, as participants may overestimate or underestimate their usage of AI writing tools or academic performance. Future research could explore longitudinal designs to understand the impacts of AI writing tools on student performance in the long-term.

RESULTS AND DISCUSSION

The demographic information of the participants, along with their responses regarding adoption of AI tools, the frequency of use and perceived effectiveness of AI writing tools were computed using descriptive statistics. These statistics included frequencies and percentages to provide a clear picture of the data distribution used in the study.

Demographic Data

Gender was the only key demographic data that was taken from the participants of this study. This was key because the sought mainly to investigate ‘gender differences’ in the adoption, usage patterns, and perceived effectiveness of AI writing tools at the University for Development Studies among undergraduate students.

Table 1. Distribution of participants by Gender

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	152	47.5	47.5	47.5
	Female	168	52.5	52.5	100.0
	Total	320	100.0	100.0	

Table 1 presents the gender distribution of the 320 participants in the study. Of the total participants, 152 (47.5%) were male, while 168 (52.5%) were female. This indicates that the sample has a slightly higher proportion of female participants compared to males. The cumulative percentage shows that by the time we account for both genders, 100% of the participants are represented.

Table 2. Adoption of AI Tools

Adopted AI Tools (Yes=1, No=0)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	74	23.1	23.1	23.1
	Yes	246	76.9	76.9	100.0
	Total	320	100.0	100.0	

The adoption of AI writing tools among participants in Table 2, shows that 76.9% of the students (246 out of 320) have adopted AI tools, while 23.1% (74 students) have not. This suggests a high level of AI tool adoption among the participants, with more than three-quarters utilizing these tools. This adoption rate is consistent with findings from previous studies on the increasing integration of technology in education (Arowosegbe et al., 2024). According to the Technology Acceptance Model (TAM), perceived usefulness and ease of use are key factors influencing technology adoption (Davis, 1989). The high adoption rate observed here suggests that students find AI tools to be both useful and easy to integrate into their academic work.

Table 3. Frequency of Use

Frequency of Use					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Daily	101	31.6	31.6	31.6
	Weekly	97	30.3	30.3	61.9
	Monthly	92	28.7	28.7	90.6
	Occasionally	30	9.4	9.4	100.0
	Total	320	100.0	100.0	

The frequency of use of AI writing tools among participants showed a diverse pattern. From Table 3, a total of 31.6% of the students reported using AI tools daily, while 30.3% used them on a weekly basis. Additionally, 28.7% indicated they used these tools monthly, and a smaller portion, 9.4%, used them only occasionally. This data highlights that a significant majority (over 60%) of the students use AI writing tools frequently, either daily or weekly, while a smaller proportion uses them less regularly. This results thus reflects the high level of reliance on AI tools to support academic writing tasks. The consistent and frequent use suggests that AI tools are not just supplementary, but integral to students' academic routines. These findings underscore the increasing importance of AI tools in modern educational practices.

Table 4. Perceived Effectiveness

Perceived Effectiveness					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	18	5.6	5.6	5.6
	Effective	208	65.0	65.0	70.6
	Very Effective	94	29.4	29.4	100.0
	Total	320	100.0	100.0	

From Table 4, the perceived effectiveness of AI writing tools among participants shows that 65.0% (208 out of 320) rated the tools as "Effective," while 29.4% (94 participants) considered them "Very Effective." A smaller portion, 5.6% (18 participants), remained neutral in their assessment of the effectiveness of AI tools. This shows that a large proportion of students recognize the value of these tools in improving their academic writing. These results suggest that AI writing tools are perceived as significant aids in enhancing writing quality, which aligns with the findings of Davis and Granić (2024**)** who argue that perceived usefulness is crucial for technology adoption.

Across all descriptive statistics, it is very clear that AI writing tools have been widely adopted and are frequently used by students, with a significant majority viewing them as effective or very effective. The gender distribution is balanced enough to support comparisons, and the high adoption rate of AI tools suggests that they have become an integral part of students' academic practices.

Gender differences in the adoption and usage patterns of AI writing tools:

In order to examine the association between gender and the frequency of use of AI writing tools among undergraduate students, a Chi-Square test was conducted. This statistical analysis is particularly useful for examining categorical variables and determining whether there is a significant association between them(Tabachnick et al., 2013). In this study, we aimed to assess whether gender influences how frequently students utilize AI writing tools for academic writing tasks. The findings will provide insights into the adoption patterns of AI tools among different gender groups and contribute to the understanding of technology acceptance in educational settings. Below are the results from the Chi-Square test.

Table 5. Chi-square test results

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.469[a]	3	.325
Likelihood Ratio	3.525	3	.318
N of Valid Cases	320		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 14.25.

The Chi-Square test in Table 5 was conducted to explore the relationship between gender and the frequency of use of AI writing tools among undergraduate students. The results (Table 5) indicated no statistically significant relationship between gender and the frequency of use of AI writing tools (χ^2 = 0.325, p = 0.318), suggesting that both male and female students are equally likely to use AI writing tools. Since the p-value exceeds the alpha value of 0.05, it indicates that there is no statistically significant relationship between gender and the frequency of use of AI writing tools. Thus, the findings suggest that among undergraduate students at the University for Development Studies, both male and female students adopt and utilize these tools at comparable rates. These findings are consistent with the TAM framework, which

posits that perceived ease of use and usefulness should, in theory, lead to similar adoption and usage patterns regardless of gender. In other words, both male and female students find AI tools equally valuable for their academic work, leading to similar usage frequencies.

Perceived effectiveness of AI writing tools between male and female undergraduate students

To explore potential gender differences in the perceived effectiveness of AI writing tools among undergraduate students, an independent samples t-test was utilized. This method is effective for comparing the means of male and female students (independent groups), to determine if there exist a statistically significant difference in their perceptions regarding the effectiveness of these tools. Understanding how gender influences students' evaluations of AI writing tools can provide a deeper insight into the broader implications of technology adoption in educational settings and inform strategies for more targeted support and training.

Table 6: Independent samples t-test results

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Perceived Effectiveness	Equal variances assumed	.016	.898	.598	318	.551	.036	.061
	Equal variances not assumed			.599	316.584	.550	.036	.061

Table 6 provides insights into the perceived effectiveness of AI writing tools among male and female undergraduate students. Starting with Levene's test for equality of variances, the results show an F-value of 0.016 with a significance level (Sig.) of 0.898. This high p-value indicates that the assumption of equal variances is true, which allowed us to proceed with the "Equal variances assumed" row for the interpretation of the table.

The t-test results produced a t-value of 0.598. The two-tailed significance value (p-value) is 0.551, which significantly exceeds the alpha level of 0.05. This outcome suggests that there are no statistically significant differences in the perceived effectiveness of AI writing tools between male and female students.

Moreover, the mean difference between the two groups is reported as 0.036, with a standard error difference of 0.061. This suggests that, on average, one gender perceives the effectiveness of AI writing tools slightly higher than the other. However, the difference is not substantial enough to reach statistical significance. This reinforces our conclusion that there is no significant difference in perceptions between the genders.

Summarily, the results indicate that male and female undergraduate students have similar perceptions regarding the effectiveness of AI writing tools in their academic endeavors, as the analysis yielded a p-value of 0.551. This finding highlights a level of uniformity in the attitudes towards AI tools among different genders within the student population. The result aligns with the findings of Gasaymeh et al. (2024), who emphasize that perceived usefulness plays a key role in how technology is perceived, regardless of gender.

DISCUSSION

This research attempted to find out the gender differences with respect to the adoption, usage, and perceived effectiveness of the AI writing tools among the University for Development Studies students. According to the results, the vast majority (76.9%) of students have adopted AI writing tools, and we found the adoption, frequency of use, and perceptions of effectiveness of AI writing tools to be comparable between male and female students with no statistically significant difference. These findings run counter to

expectations, based on previous research, that male students would be more likely to report significant effects from the use of AI tools to bolster academic performance as opposed to female students.

These findings corroborate previous research that has shown a declining trend in gender gaps in technology provisioning over the past few decades, as both genders have become increasingly accustomed to using technology as digital literacy progresses (Burkhard, 2022; Gasaymeh et al., 2024; Stöhr et al., 2024). However, research has shown earlier that male students might tend to use and embrace new technologies particularly fast, but that female students finally show comparable skills (Li & Kirkup, 2007). Perhaps such a phenomenon could shed light on the largely null effects in our results, indicating that males and females are similarly integrating AI tools into their educational habits.

The high adoption rate of AI writing tools is consistent with previous studies that highlights the increasing use of technology in educational settings(Arowosegbe et al., 2024). The varied frequency of use, with 31.6% of students utilizing AI tools daily, indicates a strong shift towards leveraging these technologies to support academic writing. This is significant, as it underscores the increasingly changing landscape of student engagement with digital tools, where both genders have equally adopted AI into their learning processes.

Additionally, the absence of significant gender disparities in the perceived effectiveness of AI writing tools is consistent with the results of prior research, which underscore the importance of perceived utility and user-friendliness as critical factors in the adoption of technology (Davis & Granić, 2024; Gasaymeh et al., 2024; Sevnarayan & Potter, 2024; Yilmaz et al., 2023). Both male and female students equally perceived AI writing tools as beneficial for improving writing quality and academic performance, reflecting a shared understanding of the tools' value regardless of gender.

However, while both genders reported similar usage patterns, the underlying factors influencing their perceptions of effectiveness may differ. Previous literature has emphasized that perceptions of technology can be influenced by factors such as prior experience, perceived usefulness, and ease of use (Nysveen & Pedersen, 2005; Winkler & Soellner, 2018). The consistency in perceived effectiveness across genders in this study suggests that AI tools may be viewed as beneficial by both male and female students, potentially indicating a shared admission of the value these tools provide in enhancing academic performance.

The findings also contribute to the ongoing research on the effect of educational technologies in bridging gender gaps in academic performance. AI writing tools can potentially offer tailored support to students, regardless of their writing proficiency, thereby leveling the playing field (Arowosegbe et al., 2024; Keser, 2024; Stöhr et al., 2024). However, this study's findings prompt further research into whether AI tools are being utilized effectively by all students or if there are hidden factors influencing their academic performance that need to be addressed.

Implications for Curriculum Development, AI Tool Design, and University Learning Policies

These findings have important implications for curriculum development, AI tool design, and learning policies at the university.

1. Curriculum Development:
   Since AI tools are now integral to academic writing, the curriculum should include AI literacy as a core component. Students should not only be trained to use AI tools effectively but also gain an understanding of their ethical implications. Regular training sessions and workshops should be offered to ensure students can navigate these tools confidently, regardless of their prior technology experience. Additionally, incorporating AI-based assignments would encourage students to harness the full potential of these tools.
2. AI Tool Design:
   The findings suggest that AI writing tools are largely neutral in their impact across genders. Thus, developers should focus on designing user-friendly interfaces and personalized features that can cater to

diverse student needs. Features such as customizable feedback based on writing proficiency and discipline-specific requirements can improve usability and ensure that all students benefit equally from AI tools. The tools should also be designed to be mobile-friendly, ensuring students can access them across various devices.

3. Learning Policies and Strategies:
   To ensure equitable access to AI tools, the university could provide institutional licenses for these tools, allowing all students to benefit, regardless of their financial background. This can be complemented by providing students without consistent internet access with offline versions or on-campus access. Furthermore, the university should consider integrating AI tools into academic writing support services, such as writing centers, which could use AI tools to help students improve their writing quality.
   Also, AI tools become more integrated into the academic process, it is crucial to establish clear policies around their ethical use, particularly concerning issues like academic integrity. The university should promote the responsible use of AI tools by educating students on the limitations of AI and encouraging them to use the tools as assistive devices rather than substitutes for their own intellectual effort.

Lastly, there should be mechanisms in place to monitor and evaluate the effectiveness of AI tools in improving academic outcomes. The university could track students' usage patterns and academic performance to identify any gaps or over-reliance on AI tools, ensuring that the tools are used effectively to enhance rather than hinder academic development.

CONCLUSION

In conclusion, the study clearly shows the improvement in adoption and utilization of AI writing tools among students at the University for Development Studies, with no significant gender differences in adoption, usage patterns, or perceived effectiveness. The findings from the study suggest that AI writing tools are perceived as valuable resources for enhancing academic writing across genders, indicating a shift towards a more gender inclusive technological environment in education.

Given the high adoption rates and positive perceptions of AI tools, educators and policymakers should consider integrating these technologies into curricula more comprehensively. By doing so, they can better support all students in enhancing their writing skills and academic performance. The research provides insights into the broader implications of AI adoption in educational settings. While the study focused on gender differences, the absence of significant differences in adoption and effectiveness between male and female students signals that these technologies may be seen as universally beneficial across gender lines. This suggests that gender disparities in technology adoption, particularly in the context of AI writing tools, may be diminishing as both genders become increasingly comfortable with digital tools.

Future studies could expand on these findings by exploring additional variables such as students' academic performance in relation to their usage of AI tools and conducting longitudinal studies to assess the long-term effects of AI integration in academic writing.

Overall, this research contributes to literature on educational technology, emphasizing the importance of understanding gender dynamics in technology adoption. As AI writing tools become increasingly integral to the academic landscape, ensuring equitable access and usage across genders will be essential for fostering an inclusive educational environment.

RECOMMENDATION

Based on the findings of the study, the following recommendations are proposed for educators, policymakers, and stakeholders in higher education especially the University for Development Studies:

1. Educational institutions should establish and implement robust training programs for all students to enhance their understanding and proficiency in using AI writing tools. These programs can include

workshops, seminars, and online resources tailored to address the unique functionalities of these tools, fostering confidence and competence among users.

2. Higher Institutions specifically the UDS should actively promote awareness of AI writing tools and ensure their accessibility to all students. This can involve incorporating information about these tools into orientation sessions, creating informative materials, and utilizing digital platforms to highlight the importance and availability of AI tools for academic writing.
3. Again, higher institutions should Implement initiatives that encourage collaborative learning, pairing students of diverse genders and backgrounds. Such partnerships can facilitate peer support, knowledge sharing, and collective problem-solving regarding the effective use of AI writing tools, ultimately enhancing the overall learning experience of the students.

Educational stakeholders including the University for Development Studies should regularly monitor the integration of AI writing tools in academic settings through feedback mechanisms such as surveys and focus groups. Additionally, encouraging further research into the long-term effects of these tools on academic performance and writing skills across various demographics will inform continuous improvement and adaptation of educational strategies.

REFERENCES

Abbasi, S., Ayoob, T., & Malik, A. (2020). Perceptions of students regarding E-learning during Covid-19 at a private medical college. *Pakistan Journal of Medical Sciences*, *36*(COVID19-S4). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7306963/

Arowosegbe, A., Alqahtani, J. S., & Oyelade, T. (2024). *Students' Perception of Generative AI Use for Academic Purpose in UK Higher Education*. https://doi.org/10.20944/preprints202405.1158.v1

Baum, S. (2021). *Research Questions and Research Design*. 11–27. https://doi.org/10.1007/978-981-16-1677-8_2

Burkhard, M. (2022). Student perceptions of AI-powered writing tools: towards individualized teaching strategies. *19th International Conference on Cognition and Exploratory Learning in Digital Age (CELDA 2022)*. https://www.grammarly.com/plagiarism-checker

Chanuan, U., Kajohnsak, C., & Nittaya, S. (2021). Sample Size Estimation using Yamane and Cochran and Krejcie and Morgan and Green Formulas and Cohen Statistical Power Analysis by G*Power and Comparisions. *Apheit International Journal*. https://so04.tci-thaijo.org/index.php/ATI/article/view/254253

Davis, F. D., & Granić, A. (2024). *The Technology Acceptance Model*. https://doi.org/10.1007/978-3-030-45274-2

Gasaymeh, A.-M. M., Beirat, M. A., & Abu Qbeita, A. A. (2024). University Students' Insights of Generative Artificial Intelligence (AI) Writing Tools. *Education Sciences*, *14*(10), 1062. https://doi.org/10.3390/educsci14101062

Goswami, A., Dutta, S., Goswami, A., & Dutta, S. (2015). Gender Differences in Technology Usage—A Literature Review. *Open Journal of Business and Management*, *4*(1), 51–59. https://doi.org/10.4236/OJBM.2016.41006

Jackson, L. A., Ervin, K. S., Gardner, P. D., & Schmitt, N. (2001). Gender and the internet: Women communicating and men searching. *Sex Roles*, *44*(5–6), 363–379. https://doi.org/10.1023/A:1010937901821

Keser, A. E. (2024). *The promise and peril of AI technology for writing instruction: an exploratory study on stakeholder attitudes toward using AI tools in a university first-year writing program*. The University of Alabama.

Khaleel, M., Jebrel, A., & Shwehdy, D. M. (2024). Artificial Intelligence in Computer Science. *International Journal of Electrical Engineering and Sustainability (IJEES)*, *2*(2), 1–21. https://doi.org/10.5281/zenodo.10937515

Kumar, R. (2019). Research Methodology: Steps by steps guide for begineers. *Sage Publications Limited*. https://books.google.com.my/books?hl=en&lr=&id=J2J7DwAAQBAJ&oi=fnd&pg=PP1&dq=research+methodology&ots=cvlpHFPIki&sig=dd019t5g5CKG55KWE9v7RHMp62s&redir_esc=y#v=onepage&q=research methodology&f=false

Li, N., & Kirkup, G. (2007). Gender and cultural differences in Internet use: A study of China and the UK. *Computers and Education*, *48*(2), 301–317. https://doi.org/10.1016/J.COMPEDU.2005.01.007

Mishra, B., & Bhaskar, A. U. (2010). The learning enabling structure: Validating a measuring instrument. *Indian Journal of Industrial Relations*, 157-164.

Nysveen, H., & Pedersen, P. E. (2005). Explaining intention to use mobile chat services: moderating effects of gender. *Journal of Consumer Marketing*, *22*(5), 247–256. https://doi.org/10.1108/07363760510611671

Schweigert, W. A. (2006). *Research methods in psychology: a handbook*. 316.

Selwyn, N. (2020). The Dilemmas of Critically Researching Technology and Education. *Telling Tales on Technology*, 159–170. https://doi.org/10.4324/9781138368736-11

Sevnarayan, K., & Potter, M. A. (2024). Generative Artificial Intelligence in distance education: Transformations, challenges, and impact on academic integrity and student voice. *Journal of Applied Learning and Teaching*, *7*(1), 104–114. https://doi.org/10.37074/jalt.2024.7.1.41

Stöhr, C., Ou, A. W., & Malmström, H. (2024). Perceptions and usage of AI chatbots among students in higher education across genders, academic levels and fields of study. *Computers and Education: Artificial Intelligence*, *7*. https://doi.org/10.1016/j.caeai.2024.100259

Tabachnick, B., Fidell, L., & Ullman, J. (2013). *Using multivariate statistics*. https://www.pearsonhighered.com/assets/preface/0/1/3/4/0134790545.pdf

Winkler, R., & Soellner, M. (2018). Unleashing the Potential of Chatbots in Education: A State-Of-The-Art Analysis. *Academy of Management Proceedings*, *2018*(1), 15903. https://doi.org/10.5465/AMBPP.2018.15903ABSTRACT

Yilmaz, H., Maxutov, S., Baitekov, A., & Balta, N. (2023). Student Attitudes towards Chat GPT: A Technology Acceptance Model Survey. *International Educational Review*, *1*(1), 57–83. https://doi.org/10.58693/ier.114

Yusuf, A., Pervin, N., & Román-González, M. (2024). Generative AI and the future of higher education: a threat to academic integrity or reformation? Evidence from multicultural perspectives. *International Journal of Educational Technology in Higher Education*, *21*(1). https://doi.org/10.1186/s41239-024-00453-6