



Artificial Intelligence, Academic Writing and Access to Information among Graduate Students at the University for Development Studies

Abdul-Rahim Mohammed Hardi 

University for Development Studies Library, Tamale, Ghana

Issah Dawuda 

University for Development Studies Library, Tamale, Ghana

Inusah Baasha 

University for Development Studies Library, Tamale, Ghana

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Abstract

This study examines the connection between Artificial Intelligence (AI), academic writing and access to information among graduate students at the University for Development Studies (UDS). In an era characterized by the pervasive influence of AI technologies on various facets of academia, including research and scholarly communication, understanding their implications for graduate students' academic writing practices and access to information are of paramount importance. This study seeks to elucidate how AI is shaping the landscape of academic writing and information access, aiming to provide insights that can inform academic institutions, educators and policymakers in fostering an environment conducive to productive and equitable scholarly endeavors. A sample size of hundred and thirteen (113) students was randomly selected from both Masters and PhDs from various programs to ensure even distribution. The study's objectives are: (1) to assess the awareness and utilization of AI among students; (2) to analyze the impact of AI on information access; (3) to identify challenges faced by students in accessing AI; and (4) to evaluate the influence of AI on academic writing. In order to accomplish these objectives, questionnaire is employed as the data collection instrument. This specialized tool gathers insights and perceptions of graduate students regarding AI awareness, experiences with AI in information access, encountered challenges and the effects of AI on their academic writing endeavors. The study found that students at UDS indicate a high level of awareness of AI, students mostly use Digital Writing Assistants (DWAs) like Grammarly, Quilbot, Word Tune, ChatGPT, and other AI-powered tools to enhance their writing skills, enhancing information search and retrieval capacity, making learning and information search fun/gamification, restrictions or limited access due to subscription fees and lack of technical skills in using some AI-powered tools among others. The study's findings aim to enhance our understanding of how AI can empower graduate students and contribute to their academic success while addressing the challenges they face. The findings of this study have the potential to inform pedagogical approaches, support services and policy recommendations that enhance the academic experience of graduate students and promote scholarly excellence in the digital age.

Keywords: Artificial Intelligence (AI), Academic Writing, Information Access, AI Awareness, Scholarly, Digital Age.

Introduction

A rapidly developing field of technology called artificial intelligence (AI), has the power to transform how we interact with one another completely. Pedro, Subosa, Rivas and Valverde (2019) opine that, AI in education has started generating novel instructional and learning strategies currently being used by academics and students in academic exercises. The advent of AI tools which offer mass usage for information access in academic writing changes the possibilities for users of information in academic writing. AI has the capability to produce and select information and knowledge from different professional arenas. In this regard, the niche of universities is drifting from human ingenuity and competencies which AI will not be able to offer for sustainable development (Kabashkin, Misnevs & Puptsau, 2023). According to Attaran et al. (2018), the term AI was first used around the 1950s in the USA at Dartmouth College in a workshop hosted by John McCarthy. The birth and name of AI was introduced by McCarthy at the 1956 Dartmouth Summer Research Project on Artificial Intelligence initiated in a 1955 proposal, authored by John McCarthy. John McCarthy defined AI in his 1955 proposal for the Dartmouth Workshop as follows:

“Every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves (Attaran et al., 2018).”

According to an Online Dictionary for Library and Information Science (ODLIS), AI is a mechanical and electronic devices and applications designed to closely mimic the human ability to learn, reason, and make decisions (ODLIS, 2017). AI can be applied in voice recognition technology, expert systems, natural language, foreign language processing, and robotics, search, pattern recognition, representation, inference among others (ODLIS, 2017). Attaran et al. (2018), define artificial intelligence broadly as; “computers which do cognitive functions, normally associated with human brains, notably learning and problem-solving.” They indicated that the word/term “AI” does not denote a specific tool or instrument. It is a blanket term for various concepts, including: algorithms, neural networks, data mining and natural language processing. Bu”ching et al. (2019), state that the basis for AI is premised on rational agents. An agent is

defined as, “anything that can be seen as experiencing its environment via sensors and acting upon that environment via actuators.” Attaran et al. (2018) categorize AI software applications in education according to:

- personal tutors,
- intelligent support for group learning, and
- intelligent virtual reality.

Intelligent tutoring systems (ITS) could take the place of real one-on-one training. They may customize each student’s course of study and content selection using learner models, algorithms, and neural networks; offer cognitive scaffolding and support, and encourage conversational learning. ITS holds great promise, especially in massive open online courses (MOOCs) with thousands of students where one-on-one mentoring by humans could be challenging. Numerous studies have demonstrated that learning is fundamentally a social activity, with teamwork and communication being essential to knowledge gain (Bu”ching et al., 2019).

One aspect of modern life of which the majority of students are aware but admit they know very little is the development of AI (Simhadri & Swamy, 2023). They add that in recent years, the public, government and the academic community have all shown a great deal of interest in the potentials of artificial intelligence (AI) completely transforming the future. Higher education (HE), like all other spheres of life, will be impacted, maybe to a significant degree. However, Cope, Kalantzis and Sears (2021) state that it is worth noting that the phrase “artificial intelligence” is not fully accepted or welcomed wholeheartedly by all. Some regard artificial intelligence as an enhanced intelligence that recognizes the supremacy of human brains and regard computers and AI-powered tools as software which is an added advantage to human brains. Higher Education will have to acclimatize to this discovery within the knowledge economy to educate students to be able to work with this new technology. AI is changing the process of learning from teachers, researchers and learners and how universities work as institutions (Cox, 2021). The availability of AI among students poses some level of consequences of the increasing emergence of more AI technological tools for educational purposes. These tools allow students to interact more with ICT for information access for educational purposes. Some of these innovations include cloud computing, digital computing, mobile learning, open content, learning analytics, three-dimension (3D) printing,

wearable technology, massively open online learning (MOOCs), online learning, remote labs, Edmodo, learning management systems (LMS), Google Apps for Education (GAfE) and machine learning or Artificial Intelligence learning, among others (Alimi, Buraimoh, Aladesusi, & Babalola, 2021). The use and application of AI is gaining much prominence in various fields. It is gradually becoming part of our normal routine daily activities in areas such as automatic parking systems, smart sensors for taking amazing pictures and personal assistance. We are overwhelmed by the use of AI technology. (Meyer & Norman, 2020).

Artificial intelligence (AI) technologies have numerous exciting prospects to change academic writing and information access, among other aspects of academia, as they continue to advance. However, nothing is known about how these technologies impact graduate students of the University for Development Studies (UDS). The integration of AI technologies in academic writing processes and information retrieval methods among graduate students may provide certain obstacles and ramifications, notwithstanding the possible advantages. The purpose of this study is to investigate and examine how graduate students at UDS are utilizing AI in academic writing practices and information accessibility. This study aims at providing insights that can inform strategies for expanding the integration of AI technologies and enhancing information access by identifying potential hurdles, difficulties and possibilities by addressing the objectives below:

Objectives of the Study

1. Assess the awareness and use of AI among students.
2. Analyze the role of AI in information access among students.
3. To identify challenges encountered by students in accessing AI.
4. Evaluate the impact of AI on academic writing among students.

Literature Review

The introduction of AI as an academic discipline is quite new and can be traced to the 1950s when experts and scholars started discovering the likelihood of machines processing intellectual capabilities similar to those of human beings (Shukla Shubhendu & Vijay, 2013). Popenici and Kerr (2017) disclosed that access to an innovation like AI depends on the knowledge and competence to navigate with such an innovation.

Pedro et al., (2019) opine that higher education and research institutions are seriously building their expertise in AI to boost their capacities and become experts and scholars in the field. According to Simhadri & Swamy (2023), in the past years, AI has emerged strongly based on three main developments such, as faster computer processors, the availability of vast amounts of data and advancements in computational approaches. The role of technology like AI in higher institutions of learning is to improve the level of human thinking to supplement the learning process and not reduce it to a set of procedures for content delivery, control and assessment (Popenici & Kerr, 2017). The applicability of AI is very broad; ranging from varied fields such as medical diagnosis, stock trading, robot control, law, remote sensing, scientific discovery and toys. Integration of AI in higher education can greatly enhance human learning by addressing numerous intellectual challenges, such as conducting research and resolving various issues in higher education (Shukla Shubhendu & Vijay, 2013).

For example, in some countries like Nigeria, Alimi et al., (2021) found that majority of university students are unaware of and do not have access to the use of AI for learning. This was attributed to the reason that AI is a new emerging area within the Nigerian learning environment. Most university students in Nigeria lack the skillset and competence to use AI for learning. Other countries are aware of the potential of AI in education. For instance, France has come out with a framework for AI that intends to develop research and human resources. France also intends to build more academic institutions such as universities and research institutions to enhance AI studies. The framework borders on the development of three thematic areas namely:

- the creation of research laboratories to study how AI transforms the workplace;
- increased incentives for AI researchers to attract both domestic and international talent; and
- the development of AI programs at the bachelor's, master's, and doctoral levels, as well as in technical and vocational education and training (TVET) (Villani, 2018).

Also, in 2020, South Korea launched a master plan dubbed, the 'Fourth Industrial Revolution' as an educational reform that aimed at producing every academic year, 5,000 graduates trained in AI (Sharma, 2018). Besides, a 10-year research grant support is given to topnotch graduate-schools-turned research-center to lead the development of intelligent IT, including

AI'. In addition, the government has devoted funds for domestic scholarships for AI students (Sharma, 2018). According to Lucero (2019) the Government of the People's Republic of China, Next Generation Artificial Intelligence Plan was launched in 2017 in China which is envisioned to make China the world AI innovation center by 2030. This objective is intended to be achieved by the government by rolling out major courses in AI at universities, increasing graduate students' intake for masters and doctorate programs in AI, and integrating AI content in the study of other subject areas such as mathematics, biology, psychology, sociology, and law, among others. Again, in 2018 at Peking University an International AI Training Program for Chinese Universities was launched in line with this project mentioned earlier (China Daily, 2018).

The role of AI in information access is very significant resulting in a more effective and modified learning experience among students. Palmquist (2003) states that students have depended on AI digital writing tools to help them in their academic writing since its discovery in the 1980s. Nobles and Paganucci (2015) state that the discovery of AI and other software that is embedded into word processor technology as grammar analytical tools assists students in improving their writing skills. AI has a long history of evolution and students believe that these tools can support them in improving their writing output. Higher education institutions need to assess which AI tools are accessible to students to provide strategies for their effective use (Nobles & Paganucci, 2015). Besides the inherent spelling, grammar and style checkers integrated into word processing software, new tools have surfaced to surpass the fundamental identification of errors in composition. Some of these new tools offer further guidance to students on enhancing their writing. Digital Writing Assistants (DWAs) like Grammarly, Word Tune and Perusall utilize Artificial Intelligence (AI) to enhance student writing, as noted by Fitria (2021). Students perceive these tools, highlighted in studies by Cavaleri and Dianati (2016) and O'Neill and Russell (2019), as valuable for improving their work. Pedro, et al (2019) state that AI technology has a vision to transform education that can bring about a better learning outcome for both students and tutors as well. For example, an AI tool like 'learning analytics', is a good resource that can make informed decisions to get better learning results. Learning analytics applies different fields of knowledge including sociology, psychology, ethics, pedagogy and many more, to gather more data that can be developed into smart

educational tools for performing educational and administrative errands.

The use of AI to learn in higher educational institutions like universities, presents certain challenges as it is capable of restructuring the learning process and outcomes for the students. Ethical issues are one of the most challenging subject matters in the use of AI by students. AI raises ethical concerns related to student privacy, data security and algorithmic biases. Safeguarding student data and ensuring responsible data use are critical. Additionally, addressing biases in AI algorithms to promote fairness and equity is essential (Holmes, et al, 2021). Education plays a vital role in building the future of nations and individuals to take up roles and responsibilities that lead to sustainable development. However, education now is engrained with the adoption of increasingly powerful AI technologies to facilitate learning outcomes for both students and facilitators. This implies rethinking the content and methodology adopted to teach at all levels of education. This will alter the curriculum and require new skills to decode and conform to the AI norms (Pedro, et al., 2019). AI offers a gamification advantage. AI has injected some level of fun when education appears to be a dull and monotonous application of old methodologies in learning. AI introduces an aspect of game techniques to engage learners' interest in solving problems (Dergunova, et al., 2022). Gamification arouses learners' interest in understanding new and difficult concepts in the teaching and learning processes. It has been discovered that the use of AI tools in education enhances high-level learning and creative thinking among learners. In addition, AI makes learning fun and innovative (Bryant, et al. 2020; Zhao, & Liu, 2018). On the other hand, a challenge of AI is about trust and the uncertainty accompanying its use. For example, there is concern about AI potentially replacing humans in various professions, which could reduce the demand for human intelligence and labor (Spector & Ma, 2019). Academic integrity is compromised through the application of digital writing tools to sway textual plagiarism. Plagiarism leads to inaccurate referencing, intellectual property theft and misrepresentation of authorship (Roe, et al., 2023). However, HE institutions have used plagiarism detection software for decades to protect authors' intellectual properties. The widespread anti-plagiarism software found and used is Turnitin. Turnitin is not a robust and effective software for detecting plagiarism. Tools such as machine translators (MTs) for example, Google Translate, digital writing

assistants (DWAs) like Grammarly and automated paraphrasing tools (APTs) like ChatGPT, can all avoid Turnitin systems (Mphahlele & McKenna, 2019). Roe, et al., (2023) have advised that educators need to know about the AI tools-- AI text-producing tools, ChatGPT and chatbot that their students use. This is because all these tools can legitimately be utilized within HE to benefit students and faculty. These AI tools have demonstrated their value in assisting students in writing through legitimate means. However, if they are wrongly used, it can lead to a significant risk to academic integrity and digital writing within HE. Dehouche (2021), has disclosed that in the media and academia, much attention is being drawn to GPT-3 and ChatGPT as regards their impact on academic integrity. AI allows for easy copying and duplication of tasks. However, copying here does not denote the kind of copying during examinations by students but a replication of an activity or task performed by AI; for instance, rephrasing a research topic or a sending a message by AI (Shukla Shubhendu & Vijay, 2013). Many concerns are raised regarding academic integrity with the use of AI in copying. Perkins (2023) states that the implication of AI in copying is great to the extent that it is greatly affecting the academic integrity of higher education (HE) to the extent that a trained faculty is unable to distinguish between a text that is produced by students from AI, especially from large language models (LLMs) such as ChatGPT and that of human effort.

The Study Area

The study was carried out at the University for Development Studies (UDS) in the Northern Region of Ghana. UDS was established by the Provisional Defense Council (PNDC) Law 279 of 1992. The University was mandated to serve the educational needs of the pro-poor Northern Regions of Ghana. The UDS operates a multicampus university system with four campuses comprising the Nyankpala, the Tamale, the Citi, and the Tamale Teaching Hospital Campuses (UDS, 2017).

Methodology

A survey method was employed for the study through the use of questionnaire as data collecting tool. Google form questionnaires were posted on WhatsApp platforms of students' group of each program from October to December 2023. The questionnaire comprises both open and closed-ended questions. Creswell and Creswell (2017) indicate that open-ended questions reveal unanticipated rich and

in-depth information in the data collection process. The questionnaire was structured to comprise the research objectives which was structured into five parts. The first part takes care of the demographic characteristics of the respondents and the second part sought to solicit information on the awareness and use of AI among students. Part three delved into obtaining information about the role of AI in information access among students. Part four dealt with challenges encountered by students in accessing AI and Part five asked questions on the impact of AI on academic writing among students. The study targeted graduate students at various levels in different programs across the various campuses at UDS.

The population for the study was one thousand, one hundred, and thirty-four (1134) graduate students; comprising masters and Ph.D. programs from all the levels (500 to 700) (UDS Human Resource Planning Department). Nwana (1981) noted that a population in many hundreds required a sample size of 20%; a few thousands required a sample size of 10%, and several thousands required a sample size of 5% or less. Based on this endorsement from Nwana (1981), a sample size of 10% was randomly used to select one hundred and thirteen (113) students from both Masters and PhDs across all levels in various programs to ensure even distribution. The study adopted the Statistical Package for the Social Sciences (SPSS) for the analysis of the data collected. In order to help in the presentation and discussions of the findings, tables, percentages and frequencies were extracted from the data.

Results and Discussion

From the one hundred and thirteen (113) respondents that were given the questionnaires to answer, one hundred and ten (110) returned their questionnaire completed. This resulted in a response rate of 97%.

Socio-Demographic Profile

The respondents were made up of both genders. The results indicated that 77 (70%) were males while 33 (30%) were females. This means that the majority of the respondents were males. With regards to age, the majority representing the age group of 25-30 was 73 (66%); while those aged 35 and above were 17 (15%); 30-35 were 11 (10%) and the least age group was those between 20 and 25 were 9 (8%).

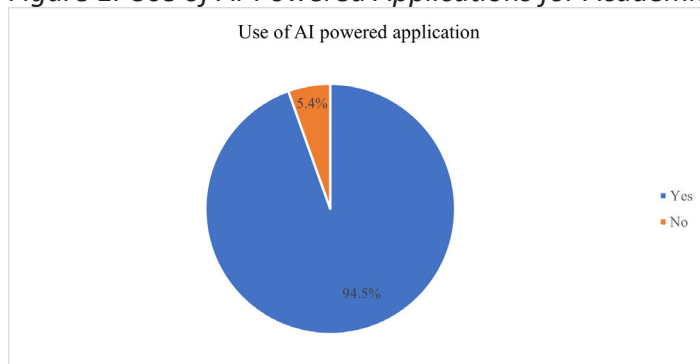
Table 1. Demographic Characteristics of Respondents

S/N	Variables		Frequency	Percentage	Sample Size
1	Gender	Male	793	69.9%	79.3
		Female	341	30.0%	34.1
		Total	1134	99.9%	113.4
2	Age range	20 to 25 years	12	10.6%	1.2
		26 to 30 years	47	41.5%	4.7
		35 to 40 years	41	36.2%	4.1
		45 years and Above	13	11.5%	1.3
		Total	113	99.8%	11.3%
3	Program/Level of study	PHD	Year 1: 52	39.6%	5.2
			Year 2: 51	39.2%	5.1
			Year 3: 60	46.5%	6
			Year 4: 0	0.0%	-
		Total	163		16.3
		MPHIL	Year 1: 647	57.0%	64.7
			Year 2: 290	25.5%	29
		Total	937		93.7
		MA/MBA/MPA/MSC	Year 1: 17	1.5%	1.7
			Year 2: 17	1.5%	1.7
		Total	34		3.4

Source: Field survey, 2023

Awareness and Use of Artificial Intelligence

The study is to find out from respondents whether they are aware of the existence of the concept of AI. The results show that 101 (91.8%) of respondents are aware of AI. The results indicate a high level of awareness of AI. These findings concur with Dergunova, et al. (2022) who found that the level of awareness about AI among students at the university was high, especially regarding the scope of research.

Figure 1. Use of AI-Powered Applications for Academic Purposes

Source: Field survey, 2023

Figure 1 above indicates information about student usage of AI-powered applications for academic purposes. The majority of respondents 104 (94.5%) answered that they have used AI applications for academic exercises and 6 (5.4%) of the respondents answered they did not use AI for their academic purposes.

Table 2. AI-Powered Tools Used for Academic Exercise

AI tool/application	Frequency	Percentage
Grammarly	110	100%
Turnitin	99	90%
Endnote	102	92.7%
ChatGPT	105	95.4%
Quillbot	107	97.2%
Writefull	7	6.3%
Mendeley	97	88.1%
Wordtune	3	2.7%

Source: Field survey, 2023

To further ascertain the level of awareness about AI-powered tools, respondents were asked to list some of the AI-powered tools or applications they have ever used for academic exercise. Their responses are presented in Table 2. It was revealed from their responses that all the respondents 110 (100%) have used Grammarly, 107 (97.2%) have used Quillbot, 105 (95.4%) made use of ChatGPT, Endnote 102 (92.7%), Turnitin 99 (90%), Mendeley 97 (88.1%), Writefull 7 (6.3%) and Wordtune 3 (2.7%). The findings clearly indicate that students use AI-powered applications in their academic pursuits. These findings concur with Fitria's (2021) findings which found that students use Digital Writing Assistants (DWAs) like Grammarly, Word Tune, Perusall and other AI-powered tools to enhance their writing skills. It can be argued that because Grammarly and Quillbot help students in writing by checking for spelling and grammatical errors, students use them more to enhance their writing skills. They offer suggestions for synonyms, punctuation, style and clarity of expression.

Role of AI in Information Access

The study's second objective is to find out the role of AI in information access among students. "Yes" or "no" options were given to respondents to indicate AI's role in their access to information. All the respondents

110 (100%) answered that AI has played a significant role in their academic writing.

The study further intends to find out the role of AI in Information access among students. Respondents were asked to select from a set of options, the role of AI in information access. Table 3 shows the responses.

Table 3. Role of AI-Powered Tools in Academic Writing

Role of AI in Information Access among Students	Frequency	Percentage
Plagiarism checking	97	88
Spelling and grammar checking	110	100
Information retrieval and search optimization	54	49
Editing and proofreading	79	71.8
Translation of languages	43	39
Data analysis and research	110	100
Reference and citation management	109	99

Source: Field survey, 2023

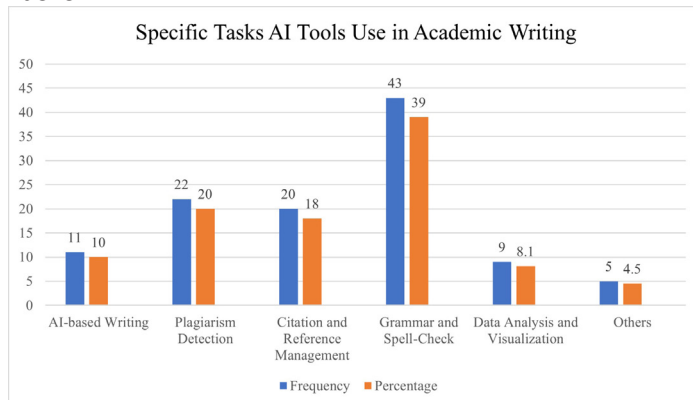
The study found that AI-powered tools play important role in improving academic writing of students through varied means to help students in their academic exercises. These roles include: spelling and grammar checking; and data analysis and research 110 (100%), 109 (99%) reference and citation management, 97 (88%) plagiarism checking, 79 (71.8%) editing and proofreading, 54 (49%) information retrieval and search optimization, 43 (39%) translation of languages. These findings revealed various significant roles AI-powered tools play in students' academic writing which affirm Nobles and Paganucci (2015) studies. They reported that AI evolution has changed students' belief that these tools can support them in improving their writing output in many ways. (Fitria, 2021; Nobles & Paganucci, 2015), also confirm that besides the inherent spelling, grammar, and style checkers integrated into word processing software, new tools have surfaced to surpass the fundamental identification of errors in composition. For instance, Digital Writing Assistants (DWAs) like Grammarly, Word Tune, Perusall and ChatGPT among others utilize AI-powered tools to offer further guidance to enhance student writing.

Impact of AI on Academic Writing

The study again intends to find out the impact of student usage of AI tools in academic writing tasks. The responses indicate that all the respondents 110 (100%) stated that the use of AI tools has affected the quality of their academic writing. Respondents were then asked to indicate how frequently they use AI tools or applications in their academic writing exercises. This was done through a Likert question with the responses: very frequently, somewhat frequently and rarely. Majority of the respondents 77 (70%) indicated that they use AI tools very frequently, while 32 (29%) indicated that they use AI tools somewhat frequently and 1 (0.9%) said AI tools are rarely used for academic writing tasks.

Again, respondents were asked to select from options, specific tasks they normally use AI tools for in their academic writing. The results are presented in Figure 2. The majority of the respondents 43 (39%) use AI purposely for grammar and spell-check; while 22 (20%) for plagiarism detection and 20 (18%) for citation and reference management. Another 11 (10%) for AI-bases writing, 9 (8.1) specifically for data analysis and visualization and 5 (4.5%) representing other specific purposes for AI used in academic writing by graduate students.

Figure 2. Specific AI Tools Used in Academic Writing Tasks



Source: Field survey, 2023

Another objective of the study is to identify the various ways through which AI-powered tools have impacted students' academic writing endeavors. Respondents were given the chance to brainstorm and describe the impact of AI usage on their academic writing exercises through an open-ended question. The study found several positive impacts through the use of AI tools by students in their academic writing activities. These are presented in Table 4

Table 4. Impact of Using AI-Powered Tools

Impact	Frequencies	Percentage
Improves grammar and spelling skills	110	100%
Improves efficiency and research output	87	79
Enhances information search and retrieval capacity	101	91.8
Makes learning and information search fun/gamification	65	59
Provides access to a variety of information sources	82	74.5
Prevents plagiarism by encouraging ethical academic writing practices	93	84.5
Provides citation and referencing support	110	100
It does not encourage critical thinking and creativity by copying and overreliance on AI	109	99
Misunderstanding or misinterpretation of AI-generated feedback	77	70

Source: Field survey, 2023

The results showed that all the respondents 110 (100%) indicated that the use of AI-powered tools in their academic exercises improves their grammar and spelling skills as well as provides citation and referencing support and 109 (99%) said that overreliance on AI-powered tools in academic writing does not encourage critical thinking and creativity by copying. This finding is in tandem with (Shukla et al., 2013; Perkins, 2023) who opine that AI-powered tools allow for easy copying and duplication of tasks raising concerns about academic integrity especially from large language models (LLMs) such as ChatGPT. But the finding contradicts (Bryant, et al. 2020; Zhao & Liu, 2018 and Popenici & Kerr, 2017) who discovered that the use of AI tools in education enhances high-level learning and improves the level of human creative thinking among learners. About 101 (91.8%) respondents revealed that it enhances their information search and retrieval capacity; 93 (84.5%) answered that it prevents plagiarism by encouraging

ethical academic writing, 87 (79%) revealed that it improves their efficiency and research output, 82 (74.5%) indicates that it provides access to a variety of information sources, 77 (70%) indicate that the use of AI-powered tools in academic writing can lead to misunderstanding or misinterpretation of AI-generated feedback by students, and 65 (59%) state that using AI-powered tools in academic writing makes learning and information search fun (gamification). These findings concur with Dergunova, et al., (2022) who found out that AI offers a gamification advantage by injecting some level of fun when education appears to be dull and monotonous application of old methodologies in learning. AI introduces an aspect of game techniques to engage learners' interest in understanding new and difficult concepts in the teaching and learning processes.

Challenges in Accessing AI-Powered Tools for Academic Purposes

Students may face various challenges in the use of and access to AI tools or applications for academic exercises. Therefore, respondents were asked to indicate the challenges they face in accessing AI-powered tools for academic exercises. The results revealed that, out of the 110 sampled, the majority, representing 62 (56.3%) pointed to restrictions or limited access due to subscription fees as a major challenge in accessing AI-powered tools for academic exercises. The findings of this current study resonate with Nobles and Paganucci (2015) studies which suggest that access to AI application tools is always restricted or limited, as a result, higher education institutions need to evaluate the availability of AI tools that students use more and develop strategies for their subscription for effective use by their students.

Fifteen (13.6%) indicated poor access to the internet, 13 (11.8%) stated institutional policies and licensing issues may limit the use of certain AI-powered tools; 9 (8.1%) mentioned ethical issues. This finding collaborates with Holmes et al (2021) findings which state that AI raises ethical concerns related to student privacy, data security and algorithmic biases; whereas 11 (10%) suggested the lack of technical skills in using some AI-powered tools. This finding confirms (Popenici & Kerr, 2017; Subosa, et al., 2019) findings that access to innovations like AI depends on the knowledge and competence to navigate through such innovation and that higher education and research institutions are seriously building their expertise in AI to boost their capacities in AI and to become experts

and scholars in the field.

Conclusion

In conclusion, the study investigated artificial intelligence, academic writing, and access to information among graduate students in the University for Development Studies. Students at all levels of graduate studies were selected to participate in this study. Based on the results from the study, the findings revealed that graduate students at UDS indicate a high level of awareness of AI, especially regarding research and academic purposes. It was found that students mostly use Digital Writing Assistants (DWAs) like Grammarly, Quillbot, Word Tune, ChatGPT and other AI-powered tools to enhance their writing skills. AI plays a significant role in improving the writing skills of graduate students. The use of AI tools by students in academic writing has several positive impacts, including enhancing the capacity for information search and retrieval, making learning and information search more engaging through gamification, and preventing plagiarism by promoting ethical academic writing practices, among other benefits.

Among the challenges encountered in accessing AI-powered tools or resources for academic purposes were limited access due to subscription fees, poor access to the internet, ethical issues and lack of technical skills in using some AI-powered tools.

Recommendations

Considering the findings from the study, these recommendations are proposed:

- Based on the increased usage of AI by students, academic institutions, especially graduate schools, should find ways to introduce AI studies as a course among graduate courses.
- Regular workshops and seminars should be organized to educate students on the proper and ethical use of AI-powered tools in their academic endeavors.
- Academic institutions should endeavor to secure licenses for AI-powered tools usage for academic writing purposes to promote ethical AI application usage.
- The provision of effective internet connectivity can provide unlimited access to AI-powered tools to enhance students' research and writing skills.

If these recommendations are properly implemented it can go a long way to promote an environment necessary to enhance and promote effective use and access of AI-powered tools for effective academic writing outcomes among graduate

students.

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Corresponding Author

Abdul-Rahim Mohammed Hardi
arhardi@uds.edu.gh

