Journal of Digital Educational Technology
2025, 5(2), ep2515
e-ISSN: 2752-5503
https://www.jdet.net/

Research Article

OPEN ACCESS

Familiarity and usage of AI assistive technology in education: Spotlight on postgraduate students

Joseph Baidoo [1]* , Kingsford Bondzie [1]

[1] Department of Basic Education, School of Education and Lifelong Learning, University of Education, Winneba, Winneba, GHANA
***Corresponding Author:** algyasare5@yahoo.com

Citation: Baidoo, J., & Bondzie, K. (2025). Familiarity and usage of AI assistive technology in education: Spotlight on postgraduate students. *Journal of Digital Educational Technology, 5*(2), ep2515. https://doi.org/10.30935/jdet/17411

ARTICLE INFO

Received: 26 Dec. 2024

Accepted: 30 Sep. 2025

ABSTRACT

Artificial intelligence (AI) has permeated various fields of human endeavor, including the field of education. Teachers and students in tertiary institutions worldwide are relying heavily on powerful AI assistive tools such as virtual teaching assistants and various forms of ChatGPT for enhanced learning experiences. Against this backdrop, this study examined the level of familiarity and usage of AI assistive technologies in education among postgraduate students at the University of Education, Winneba (UEW). To achieve this, structured questionnaires were administered to 104 postgraduate students at various levels of their studies using the descriptive cross-sectional survey design. Responses from these questionnaires were analyzed using frequency counts, percentages, mean and standard deviation. The findings of the study suggest that postgraduates exhibited familiarity with only 7 of 19 AI assistive technologies such as *ChatGPT*, *Grammarly*, *Google Translate*, *QuillBot*, *Microsoft Bing Chat*, *Photomath*, and *Google Bard*. Again, only *Grammarly* and *ChatGPT* were frequently utilized on a weekly basis through mobile phones for various tasks, including assignments completion and online search for information. Among the key challenges faced in utilizing these tools were a lack of knowledge of their uses, high speed Internet demand of these AI tools as well as the poor Internet (Wi-Fi) connectivity in UEW. Based on the findings, it is recommended for the departments and the UEW Graduate Students Association of Ghana to tailor their weekly and monthly seminars to meet the needs of its postgraduate students in the face of the rising prominence of AI in education.

Keywords: AI assistive technology, usage patterns, familiarity, challenges, UEW postgraduate students

INTRODUCTION

Artificial intelligence (AI) has rapidly emerged as one of the most transformative technologies of the 21st century, reshaping industries and redefining human interaction with digital systems. AI refers to computer systems designed to perform tasks that traditionally require human intelligence, such as reasoning, learning, language processing, and decision-making (Dwivedi, 2025). In education, AI applications are increasingly recognized for their role in enhancing academic work, improving teaching and learning, and boosting overall productivity (UNESCO, 2023). Generative AI tools such as ChatGPT, Microsoft Copilot, and Google Gemini have gained global attention for their ability to generate human-like responses, summarize complex texts, provide personalized assistance, and even create computer code (Bail, 2024). These tools have significantly influenced how students and researchers engage with information by promoting efficiency in writing, problem-solving, and knowledge acquisition (UNESCO, 2023). Studies have shown that AI fosters personalized learning experiences, enabling students to access tailored feedback and adapt learning processes to individual needs (Mizumoto & Eguchi, 2023). Similarly, researchers argue that AI reduces faculty workload by automating routine academic tasks and enhancing the quality of feedback given to students (Chan & Hu, 2023). AI is also considered a valuable academic assistant for students, supporting literature reviews, proofreading, coding, and idea generation (Nyaaba et al., 2024).

In Ghana, the integration of AI into higher education is still at an early stage. Some universities such as the University of Ghana and Kwame Nkrumah University of Science and Technology (KNUST) have begun experimenting with AI-powered systems to enhance student services and teaching (Essel et al., 2022). For example, KNUST has introduced "KNUSTbot," an AI assistant designed to respond to student queries (Fosu et al., 2023). Similarly, the University of Ghana has included AI applications in business and computer science curricula to prepare students for emerging professional demands (University of Ghana Business School [UGBS], 2024). However, in teacher-training universities like the University of Education, Winneba (UEW), AI adoption is limited, even

though postgraduate students are expected to master advanced research and pedagogical skills for their future careers (AIGHANA, 2024). This raises concerns about how prepared they are to engage with AI for research, teaching, and professional growth.

Despite its growing adoption, AI usage in education presents significant challenges. Scholars have warned that reliance on AI tools can lead to plagiarism and intellectual dishonesty, as students may use AI-generated content without proper attribution (Chan, 2023). Others caution that the misuse of AI may erode critical thinking skills and creativity, as students risk depending too heavily on AI rather than developing their own analytical capabilities (Abbas et al., 2025). Evidence also shows that AI models such as ChatGPT sometimes generate factually incorrect information or inaccurate citations, which may mislead students and compromise academic integrity (Baidoo-Anu & Owusu Ansah, 2023; Gordijn & Have, 2023). Furthermore, generative AI may create convincing yet misleading compositions, raising concerns about the authenticity and credibility of postgraduate theses (Thurzo et al., 2023). At the same time, broader structural challenges such as limited Internet connectivity, poor digital literacy, and a lack of institutional guidelines on AI usage constrain effective and ethical adoption in many African universities (Carstens et al., 2021; Gyamerah, 2020).

At the UEW, the researchers observed that while some students, including undergraduates, are aware of and heavily use AI in their education, others have no knowledge of this current trend. Informal discussions with students have revealed that some use AI tools to complete personal tasks related to their program of study, while others offer their services to complete tasks for undergraduate or fellow postgraduate students for a fee. Assignments that would have taken weeks of utilizing institutional libraries and online databases can now be completed in milliseconds using AI tools. The researchers of this study argue that the excessive dependence and use of AI tools in education by postgraduate students may make them lazy and less self-reliant, depriving them of the opportunity to develop essential skills and knowledge required at the postgraduate level, such as critical thinking skills (Kasneci et al., 2023; Mhlanga, 2023; Shiri, 2023), problem-solving skills (Kasneci et al., 2023), imagination, and research abilities (Shiri, 2023). These skills are crucial for postgraduates in their future careers. Sok and Heng (2023) express concern over how the use of AI tools like ChatGPT may have negative consequences on students, including a lack of innovation and poor decision-making abilities, which are essential for academic and professional success.

Although international studies have investigated AI adoption and its educational implications, there remains limited research focusing on postgraduate students in Ghana, especially in teacher-training universities. In Ghana, the few studies conducted on AI in education have mainly focused on technology use and its effects (Carstens et al., 2021), as well as knowledge and use of technological devices in teaching and learning. The closest study to the present research was by Essel et al. (2022), who examined the use of a virtual teaching assistant (Chatbot) among undergraduate students at KNUST. While useful, their study was experimental and limited to Chatbot use, which differs from the current study that broadly considers AI assistive tools in education. Moreover, their focus on undergraduates leaves a gap in understanding how postgraduate students, who are future educators, policymakers, and researchers. Their ability to effectively engage with AI could significantly influence the quality of research output, teaching delivery, and academic innovation in the country. Moreover, understanding their level of familiarity with AI tools, their usage patterns, and the challenges they encounter provides vital insight for institutions like UEW to design appropriate training programs, policies, and support systems.

Against this background, the present study explores the familiarity and usage of AI assistive technologies among postgraduate students at the UEW. Guided by three research questions, it seeks to establish:

(1) the level of familiarity with AI assistive tools in education among postgraduate students in UEW,

(2) the usage pattern of AI assistive tools in education among postgraduate students in UEW, and

(3) the challenges postgraduate students in UEW face when using AI assistive tools in education.

The findings are expected to provide evidence to inform policy, guide postgraduate training in digital literacy, and promote the responsible and ethical use of AI in higher education.

LITERATURE REVIEW

Theoretical Framework

This study is anchored on the theory of technology acceptance model (TAM) of Davis (1989) which explains postgraduates students' decisions and motivational factors to use AI assistive technology in education. TAM suggests that the two critical factors influencing any decision to use technological tools are the perceived usefulness (PU) and the perceived ease of use (PEOU). The theory was further extended by Venkatesh et al. (2003) to include a third construct as attitude towards using technology (ATUT). That's to say that when users have new technologies, decisions regarding the mode and time to use them are influenced by factors such as PU, PEOU (Kalusopa & Ngulube, 2012), and ATUT (Venkatesh et al., 2003). PU is the extent to which one anticipates benefits will be derived when one uses a technology and PEOU is the extent to which one anticipates one will be able to use a technology without any obstacle or hindrance (Davis, 1989, p. 320). ATUT is one's general behavior towards the use of a technology (Venkatesh et al., 2003, p. 455). In the context of this study, the acceptance, adoption, and use of AI assistive technologies in the educational activities of postgraduate students are influenced by their perception of the usefulness, ease of use of the AI assistive tools or software as well as their attitude towards technology in general. By using this model, it helped to ascertain the level of familiarity, means of accessing, their uses and the challenges of AI assistive technology in education. These factors have impact on their attitude towards such technological tools.

Empirical Review

Studies on AI use in higher education have shown both opportunities and challenges. For example, Anani et al. (2025) examined postgraduate students' use of AI in academic writing at a university, using the theory of planned behavior. With a sample of 339 students, data were collected through questionnaires and interviews and analyzed with descriptive statistics. Findings revealed mostly positive attitudes toward AI, as students saw it as useful for grammar, plagiarism checks, idea generation, and overall writing improvement, though some feared over-reliance could affect critical thinking. Similarly, Black and Tomlinson (2025) carried out a qualitative study with 39 undergraduates in a US sustainability and technology course, where students documented their AI use in final projects. Thematic analysis showed that AI supported understanding, editing, proofreading, and efficiency, though students emphasized keeping intellectual independence and distinguished between AI assistance and original thinking. In East Java, Indonesia, Amani and Bisriyah (2025) used a qualitative case study with 40 EFL students to explore AI in self-regulated writing. Through questionnaires, interviews, and document analysis, they found AI was valued for grammar, spelling, and vocabulary support, but students still relied on human guidance for deeper explanations and worried about reduced comprehension if overly dependent on AI.

Likewise, Vieriu and Petrea (2025) studied 85 second-year students at POLITEHNICA Bucharest using a structured questionnaire. Frequency counts and thematic analysis showed that AI improved personalization, engagement, and academic performance, yet raised issues of privacy, academic dishonesty, and weaker critical thinking. Extending to dissertation evaluation, Juma et al. (2025) investigated AI adoption in universities in Zambia, Rwanda, and Kenya through surveys, interviews, and AI-assisted reviews. They found AI reduced faculty workload and improved feedback quality, but adoption was slowed by poor digital literacy, infrastructure limits, and ethical concerns, highlighting the need for policies and training. In Ghana, Baidoo-Anu et al. (2024) surveyed 277 university students using the Students' ChatGPT Experiences Scale, validated through factor analysis. Results identified three factors shaping views: academic benefits, concerns, and accessibility. Students recognized ChatGPT's potential but used it mainly for assignments or non-academic purposes, constrained by fears of over-reliance, originality loss, and lack of training. Finally, Akbar (2025) conducted a mixed-methods study of 105 doctoral students, including surveys and interviews. Analysis showed AI was widely used, with men and non-science students more likely to apply it for data analysis and planning. Benefits included support in coding, proofreading, writing, and time management, but challenges involved plagiarism risks, misleading content, intellectual property concerns, reduced creativity, and even environmental costs.

Conceptual Framework

The conceptual framework is built around the use of AI assistive tools in education among postgraduate students at the UEW. The diagram is shown in **Figure 1**.

Figure 1 shows that at the top of the framework is the central theme: AI assistive tools in education. From this, three key components branch out, representing the study objectives. The first component is level of familiarity, which explores how well postgraduate students know and understand AI tools, including their awareness and prior exposure. The second component is usage patterns, which examines how students practically apply AI in their academic work, such as for writing support, idea generation, editing, or research. The third component is challenges, which focuses on the barriers students face, such as technical difficulties, ethical concerns, over-reliance, or lack of training. All three components connect directly to the expected outcome: Insights into AI adoption and educational impact on postgraduate students' academic work. This outcome captures how familiarity, usage patterns, and challenges together shape the way AI is integrated into postgraduate education, providing evidence on both opportunities and risks. The framework illustrates that postgraduate students' familiarity with AI, the ways they use it, and the challenges they encounter are interrelated factors that collectively influence the adoption of AI tools in higher education and their impact on learning.

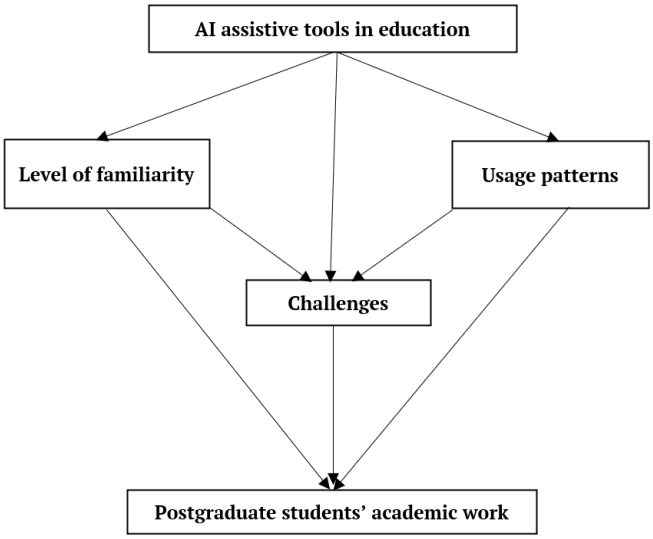

Figure 1. Conceptual framework on AI familiarity and usage by postgraduate students (the authors' construct, 2023)

METHODOLOGY

Research Design

This study adopted a quantitative research approach consistent with the positive paradigm. A descriptive cross-sectional survey design was employed to address the study objectives:

(1) to assess the level of familiarity with AI assistive tools in education among postgraduate students,

(2) to examine the usage patterns of these tools, and

(3) to identify the challenges students face when using them.

The design was considered suitable because it makes it possible to describe the views and experiences of a specific group at a particular point in time (Ihudiebube-Splendor & Chikeme, 2020). According to Allen (2017), this design enables

researchers to collect data from a large number of respondents at once in order to define characteristics of a population without manipulating any variables. In this study, the design was particularly appropriate because it allowed the researcher to capture the current state of AI awareness, use, and challenges among postgraduate students at UEW. Since AI tools are still emerging in education, the design made it possible to obtain a clear snapshot of how these students are engaging with such tools in their academic work.

Sample and Sampling Procedure

The study involved a total of sixty-three postgraduate students at the UEW. Thirty-one students were drawn from one department, and thirty-two from another department in the same university. Because the number of postgraduate students in these two departments was small, census sampling was used. This means the study included every member of the population rather than selecting a portion. Census sampling was chosen because it allows for full coverage of all postgraduate students in those departments, ensuring that findings about familiarity with AI tools, patterns of usage, and challenges faced are truly representative of that population. Baidoo and Tetteh (2024) supports the use of census or complete enumeration when the population is small and the aim is to get accurate, comprehensive data from all the postgraduate students.

Instrumentation

The study employed a structured questionnaire. The instrument consisted of four sections designed to collect data aligned with the research objectives. Section A focused on gathering respondent demographics. Section B included nineteen items to assess the participants' familiarity with AI assistive tools. Section C had nineteen items on the usage, the frequency of usage as well as the media of usage of these AI assistive tools in their education. Lastly, section D comprised eight items exploring the challenges faced by postgraduate students in the use of AI assistive tools in education. The response format for each item on section D was dichotomous, requiring participants to choose between "yes" or "no" options, except for section B and C, which assessed the extent of usage of AI assistive tools. Clear instructions were provided for each section, guiding participants on how to respond to the questionnaire items. Additionally, spaces were provided for respondents to provide their opinions where necessary.

Validity and Reliability

To ensure the quality of the research instrument, both face and content validity were established through expert review. Two lecturers from the department of basic education examined the instrument, checking for typographical errors, ambiguities, and grammatical issues. Their feedback and advice were incorporated to refine the instrument before the actual data collection. The reliability of the instrument was further tested using Cronbach's alpha. The overall coefficient value of 0.76 indicated an acceptable level of reliability, meeting the threshold suggested by Cohen et al. (2018). This confirmed that the instrument was suitable for field data collection. Additionally, the items were carefully constructed to align with the research questions, ensuring consistency between the study objectives and the data to be collected.

Data Collection and Ethical Procedure

The data was collected from sixty-three postgraduate students at the UEW, Ghana during the second term of the 2021/2022 and 2022/2023 academic year cohorts of postgraduate students. The researcher obtained permission from the head of department of the two departments involved before administering the survey instrument. After permission was granted, this was followed up with a personal meeting and administration of the instrument to postgraduate students in their respective seminar rooms. To ensure ethical considerations were met, the researcher sought and obtained permission, ensured confidentiality, and anonymity.

Data Analysis

The data collected were coded and analyzed using the statistical package for social sciences version 27. Before the main analysis, the dataset was carefully examined to check for missing values and outliers to ensure accuracy and reliability of results. For the demographic characteristics of respondents, the data were analyzed using frequencies and percentages. To address research question 1 and research question 2 (familiarity with AI assistive tools and usage patterns), means and standard deviations in addition to frequencies and percentages were used to provide both descriptive and comparative insights. For research question 3 (challenges faced by postgraduate students in using AI assistive tools), the analysis relied on frequencies and percentages only, since the focus was to identify the most commonly reported challenges.

RESULTS

Research question 1. What is the level of familiarity level of familiarity with AI assistive tools in education among postgraduate students in UEW?

To ascertain the level of familiarity of postgraduate students with AI assistive technology in education, nineteen of the most famous AI assistive technology were listed for them to rate their level of familiar with these tools. The items were hinged on a four-point Likert-scale questionnaire of 1 to 4 as "not familiar", "somehow familiar", "moderately familiar" and "very familiar". The responses were interpreted on three key levels of familiarity as 0–1.99 (not familiar), 2.0–3.0 (familiar) and 3.1–4.0 (very familiar). The results are shown in **Table 1**.

The results from **Table 1** based on the mean of the response show that postgraduate students were familiar with only ChatGPT. In relation to the two groups of AI, postgraduate students exhibited familiarity with only Grammarly and Google Translate under the narrow intelligence non-conversational productivity AI tools, while for the general intelligence conversational productivity AI tools, ChatGPT (3.5 or 4) stood out as familiar. However, the mean score for QuillBot (mean [M] = 1.95, standard deviation [SD] = 1.14) leaned greatly towards the familiar category. Synchronizing this finding with the percental responses, ChatGPT (73/70%), Grammarly (65/63%), Google Translate (63/61%) had the highest counts and percentage of students who were familiar than those who were not. QuillBot (50/48%) similarly lean towards the highest. Hence, in general, it was

Table 1. Familiarity of AI assistive tools

Statement	Frequency (N) [percentage (%)]				M [SD]	Remarks
How familiar are you with these AI assistive technology in education?	Not familiar	Somehow familiar	Moderately familiar	Very familiar		
Grammarly	39 [38]	21 [20]	23 [22]	21 [20]	2.25 [1.16]	Familiar
Photomaths	58 [56]	29 [30]	10 [10]	7 [8]	1.67 [0.91]	Not familiar
Endnote	72 [69]	18 [17]	12 [11]	2 [2]	1.46 [0.77]	Not familiar
Mendeley	76 [73]	16 [15]	9 [9]	3 [3]	1.41 [0.77]	Not familiar
QuillBot	50 [48]	18 [17]	20 [19]	16 [15]	1.95 [1.14]	Not familiar
Zotero	79 [76]	18 [17]	3 [3]	4 [4]	1.35 [0.72]	Not familiar
Google Translate	41 [39]	24 [23]	22 [21]	17 [16]	2.14 [1.19]	Familiar
ChatGPT (3.5or 4)	31 [29]	19 [18]	29 [28]	25 [24]	2.46 [1.16]	Familiar
ChatSonic	80 [76]	12 [12]	8 [8]	4 [9]	1.38 [0.79]	Not familiar
Youchat	76 [73]	13 [13]	10 [10]	5 [5]	1.46 [0.85]	Not familiar
Microsoft Bing Chat	61 [59]	21 [20]	17 [16]	5 [5]	1.67 [0.92]	Not familiar
Jasper	79 [76]	13 [13]	9 [9]	3 [3]	1.38 [0.77]	Not familiar
Google Bard	64 [62]	18 [17]	19 [18]	3 [3]	1.62 [0.88]	Not familiar
Claude	87 [84]	13 [13]	4 [4]	0 [0]	1.20 [0.49]	Not familiar
NeevaAI	83[80]	16 [15]	5 [5]	0 [0]	1.25 [0.54]	Not familiar
Perplexity	84 [81]	15 [14]	4 [4]	1 [1]	1.25 [0.57]	Not familiar
Character.AI	84 [81]	12 [12]	7 [7]	1 [1]	1.28 [0.63]	Not familiar
Elicit	91 [88]	12 [12]	1 [1]	0 [0]	1.14 [0.43]	Not familiar
Learnt.AI	90 [87]	4 [4]	6 [6]	4 [4]	1.27 [0.74]	Not familiar

Scale: 0–1.99 (not familiar), 2.0–3.0 (familiar), and 3.1–4.0 (very familiar)
Percentage: Not familiar (Not) & Familiar (Somehow + Moderate + Very familiar)
Familiar AI assistive tools in order: ChatGPT, Grammarly, Google Translate, & QuillBot
Source: Field work (2023)

Table 2. Frequency of usage of AI assistive tools

Statement	Frequency (N) [percentage (%)]				M [SD]	Remarks
How frequently do you use these AI assistive technology in your current studies?	Never	Sometimes	Often	Always		
Grammarly	43 [41]	32 [31]	16 [16]	13 [13]	2.04 [1.09]	Used
Endnote	79 [76]	19 [18]	6 [6]	0 [0]	1.30 [0.57]	Never used
Photomaths	64 [62]	27 [26]	10 [10]	3 [3]	1.54 [0.79]	Never used
Mendeley	81 [78]	13 [13]	8 [8]	2 [2]	1.34 [0.71]	Never used
QuillBot	55 [53]	28 [27]	10 [10]	11 [11]	1.78 [1.00]	Never used
Zotero	80 [77]	15 [15]	7 [7]	2 [2]	1.34 [0.69]	Never used
Google Translate	59 [57]	20 [19]	13 [13]	12 [11]	1.79 [1.06]	Never used
ChatGPT (3.5or 4)	35 [34]	22 [21]	24 [23]	23 [22]	2.34 [1.16]	Used
ChatSonic	74 [71]	20 [19]	4 [4]	6 [6]	1.44 [0.82]	Never used
Youchat	81 [78]	17 [16]	4 [4]	2 [2]	1.30 [0.64]	Never used
Microsoft Bing Chat	74 [71]	19 [18]	7 [7]	4 [4]	1.43 [0.79]	Never used
Jasper	81 [78]	16 [15]	7 [7]	0 [0]	1.29 [0.59]	Never used
Google Bard	76 [73]	14 [13]	11 [11]	3 [3]	1.43 [0.80]	Never used
Claude	89 [86]	9 [9]	6 [6]	0 [0]	1.20 [0.53]	Never used
NeevaAI	89 [86]	10 [10]	3 [3]	2 [2]	1.21 [0.59]	Never used
Perplexity	89 [86]	8 [8]	3 [3]	4 [4]	1.25 [0.69]	Never used
Character.AI	88 [85]	9 [9]	6 [6]	1 [1]	1.23 [0.59]	Never used
Elicit	91 [88]	10 [10]	2 [2]	1 [1]	1.16 [0.48]	Never used
Learnt.AI	90 [87]	4 [4]	6 [6]	4 [4]	1.15 [0.54]	Never used

Scale: Mean: 0–1.99 (Never used), 2.0–3.0 (Used), and 3.1–4.0 (Always)
Percentage: Never used (Never) and Used (Sometimes + Often + Always)
Most frequently used (%-wise) AI assistive tools in order: ChatGPT and Grammarly
Source: Field work (2023)

found that most postgraduate students were familiar with only four of the AI assistive technologies used in education such as ChatGPT, Grammarly, Google Translate, and QuillBot. The implication is that these tools have gained significant recognition and attention among postgraduate students yet this number was very low in comparison with the nineteen AI technology listed. This attests to their low level of familiarity. It further means that these four tools are likely to have a higher potential for adoption and usage in educational setting due to their established level of familiarity among the students.

Research question 2. What is the usage pattern of AI assistive tools in education among postgraduate students in UEW?

This research question sought to examine the frequency of use of AI assistive technology together with the medium used in accessing the AI tools. The results are displayed in **Table 2**.

The responses in **Table 2** indicated that on the average, postgraduate students except for ChatGPT (M = 2.34, SD = 1.16) and Grammarly (M = 2.04, SD = 1.09) never utilized any of the nineteen use AI assistive technology. Percentage-wise,

Table 3. Frequency of usage of AI assistive tools

Statement	Frequency (N) [percentage (%)]				Interpretation
	Monthly	Weekly	Daily	Not at all	
Please, specify the frequency of your usage of the AI tools you have ticked	28 [27]	35 [34]	30 [29]	11 [10]	On weekly basis

Source: Field work (2023)

Table 4. Medium of accessing AI assistive tools

Statement	Frequency (N) [percentage (%)] (out of 100% each)			Interpretation
	Mobile phone	Tablet	Laptop	
What device/s do you use to access the AI assistive technology/software ticked?	77 [74]	6 [6]	61 [59]	Postgraduate students access AI mostly on their mobile phone

Source: Field work (2023)

Table 5. Usage of AI assistive tools

Preamble	Uses of AI	Number (%)	Interpretation
What do you use the AI software's ticked for?	To solve assignments	70 [67]	[✓]
	To write long essays	27 [26]	[ ]
	To write theses/proposals	32 [30.8]	[ ]
	For paraphrasing/summary	41 [39]	[ ]
	For translations	32 [31]	[ ]
	For searching information	71 [68]	[✓]
	For data analysis	19 [18]	[ ]
	To check for plagiarism	24 [23]	[ ]
	For references/citations	35 [33]	[ ]

Key usage: (1) To solve assigned tasks, (2) Surf for information
Ticked (✓) means most frequent uses as observed by half (+) of the respondents
Source: Field work (2023)

Table 6. Challenges in the usage of AI assistive tools

Statement	Frequency (N) [percentage (%)] (out of 100% each)		Interpretation
	Challenges	Number (%)	
What challenges do you face with the use of the AI software?	I lack digital devices (computer/ laptop/ phone).	22 [21]	[ ]
	I do not know how to use the AI software.	64 [62]	[✓]
	I do not have Internet to use AI software.	26 [25]	[ ]
	It requires a fast internet connection.	57 [55]	[✓]
	It causes plagiarism for me.	24 [23]	[ ]
	The school Wi-Fi is slow, hindering access.	53 [51]	[✓]
	It provides incorrect information/references.	28 [27]	[ ]
	It consumes Internet data/bundle.	44 [42]	[ ]

Key challenges: (1) fast Internet, (2) Poor access to UEW Wi-Fi
Ticked (✓) means most frequent challenge as observed by half (+) of the respondents
Source: Field work (2023)

Grammarly was used in the narrow intelligence non-conversational productivity AI tools category while among the general intelligence conversational productivity AI tools ChatGPT was also used. In general, except for Grammarly (61/59%) and ChatGPT (69/66%), that number of postgraduates who uses them to be higher than the those who never used, all remaining seventeen AI were never utilized in any educational activities among the majority of the postgraduate students. This shows that students in higher institutions of learning show little enthusiasm and interest in the use of digital tools and its related platforms. This response is further shown on **Table 2** and **Table 3**.

To further explain their usage pattern and frequency, they were asked to indicate the various digital tools used in accessing the software. The results are shown in **Table 4**.

The results in **Table 4** show that the majority of postgraduate students use mobile phones in accessing AI software for educational purposes. The handy nature of such devices could explain their frequency of use by these students.

From **Table 5**, it was revealed that the majority of postgraduate students use AI assistive technology to write long essays for undergraduate students and their own research thesis/proposal. Other popular usages were for paraphrasing and searching for online information.

Research question 3. What challenges do postgraduate students face when using AI assistive tools in education?

The last research question sought to find out the challenges postgraduate students face in the use of these AI assistive tools in education. the results are displayed in **Table 6**.

The data in **Table 6** revealed that postgraduate students are failing to harness the full potential of AI assistive technologies chiefly because they lack knowledge of its usage. Similarly. the poor Internet connectivity in the university, high Internet data/bundle demand of such tools are also not helping their usage.

DISCUSSION

Level of Familiarity with AI Assistive Tools in Education

The findings of this study revealed that many postgraduate students at the UEW lacked a good level of familiarity with AI assistive tools in education. Out of nineteen AI tools listed, students reported being familiar with only seven: ChatGPT, Grammarly, Google Translate, QuillBot, Microsoft Bing Chat, Photomath, and Google Bard. This limited awareness and use can be understood through the lens of the TAM developed by Davis (1989). According to TAM, two main factors, such as PU and PEOU, determine whether individuals accept and use a new technology. In this study, students' limited familiarity with AI tools may suggest that either they do not fully recognize the usefulness of these tools for their academic work, or they perceive them as difficult to access and integrate into their learning routines. For example, tools such as Grammarly or Google Translate are widely used because students can easily see their direct benefits in improving writing accuracy and language clarity (high PU and high PEOU). However, more advanced AI tools designed for specialized academic tasks may be underutilized because students are either unaware of their potential usefulness or consider them too complex. This highlights the TAM principle that technology adoption depends not only on availability but also on users' perceptions and experiences. These findings align with earlier reports. For instance, the Walton Family Foundation (2023) observed that although many students and educators are beginning to explore AI tools as they become available to the public, their knowledge and application of these tools in educational contexts remain limited. Similarly, Odewumi et al. (2019) found that even simple technologies, such as mobile phones, were less used by master's students compared to PhD students for research and learning, indicating that familiarity and academic level influence technology adoption. This is consistent with TAM's notion that user context shapes PU.

In the Ghanaian context, this study resonates with Gyamerah (2020) and Dampson et al. (2020), who reported that many Ghanaian students, including postgraduates, show low participation and enthusiasm in using digital tools for online learning. The current findings extend this evidence to AI assistive tools, showing that limited familiarity persists even at the postgraduate level. This further underscores that for students to embrace AI, universities must strengthen both awareness and training, which can improve students' perceptions of usefulness and ease of use. Compared with earlier AI-related research in Ghana, the findings fill an important gap. For example, Essel et al. (2022) studied the use of a virtual teaching assistant (Chatbot) at KNUST, focusing on undergraduates. While their study provided insights into the potential of AI in student learning, it was limited to one tool (Chatbot) and one group (undergraduates). The present study, however, broadens the scope to cover multiple AI assistive tools and specifically considers postgraduate students, who are expected to demonstrate higher independence in research and writing. This makes the findings unique and relevant for shaping postgraduate education in Ghana. Recent developments in Ghanaian universities also provide useful context. Reports by Fosu et al. (2023) and AIGHANA (2024) show that AI adoption is slowly gaining ground in institutions like the University of Ghana and KNUST, where AI is being integrated into coursework, seminars, and even exam preparation. For instance, the University of Ghana's department of computer science now offers courses in AI and machine learning, while the UGBS (2024) has introduced AI-focused seminars on generative AI and financial reporting. Similarly, at KNUST, AI has been integrated into multimedia programming courses and used in the College of Health Sciences to generate examination questions (Essel et al., 2022; KNUST CHS, 2024). However, despite these institutional strides, the findings from UEW suggest that postgraduate students' familiarity remains limited. This gap highlights the need for deliberate interventions at UEW and similar institutions, such as structured training on AI tools, integration of AI in postgraduate curricula, and sensitization programs to improve both PU and PEOU. Doing so will align with the TAM framework and enhance acceptance and adoption of AI in postgraduate education.

Usage Patterns of AI Assistive Tools in Education

Postgraduate students at UEW reported frequent use of AI tools such as Grammarly and ChatGPT, mostly on a weekly basis and mainly through mobile phones. These tools were applied for completing assignments, searching for information, and improving academic writing. This usage patterns of AI assistive tools, interpreted through the TAM developed by Davis (1989), emphasizes PU and PEOU as key determinants of technology adoption. In this study, postgraduate students reported regular use of only Grammarly and ChatGPT on a weekly basis, primarily through mobile phones for assignments, grammar correction, and online information searches. This selective adoption reflects TAM's core principles: students gravitated towards tools they considered both practical for their academic needs (PU) and simple to operate (PEOU), while neglecting other AI tools they found less familiar or less accessible. However, the restricted reliance on just two tools indicates limited awareness and training, which constrained broader integration into their academic practices. These findings resonate with Anani et al. (2025), who discovered that postgraduate students generally perceived AI tools as helpful for grammar, plagiarism checks, idea generation, and overall writing improvement, although some worried that over-reliance might weaken critical thinking. Similarly, Black and Tomlinson (2025) showed that undergraduates in the USA used AI for efficiency, editing, and proofreading but still insisted on protecting their intellectual independence, reflecting cautious engagement with AI. Amani and Bisriyah (2025) found comparable results among EFL students in Indonesia, who valued AI for grammar, spelling, and vocabulary support but still sought human guidance for deeper explanations, underscoring an unease with depending too heavily on AI. In the Ghanaian context, Baidoo-Anu et al. (2024) revealed that although students acknowledged ChatGPT's academic benefits, they often restricted its use to assignments or non-academic purposes, citing fears of over-reliance, reduced originality, and inadequate training. Similarly, Akbar (2025) found that doctoral students widely used AI for proofreading, time management, and research support, though concerns over plagiarism risks, misleading

outputs, intellectual property violations, and reduced creativity remained. Beyond these usage patterns, further challenges emerged. Chan (2023) warned that frequent dependence on tools like ChatGPT could erode students' ability to build knowledge independently through reading and research, while Abbas et al. (2024) argued that excessive use of AI might encourage procrastination, memory loss, and weaker learning abilities. Cardona et al. (2023) also highlighted the danger of misinformation in AI-generated outputs, an issue reinforced by Baidoo-Anu and Owusu Ansah (2023) and Gordijn and Have (2023), who reported that ChatGPT often produces factual errors and fabricated citations. These issues carry implications for academic integrity, as noted by Thurzo et al. (2023), who cautioned that AI-generated texts may infringe upon copyright or promote plagiarism. Moreover, concerns about originality and authenticity in postgraduate work are reinforced by the fact that AI can generate convincing but misleading compositions (Baidoo-Anu & Owusu Ansah, 2023). This challenge extends to ethical concerns, as students may misuse AI to complete assignments or projects, gaining unfair academic advantages (Mhlanga, 2023; Qadir, 2022; Taecharungroj, 2023). Complicating this further is the difficulty of distinguishing between AI- and human-generated text (Cotton et al., 2023; Else, 2023), which makes monitoring academic integrity a pressing challenge. Taken together, the findings show that postgraduate students' use of AI assistive tools is shaped by TAM's principles of usefulness and ease of use but is simultaneously constrained by ethical concerns, misinformation risks, and fears of over-dependence. While Grammarly and ChatGPT are integrated into students' academic routines, their broader potential remains underexplored, pointing to the need for structured training and institutional guidelines to ensure responsible and effective use.

Challenges of Using AI Assistive Tools in Education

The study revealed several key challenges that hinder the effective use of AI assistive tools among postgraduate students at UEW. The most pressing obstacles included limited knowledge of how to use these tools, the heavy demand for high-speed Internet, and the unreliable Wi-Fi connectivity on campus. These challenges can be meaningfully understood through the lens of Davis's (1989) TAM. According to TAM, both PU and PEOU shape users' intention to adopt technology. In this case, while students recognize the potential usefulness of AI tools, the difficulties associated with poor infrastructure and inadequate training negatively affect their perception of ease of use, thereby reducing adoption and consistent engagement. Similar patterns are evident in broader contexts. Vieriu and Petrea (2025) found that although AI enhanced personalization, engagement, and performance for Romanian students, critical concerns such as academic dishonesty and reduced critical thinking limited its value. In a multi-country study, Juma et al. (2025) highlighted that poor digital literacy, weak infrastructure, and ethical dilemmas slowed AI adoption in African universities, despite its demonstrated usefulness in reducing faculty workload and improving dissertation feedback. These findings mirror the infrastructural and knowledge barriers faced by UEW students, further validating the TAM framework, which emphasizes the interplay between technical challenges and technology adoption. Likewise, Akbar (2025) noted that doctoral students in diverse fields, while benefiting from AI in coding, proofreading, writing, and time management, faced challenges including plagiarism risks, misleading content, intellectual property concerns, reduced creativity, and even environmental costs. Collectively, these insights suggest that postgraduate students' adoption of AI is hindered not only by infrastructural deficits but also by concerns over ethics and academic integrity, which weaken their perceptions of both ease of use and long-term usefulness. Addressing these barriers through reliable infrastructure, targeted training, and strong ethical guidelines is therefore critical if AI tools are to be fully and responsibly integrated into postgraduate education at UEW.

CONCLUSION AND RECOMMENDATION

The findings highlighted three key issues for the university's departments and UEW Graduate Students Association of Ghana (GRASAG-UEW) to consider when rolling out seminars and workshops for its postgraduate students.

First and foremost, students' familiarity with only a handful of AI assistive technologies implies limited exposure to trending and emerging tools, which may restrict their ability to fully benefit from the wide range of AI resources available for advanced learning, research, and productivity. Hence, to enhance the participation of postgraduate students in workshops and seminars organized at UEW, the authorities in charge should consider focusing these programs more on trending AI applications in education to broaden students' exposure and competence.

Secondly, students' use of only Grammarly and ChatGPT on a weekly basis through mobile phones for assignments and information search implies that, although AI tools are supporting efficiency, their over-reliance on a narrow range of applications may weaken originality, critical thinking, and research independence. Hence, to guide students in balancing AI assistance with independent scholarships, GRASAG-UEW, as a matter of urgency, must seek to educate its members on the functionalities, limitations, and, most importantly, the responsible and ethical use of such technologies.

Lastly, the challenges of limited knowledge, high Internet demand, and poor Wi-Fi connectivity at UEW imply that students' effective and equitable access to AI tools is significantly constrained, limiting their ability to maximize the educational potential of AI. Hence, to promote effective adoption and use of AI in postgraduate education, GRASAG-UEW should consider initiatives aimed at supplementing the quality of Internet service provided to its members. Internet routers could be mounted in the various postgraduate seminar rooms of the various departments.

It is suggested for future researchers to delve into the preference levels of students regarding AI technology usage and the reasons behind these preferences. This will help gain a deeper understanding of the factors influencing students' attitudes and choices when it comes to adopting and using AI assistive tools in education. Furthermore, it is recommended to conduct additional research using a larger sample size to validate and verify the findings of this study. Lastly, a study could be conducted to assess the influence of students'

background characteristics on their use of AI assistive tools in education.

Author contributions: JB: conceptualization, methodology, formal analysis, validation, writing – review & editing; **KB:** conceptualization, methodology, data curation, writing – original draft. Both authors approved the final version of the article.

Funding: No external funding is received for this article.

Acknowledgments: The authors would like to thank all postgraduate students involved in this study. The authors would also like to thank the heads of the departments used in this study.

Ethics declaration: The authors declared that permission was obtained from the Heads of Departments involved in the study, and informed consent was secured from all participants. All ethical considerations were strictly observed. The study adhered to established ethical guidelines for data collection and analysis, ensuring confidentiality and anonymity where necessary. Additionally, the authors maintained transparency in reporting the findings, thereby upholding the integrity of the research process.

Declaration of interest: The authors declare that they have no competing interests.

Availability of data and materials: All data generated or analyzed during this study are available for sharing when appropriate request is directed to corresponding author.

REFERENCES

Abbas, M., Khan, T. I., & Jam, F. A. (2025). Avoid excessive usage: Examining the motivations and outcomes of generative artificial intelligence usage among students. *Journal of Academic Ethics, 23*, 2423–2442. https://doi.org/10.1007/s10805-025-09659-3

AIGHANA. (2024). *AI education and talent development in Ghana*. AIGHANA. https://aighana.net/ai-education-talent-development-ghana

Akbar, M. N. (2025). Use of artificial intelligence tools by doctoral students: A mixed-methods explanatory-sequential investigation. *Journal of Further and Higher Education, 49*(7), 995–1013. https://doi.org/10.1080/0309877X.2025.2515135

Allen, M. (Ed.). (2017). *The SAGE encyclopedia of communication research methods*. SAGE. https://doi.org/10.4135/9781483381411

Amani, N., & Bisriyah, M. (2025). University students' perceptions of AI-assisted writing tools in supporting self-regulated writing practices. *IJELTAL: Indonesian Journal of English Language Teaching and Applied Linguistics, 10*(1), 91–107. https://doi.org/10.21093/ijeltal.v10i1.1942

Anani, G. E., Nyamekye, E., & Bafour-Koduah, D. (2025). Using artificial intelligence for academic writing in higher education: The perspectives of university students in Ghana. *Discover Education*, *4*(1), Article 46. https://doi.org/10.1007/s44217-025-00434-5

Baidoo, J., & Tetteh, R. (2024). Preparedness of postgraduate students to conduct educational research: Insights from a Ghanaian public university. *International Journal of Research and Innovation in Social Science, 8*(5), 1729–1740. https://doi.org/10.47772/IJRISS.2024.805127

Baidoo-Anu, D., & Owusu Ansah, L. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *SSRN*. https://doi.org/10.2139/ssrn.4337484

Baidoo-Anu, D., Asamoah, D., Amoako, I., & Mahama, I. (2024). Exploring student perspectives on generative artificial intelligence in higher education learning. *Discover Education*, *3*(1), Article 98. https://doi.org/10.1007/s44217-024-00173-z

Bail, C. A. (2024). Can generative AI improve social science? *PNAS, 121*(21), Article e2314021121. https://doi.org/10.1073/pnas.2314021121

Black, R. W., & Tomlinson, B. (2025). University students describe how they adopt AI for writing and research in a general education course. *Scientific Reports, 15*(1), Article 8799. https://doi.org/10.1038/s41598-025-92937-2

Cardona, M. A., Rodríguez, R. J., & Ishmael, K. (2023). *Artificial intelligence and the future of teaching and learning: Insights and recommendations*. US Department of Education, Office of Educational Technology. https://www.ed.gov/sites/ed/files/documents/ai-report/ai-report.pdf

Carstens, K. J., Mallon, J. M., Bataineh, M., & Al-Bataineh, A. (2021). Effects of technology on student learning. *Turkish Online Journal of Educational Technology, 20*(1), 105–113.

Chan, C. K. Y. (2023). A comprehensive AI policy education framework for university teaching and learning. *International Journal of Educational Technology in Higher Education, 20*(1), Article 38. https://doi.org/10.1186/s41239-023-00408-3

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education, 20*(1), Article 43. https://doi.org/10.1186/s41239-023-00411-8

Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge. https://doi.org/10.4324/9781315456539

Cotton, D. R., Cotton, P. A., & Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *EdArXiv*. https://doi.org/10.35542/osf.io/mrz8h

Dampson, D. G., Addai-Mununkum, R., Apau, S. K., & Bentil, J. (2020). COVID-19 and online learning: A SWOT analysis of users' perspectives on the learning management system of University of Education, Winneba, Ghana. *International Journal of Learning, Teaching and Educational Research, 19*(9), 382–401. https://doi.org/10.26803/ijlter.19.9.20

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Dwivedi, Y. K. (2025). Generative artificial intelligence (GenAI) in entrepreneurial education and practice: Emerging insights, the GAIN framework, and research agenda. *International Entrepreneurship and Management Journal, 21*, Article 82. https://doi.org/10.1007/s11365-025-01089-2

Else, H. (2023). Abstracts written by ChatGPT fool scientists. *Nature, 613*(7944), Article 423. https://doi.org/10.1038/d41586-023-00056-7

Essel, H. B., Vlachopoulos, D., Tachie-Menson, A., Johnson, E. E., & Baah, P. K. (2022). The impact of a virtual teaching assistant (chatbot) on students' learning in Ghanaian higher education. *International Journal of Educational Technology in Higher Education, 19*, Article 57. https://doi.org/10.1186/s41239-022-00362-6

Fosu, R., Mensah, K., Adjei, P., & Boateng, S. (2023). AI readiness in Ghanaian universities: Challenges and prospects. *Journal of Educational Technology in Africa*, *6*(1).

Gordijn, B., & Have, H. T. (2023). ChatGPT: Evolution or revolution? *Medicine, Health Care, and Philosophy, 26*, 1–2. https://doi.org/10.1007/s11019-023-10136-0

Gyamerah, K. (2020). *Education and COVID-19: Is Ghana ready to return to the classroom?* University of Bristol School of Education. https://schoolofeducation.blogs.bristol.ac.uk/2020/06/01/education-and-covid-19-is-ghana-ready-to-return-to-the-classroom/

Ihudiebube-Splendor, C. N., & Chikeme, P. C. (2020). *A descriptive cross-sectional study: Practical and feasible design in investigating health care-seeking behaviors of undergraduates*. SAGE. https://doi.org/10.4135/9781529742862

Juma, L., Chavula, P., Kayusi, F., Omwenga, M. K., Mishra, R., & Mwewa, T. (2025). AI in dissertation examination: Opportunities for undergraduates and postgraduates in Zambia, Rwanda, and Kenya. *LatIA, 3*, Article 329. https://doi.org/10.62486/latia2025329

Kalusopa, T., & Ngulube, P. (2012). Developing an e-records readiness framework for labour organizations in Botswana. *Information Development*, *28*(3), 199–215. https://doi.org/10.1177/0266666912446209

Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., Stadler, M., & Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*, Article 102274. https://doi.org/10.1016/j.lindif.2023.102274

KNUST CHS. (2024). *KNUST College of Health Sciences embraces artificial intelligence for examination question setting*. KNUST College of Health Sciences. https://chs.knust.edu.gh/news/knust-college-health-sciences-embraces-artificial-intelligence-examination-question-setting

Mhlanga, D. (2023). Open AI in education: The responsible and ethical use of ChatGPT towards lifelong learning. *SSRN*. https://doi.org/10.2139/ssrn.4354422

Mizumoto, A., & Eguchi, M. (2023). Exploring the potential of using an AI language model for automated essay scoring. *Research Methods in Applied Linguistics, 2*(2), Article 100050. https://doi.org/10.1016/j.rmal.2023.100050

Nyaaba, M., Shi, L., Nabang, M., Zhai, X., Kyeremeh, P., Ayoberd, S. A., & Akanzire, B. N. (2024). *Generative AI as a learning buddy and teaching assistant: Pre-service teachers' uses and attitudes*. arXiv. https://arxiv.org/abs/2407.11983

Odewumi, M. O., Onojah, A. O., & Aderogba, A. J. (2019). Postgraduate students' study mode and utilization of mobile technologies for learning in Nigeria. *Indonesian Journal of Learning and Instruction, 2*(2).

Qadir, J. (2022). Engineering education in the era of ChatGPT: Promise and pitfalls of generative AI for education. *TechRxiv*. https://doi.org/10.36227/techrxiv.21789434.v1

Shiri, A. (2023). ChatGPT and academic integrity. *Information Matters, 3*(2). https://doi.org/10.2139/ssrn.4360052

Sok, S., & Heng, K. (2023). ChatGPT for education and research: A review of benefits and risks. *SSRN*. https://doi.org/10.2139/ssrn.4378735

Taecharungroj, V. (2023). "What can ChatGPT do?" Analyzing early reactions to the innovative AI chatbot on Twitter. *Big Data and Cognitive Computing, 7*(1), Article 35. https://doi.org/10.3390/bdcc7010035

Thurzo, A., Strunga, M., Urban, R., Surovková, J., & Afrashtehfar, K. I. (2023). Impact of artificial intelligence on dental education: A review and guide for curriculum update. *Education Sciences, 13*(2), Article 150. https://doi.org/10.3390/educsci13020150

UGBS. (2024). *UGBS department of accounting hosts seminar on generative AI and financial reporting*. University of Ghana Business School. https://ugbs.ug.edu.gh/news/ugbs-department-accounting-hosts-seminar-generative-ai-and-financial-reporting

UNESCO. (2023). *Guidance for generative AI in education and research*. United Nations Educational, Scientific and Cultural Organization. https://unesdoc.unesco.org/ark:/48223/pf0000386693

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478. https://doi.org/10.2307/30036540

Vieriu, A. M., & Petrea, G. (2025). The impact of artificial intelligence (AI) on students' academic development. *Education Sciences, 15*(3), Article 343. https://doi.org/10.3390/educsci15030343

Walton Family Foundation. (2023). *ChatGPT used by teachers more than students, new survey from Walton family foundation finds*. Walton Family Foundation. https://www.waltonfamilyfoundation.org/chatgpt-used-by-teachers-more-than-students-new-survey-from-walton-family-foundation-finds