



Postgraduate students' voices on leveraging Grammarly as an AI-powered tool in academic writing

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Abstract

Artificial intelligence (AI)-powered writing assistant tools such as Grammarly have exponentially changed the landscape of teacher education, raising the question: "How can lecturers and students leverage the potential of these tools?" They have also highlighted the need to investigate their use in an open-distance e-learning context, which prompted an investigation of the views of postgraduate students about Grammarly as a specific tool for academic writing in an online course. This exploratory mixed-methods design study was grounded in a pragmatic perspective. Six participants were selected to participate in semi-structured online interviews via Microsoft Teams. The online interviews were recorded, transcribed, and downloaded. A sample of 34 respondents completed our highly reliable ($\alpha < .89$) self-designed online questionnaire. To analyse the data, NVivo 14, was employed, data were imported, and the themes were generated as guided by the NVivo thematic analysis process. To ensure the trustworthiness of the data sets and identified themes, the participation validation process was used to measure the credibility of the data. Participants noted Grammarly's usefulness in promoting academic writing and enriching teaching and learning experiences. An awareness of ethical considerations for using Grammarly and other generative AI (GenAI)-powered writing assistant tools is essential before adopting them.

Keywords: academic writing, artificial intelligence, constructivist-interpretative perspective, exploratory mixed-methods design, Grammarly, postgraduate students

Introduction

Many generative artificial intelligence (GenAI)-powered writing tools including Wordtune, Grammarly, QuillBot, Paraphraser.io, and Copy.ai have flooded business, government, and higher education in recent times. And globally, there has been a growing interest in exposing students to these tools. As more advanced AI technologies emerge, their ability to transform academic research practices is becoming increasingly evident. According to some scholars, (e.g. Perdana et al., 2021; Schraudner, 2014), Grammarly is a widely used writing assistant

tool in academia, used primarily to detect grammatical errors in the proofreading of documents. In addition, it corrects spelling and assists with punctuation, synonyms (vocabulary usage), and plagiarism detection (Al-Inbari & Al-Wasy, 2023; Chang et al., 2021). According to Andriani et al. (2024, p. 83), Grammarly can also be used to “check for grammatical errors, correct vocabulary placement, use appropriate punctuation marks, and many more.” Schraudner (2014, p. 129) noted that Grammarly, as a writing assistant tool,

offers style-specific correction for a variety of different types of writing . . . to assess student writing samples. . . . [and also] offers “context-optimized synonyms” and . . . spelling and word choice suggestions . . . [and] plagiarism detection.

And Fahmi and Cahyono (2021, p. 19) reiterated:

Grammarly has been claimed as an easy tool that can help students and academies deal with their writing by checking the spelling, grammar, and punctuation errors. It also provides comprehensive and useful feedback, including corrections and suggestions to make the writing clearer, more precise, more effective, more readable, mistake-free, and impactful, with a high accuracy and evaluation speed rate.

Perdana et al. (2021) believed that Grammarly has numerous potential advantages for students, enabling them to perform tasks that once required advanced human literacy. Moreover, these tools can provide automated tutoring and feedback to students (Raad et al., 2023; Roe et al., 2023). The use of Grammarly and other GenAI-powered writing assistant tools has shown that students often perform better with these tools due to their interactive nature and the fact that the information is usually clearly verbally, and visually interpreted for the student, as well as being available wherever and whenever they are inclined to learn (Bozkurt, 2023; Maphoto et al., 2024; Nova, 2018). Studies have reported on the implications of using Grammarly for personalised learning and academic writing from various multidisciplinary points of view (Farazouli et al., 2023; Kelly et al., 2023).

If these are the benefits of this tool, students must be empowered to use it effectively. Research has concluded that language issues regarding punctuation, grammar, vocabulary, spelling, and coherence are the most common challenges for many postgraduate students (Hawari et al., 2022; Nova, 2018). When students start their postgraduate studies, they have to hone their academic writing skills, which remain a significant challenge (Huang et al., 2020; Yuvayapan & Bilginer, 2020). This exploratory study was conducted in a college at an open-distance e-learning (ODEL) university where master’s and doctoral students are required to complete a research proposal module as a requirement:

From 2023, the curriculum for a full research master’s and doctoral qualification comprises a dissertation or thesis only. The research proposal is incorporated into the dissertation/thesis. . . . The research master’s and doctoral candidate will be expected to work with the supervisor to have a research proposal approved during the first year of study of the dissertation or thesis. (University of South Africa, 2024, p. 27)

Only postgraduate students registered for the full Master in Education (MEd) and Philosophiae Doctor (PhD) programmes were invited to participate in this research study.

Over the past 10 years, the author has supervised postgraduate students at an ODeL university; many master's students struggle or face difficulties with spelling, punctuation, clarity in writing, sentence structure, and grammar. Several studies have confirmed that most master's and doctoral degree students' first-time draft research proposals contain grammatical, punctuation, and spelling mistakes (Prescott, 2018; Schulze & Lemmer, 2017; Singh, 2019). An observation over the years is that these supervised students were African language speakers who conveyed their ideas through "code-switching," a form of language alternation where speakers/writers alternate between their mother tongue and English as a foreign language (Rust & Nel, 2024). The challenge was that African mother-tongue speakers could not comprehend ideas or translate them through code-switching, which was detrimental to their constructive argument when writing in English as a foreign language.

The college office for graduate studies hosted several workshops to up skill postgraduate students, primarily focusing on research capacity skills, ethics, plagiarism, and academic writing. An introduction to one of the AI-powered tools for writing assistance, Grammarly, formed part of the degree course. The tool supported postgraduate students' academic writing skills and advanced their AI literacy. AI literacy is a person's ability to understand, use, monitor, and critically reflect on AI applications. In this case, after empowering postgraduate students with AI literacy, it was expected that they would use this acquired knowledge to write effective research proposals (Chiu et al., 2024; Velander et al., 2024). A study by Anis and Khalid (2024, p. 1) concurred that AI-powered tools support postgraduate students "to refine their writing style, grammar, and coherence, contributing to higher-quality academic work."

When writing this article, there was a gap in research on Grammarly as a research proposal academic writing tool as part of a degree course in an ODeL. Therefore an investigation was needed to explore the opinions of master's and doctoral postgraduate students who use Grammarly for academic writing in an online research proposal course, and the effectiveness thereof. The following research question was created: "How does Grammarly influence the grammatical accuracy of postgraduate students' writing?" Based on this question, the following research sub-questions were formulated:

- After students were empowered to use Grammarly as a writing assistant tool, were there statistically significant differences between male and female postgraduate students regarding utilising the tool in writing in an online course?
- How did Grammarly improve postgraduate students' grammatical accuracy and academic writing abilities in an online research proposal course?

Theoretical framework for the study

This exploratory mixed-methods design study was based on the dualistic theoretical framework, namely the Unified Theory of Acceptance and Use of Technology (UTAUT)

(Venkatesh et al., 2003), as well as Technology Trends Awareness (TTA). Since Venkatesh et al. reported on students' acceptance and use of technologies and the factors that impact performance, efforts, social impact, and context, several extended studies have revealed expectations associated with adopting technology. According to Venkatesh et al., a person's performance expectancy in the acceptance and use of technological tools is determined by how much technology will enable them to use that technology to improve their performance. When considering that theory as applied to this single case study, the students anticipated that using AI-powered writing assistant tools would affect their academic writing, design, and chat prompts in an online course. TTA is based on the notion that an individual is tech-savvy and has the digital literacy proficiency to use or apply new AI-powered tools in practice. The currently registered postgraduate students are mindful or aware of the latest developments in technologies and the types of AI-powered tools available for teaching and learning. Some of these students are tech-savvy. The participating students were empowered, exposed, and aware of the application of new AI technologies in the online course, making it easier to use them.

Literature review

The launch of the most famous GenAI tool, ChatGPT-3.5 and recently, the updated version, ChatGPT-4.0, with which Grammarly can be used for paraphrasing, has exponentially changed the landscape in education. Therefore, an interest in GenAI-powered tools in the education literature has emerged, with many studies reporting their potential to enrich and promote students' learning experiences. Several studies have found pedagogical advantages for lecturers and students using GenAI-powered tools in their teaching and learning practices (Bozkurt, 2023; Farazouli et al., 2023; Kelly et al., 2023). With the available technology in GenAI, it is now possible to generate and abbreviate personalised explanations that meet the specific needs of individuals. This is beneficial for improving students' academic writing and critical thinking.

Studies report that Grammarly is the most used AI-powered writing assistant tool of all similar software tools on the market (Alam et al., 2023; Fitria, 2021; Perdana et al., 2021). Grammarly is software used as a writing aid to assist students in checking for grammatical errors, spelling mistakes, punctuation, and style of writing (Alam et al., 2023; Crawford et al., 2023; Faisal & Carabella, 2023). A basic understanding of the functionality and use of Grammarly is essential for students who are not conversant in English. A significant advantage of this AI-powered tool is its ability to track students' work for possible academic fraud and plagiarism. The software thus helps eliminate fraud and academic dishonesty, improving the quality of students' academic writing.

Literature has reported that using Grammarly and other GenAI tools for academic writing could increase undergraduate and postgraduate students' writing skills. Grammarly is an AI-powered writing assistant tool designed to help students develop better writing skills through offering feedback on student's writing skills (Nguyen et al., 2024; Roe et al., 2023). Doing an online research proposal course and using Grammarly as a writing tool has created learning

opportunities for students to improve their academic performance (Alotaibi, 2023; Kelly et al., 2023). Moreover, Faisal and Carabella (2023) argued that by using Grammarly, students automatically comprehend the mistakes they made when writing a report and learn how to fix them.

Globally, the supervision of postgraduate students remains a challenge, as many students lack writing and AI literacy skills, which are requirements for pursuing postgraduate studies (ONeill & Russell, 2019). Another GenAI tool—in this instance, a prompt writing tool—is Quillbot, a powerful tool for academic writing that provides advanced technology and offers students new approaches to learning academic writing. Such tools grant education students a basic understanding of how, in turn, to teach technology to their learners. According to Salinas-Navarro et al. (2024), this tool can enhance experiential learning for authentic assessment. The hype around AI tools has grown exponentially as Grammarly is increasingly being used for its pedagogical advantages, with high rates of student acceptance (Strzelecki, 2023) for developing better writing skills (Raad et al., 2023; Roe et al., 2023), and for supporting essay writing (Chiu et al., 2023; Crawford et al., 2024).

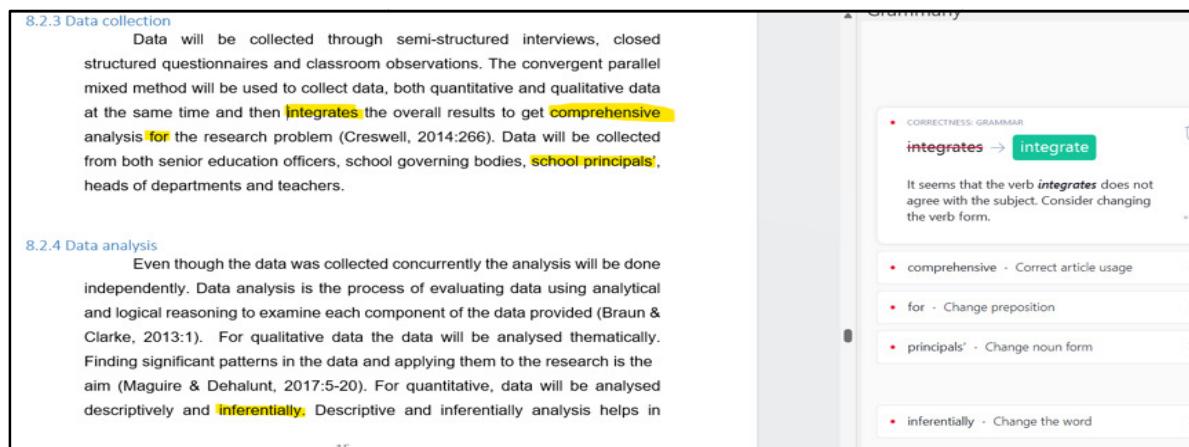
Choi (2012, p. 74) viewed GenAI-powered tools for academic writing as a “multifaceted undertaking encompassing cognitive, social, ethical and social dimension” process. On the other hand, concerns have been raised about potential security risks, which may lead to misuse of user data and phishing. Grammarly as a widely used software for enhancing postgraduate student academic writing has a few limitations. First, many students are dependent, evincing an over-reliance on the tool (Narayan, 2024; Thangthong et al., 2024). The real risk is that students will become over-reliant on Grammarly, crippling their academic writing and editing abilities long before graduation. Studies have reported that some GenAI-powered tools have limited accuracy, and grammar errors were revealed on Grammarly; it can sometimes also make mistakes on more complicated issues or suggest inaccurate solutions, typically with technical or specialised writing (Elkhatat et al., 2023; Weber-Wulff et al., 2023). For some GenAI-powered tools, contextual limitations gave rise to the inappropriate correctness of the generated content.

Another disadvantage is that the premium version of Grammarly is expensive. This is a form of digital divide and exclusion of poor students (Halaweh, 2023). On the downside, the GenAI-powered tools might exacerbate the ethical and privacy issues of the postgraduates (Uzun, 2023). Another risk is the potential use of GenAI for creating lies and misleading information, compromising trust and authenticity in digital communications. A Bangladeshi study by Islam and Shuford (2024) has surveyed the ethical use of GenAI-powered tools related to bias and fairness. Additionally, studies have revealed that ethical dilemmas with GenAI—*inherent biases in algorithms and surveillance threats—compromise human dignity and privacy* (Camilleri, 2024; Holmsen, 2024). A Turkish study by Huriye (2023, p. 42) on ethical dilemmas reported “that bias, privacy, accountability and transparency are the main ethical concerns surrounding the development and use of AI technology in developed countries.” Thus, GenAI-powered tools could positively or negatively affect postgraduate students.

Postgraduate students in this study were registered for a master's or doctoral degree and had to complete a research proposal module before pursuing the degree. The research proposal for a master's or doctoral degree study is compiled over six months. Many of these students struggled with or encountered difficulties in writing a research proposal, being unprepared particularly in terms of academic writing skills (Cisco, 2020; Ivanova, 2020). Most students struggled with spelling, punctuation, writing style, grammar, and sentence structure despite progressing to the degree programme's research proposal stage. The majority of these students tend to be African-language speakers, not English. As a college of education at the university, academic writing was integrated into all sessions devoted to the research proposal to address this issue. Students attended monthly online Microsoft (MS) Teams videoconference sessions on issues such as the title of the research proposal course and searching for a topic. Writing the statement of the problem, formulating research questions, outlining the research methodology, adhering to ethical requirements, and writing for an academic readership all received attention. The academic writing sessions are structured as a theory-in-practice approach. Students are chosen to present their sections of the research proposals during MS Teams meetings for peer and lecturer evaluation. Constructive feedback is given. This is a valuable addition to the sessions in academic writing and improving the presentation skills of postgraduate students (see Figure 1).

Figure 1

Research proposal (Grammarly screenshot) by a MEd student



The screenshot shows a Microsoft Word document with Grammarly integration. The document contains two sections: '8.2.3 Data collection' and '8.2.4 Data analysis'. The 'Data collection' section discusses data collection methods and analysis. The 'Data analysis' section discusses the process of evaluating data using analytical and logical reasoning. On the right side of the screen, the Grammarly interface is visible, showing suggestions for 'integrates', 'comprehensive', 'for', 'school principals', and 'inferentially'.

8.2.3 Data collection
 Data will be collected through semi-structured interviews, closed structured questionnaires and classroom observations. The convergent parallel mixed method will be used to collect data, both quantitative and qualitative data at the same time and then **integrates** the overall results to get **comprehensive** analysis **for** the research problem (Creswell, 2014:266). Data will be collected from both senior education officers, school governing bodies, **school principals**, heads of departments and teachers.

8.2.4 Data analysis
 Even though the data was collected concurrently the analysis will be done independently. Data analysis is the process of evaluating data using analytical and logical reasoning to examine each component of the data provided (Braun & Clarke, 2013:1). For qualitative data the data will be analysed thematically. Finding significant patterns in the data and applying them to the research is the aim (Maguire & Dehalant, 2017:5-20). For quantitative, data will be analysed descriptively and **inferentially**. Descriptive and inferentially analysis helps in

Grammarly

- CORRECTNESS: GRAMMAR**
integrates → **integrate**
 It seems that the verb **integrates** does not agree with the subject. Consider changing the verb form.
- comprehensive** - Correct article usage
- for** - Change preposition
- principals'** - Change noun form
- inferentially** - Change the word

Methodology

Ethical clearance was obtained from the college ethics committee (reference #2023/05/13/90178912/18/AM), to conduct this study at the College of Education at the ODeL university. For the 2023 academic year, 102 postgraduate students were registered for the full Master in Education (MEd) and Philosophiae Doctor (PhD) programmes, and 34 postgraduate (MEd & PhD) students (33.3%) participated in this study. This single case study's research paradigm and design employed a pragmatic approach. A pragmatic approach and mixed-methods design (Creswell, 2013) are the most appropriate for a study to determine how Grammarly influences the grammatical accuracy of postgraduate students' writing. Pragmatism allows researchers to use mixed methods, techniques, and procedures that best

address the research questions. This flexibility is crucial when dealing with complex problems that cannot be fully understood through a single method. Pragmatic research focuses on the practical implications of the findings. It emphasises what works in real-world settings, making the results more applicable and actionable. Pragmatic researchers can adapt their methods as the research progresses, responding to new insights and changing circumstances. With a pragmatic approach, researchers can ensure that their studies are methodologically sound and practically relevant, ultimately leading to more impactful and meaningful findings. Based on this justification, the quantitative and qualitative data were analysed, interpreted, and compared as a scientific acid test for data triangulation, content validation, and trustworthiness.

The sample was selected from the registered postgraduate MEd and PhD students. During the first data collection stage, 34 postgraduate student teachers (male = 13; female = 21) completed the signed consent form and, later, a self-structured questionnaire. Reliability was calculated from the self-structured questionnaire using a four-point Likert scale. The Cronbach alpha coefficient was used to calculate the reliability after the data were collected ($\alpha < .89$). If participants felt uncomfortable during the study, they could withdraw at any stage. Descriptive data were computed for the t-test, independent sampled t-test, and cross-tabulations. For the second stage of the data-collection process, a qualitative approach was used for semi-structured online interviews with six individuals (MEd1–3; PhD1–3). Semi-structured online interviews were conducted on MS Teams as the virtual videoconferencing platform. Before the beginning of the interview sessions, the purpose of the study was explained, recorded, transcribed, and downloaded.

Before the data analysis process, codes were captured on the Grammarly Project; then, the AI-powered qualitative data analysis software, NVivo 14 (<https://lumivero.com/>), was used. All interview data sets were imported into the NVivo software. The data-analysis process followed five steps: (1) become familiar with the narratives of participants, as captured in the learning journals, (2) code (names) the narratives as a data set (e.g. MEd1), (3) use the NVivo software to generate (drill into narratives) themes linked to specific extracts of participants (e.g. PhD1), (4) reflect and review some of the themes linked to extracts of the participants, (5) define and finalise the identified themes.

Trustworthiness is an essential scientific acid test to measure credibility, transferability, dependability, and conformability. All the interview transcripts, MS Teams recordings, and generated NVivo themes linking to specific extractions (verbatim) from participants were sent to each of them to verify and validate the trustworthiness of the identified themes. To ensure the integrity of the data sets and identify themes, the participation validation (member checking) process was used to measure that the interviewed data were trustworthy (Nowell et al., 2017).

Quantitative results

In this section, the students' views on Grammarly for academic writing are reported on.

Postgraduate students' use of Grammarly for grammatical accuracy in academic writing

Table 1

Grammarly writing tool for grammatical accuracy (n = 34)

	Do you agree or disagree with using the writing tool as an assistant in academic writing?	Gender		Mean	Std. Dev.	t	Sig. value
1.1	It is a tool for correcting grammatical and spelling errors in the academic writing style.	Male	13	3.78	1.19	0.28	0.67
		Female	21	3.13	1.09		
1.2	It clarifies the meaning of concepts and increases the readability of the text in my academic writing.	Male	13	3.61	1.38	- 1.32	0.59
		Female	21	3.34	1.45		
1.3	It is an appropriate grammar tool to be used for my academic writing.	Male	13	3.67	1.39	0.29	0.59
		Female	21	3.94	0.89		
1.4	It offers helpful suggestions to support my academic writing style.	Male	13	3.46	1.14	- 0.23	0.72
		Female	21	3.33	1.29		
1.5	It gives instant feedback on my writing and tracks possible plagiarism in academic writing.	Male	13	3.57	1.19	0.88	0.56
		Female	21	3.18	1.26		
1.6	It helps me write concisely and has faster corrections than other grammar checker tools.	Male	13	3.67	1.10	- 1.04	0.89
		Female	21	3.36	1.20		
1.7	Facilitates collaborative writing with ease and increases confidence in using the tool.	Male	13	3.61	1.36	0.30	0.65
		Female	21	3.81	0.94		
1.8	It improves sentence construction and increases the vocabulary of my academic writing skills.	Male	13	3.53	1.28	- 1.10	0.51
		Female	21	3.28	1.19		

	Do you agree or disagree with using the writing tool as an assistant in academic writing?	Gender		Mean	Std. Dev.	t	Sig. value
1.9	It helps in real-time writing and provides valuable suggestions for improving my writing style.	Male	13	3.18	1.25	-1.56	0.55
		Female	21	3.35	1.13		
1.10	It supports my personal writing goals in the research proposal.	Male	13	3.89	1.45	0.32	0.76
		Female	21	3.75	1.29		
1.11	It is an effective and supportive tool for paraphrasing text.	Male	13	3.69	1.18	-1.22	0.59
		Female	21	3.36	1.05		
1.12	It offers suitable substance based on the context of one's writing style in the research proposal	Male	13	3.49	1.39	-1.12	0.50
		Female	21	3.52	1.11		
1.13	It is currently the best proofreading software tool and gives value for money as a paraphrased writing tool	Male	13	3.88	1.19	-1.22	0.59
		Female	21	3.89	1.12		
1.14	It teaches about writing clearly and empowers you with grammar and paraphrasing skills.	Male	13	3.89	1.05	0.24	0.57
		Female	21	3.79	1.35		
1.15	It is a paraphrasing tool and assists in writing the research proposal	Male	13	3.63	1.29	0.29	0.68
		Female	21	3.65	1.32		

Table 1 demonstrates that both male and female postgraduate students had favourable views and experiences with Grammarly when using it for academic writing in an online course. The male students agreed that Grammarly is an effective tool for correcting grammatical and spelling errors in academic writing style, with a mean and standard deviation of 3.78 and 1.19, respectively. The female students agreed with a mean of 3.13 and a standard deviation of 1.09. Therefore, both male and female students strongly believed in the effectiveness of Grammarly for academic writing. The group differences were insignificant ($t = 0.28$; $p > 0.67$). The female respondents strongly agreed that it is an appropriate tool for academic writing ($M = 3.94$, $SD = 0.89$), compared to the males ($M = 3.67$, $SD = 1.39$). The t value and the significance level for this item indicated that the difference between males and females was not statistically significant ($t = 0.29$; $p > 0.59$). The male postgraduate participants ($M = 3.89$, $SD = 1.45$) and female participants ($M = 3.75$, $SD = 1.29$) agreed that the use of Grammarly supported their personal writing goals in the research proposal ($t = 0.32$, $p > 0.76$). Concerning the statement that Grammarly facilitates collaborative writing with ease and increases confidence in using the tool, both sets of respondents agreed (male: $M = 3.61$, $SD = 1.3618$; female: $M = 3.81$, $SD = 0.94$; $t = 0.30$, $p > 0.65$). Finally, most female

respondents expressed positive sentiments that Grammarly is a paraphrasing tool and assists in academic writing ($M = 3.65$, $SD = 1.32$).

Sampled differences between male and female views and experiences on using Grammarly in the online course are recorded in Table 2.

Table 2

Grammarly influences grammatical accuracy in the research proposal course ($n = 34$)

Grammarly Writing Tool	Gender	N	Mean	Std. Deviation	Std. Error Mean
Contextual spelling	Male	13	3.3	1.09	0.24
	Female	21	3.4	1.32	0.18
Grammar correctness	Male	13	3.6	1.06	0.13
	Female	21	3.1	1.45	0.11
Punctuation	Male	13	3.4	1.23	0.14
	Female	21	3.7	1.34	0.21
Sentence structure	Male	13	3.1	1.23	0.14
	Female	21	3.5	1.34	0.11
Clarity in style of writing	Male	13	3.3	1.13	0.23
	Female	21	3.0	1.44	0.20

The group means for the use of Grammarly in the course, reflected in Table 2, is that the female respondents used Grammarly for contextual spelling ($M = 3.4$, $SD = 1.32$), punctuation ($M = 3.7$, $SD = 1.34$) and sentence structure ($M = 3.5$, $SD = 1.34$), more so than their male counterparts. However, the male respondents predominantly used it for clarity in writing style ($M = 3.3$, $SD = 1.13$).

Table 3

Independent sampled t-test of the use of Grammarly as a grammatical accuracy tool in the online research proposal course

Levene's Test for the Equality of Variances					t-test for Equal Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error diff.	95% confidence interval of the difference
								Lower	Upper
Grammatical accuracy of Grammarly as a writing tool	Equal variances assumed	0.42	0.54	0.59	119	0.44	-0.26	0.30	-0.84 0.43

A sampled t-test (Table 3) was computed to measure whether any statistically significant differences emerged between male and female respondents. It showed positive results, with the respondents agreeing that Grammarly is an effective writing assistant tool. The t-test revealed that the t-value was 0.59 between the mean of the two groups.

Qualitative findings

Specific themes were generated by the qualitative data analysis software NVivo 14. The identified themes linked to each participant about Grammarly as an AI-powered writing assistant tool were as follows:

- Students leveraged the Grammarly tool for optimal grammatical accuracy writing experiences.
- Students were optimistic about Grammarly as a partner in academic writing.
- Students viewed Grammarly as easy to use, supportive, and advantageous in writing.
- Students viewed Grammarly as an AI tool that facilitates a collaborative writing experience that increases confidence.

Students leveraged the Grammarly tool for optimal grammatical accuracy writing experiences

The participants noted that the university included Grammarly as a helpful tool in the data bundles. They leveraged the AI-powered tools provided to enhance their learning experiences in the online course and were encouraged to use this writing tool in the course. The participants agreed that Grammarly was easy to use and a favourite among the tools. As part of the module, the free Grammarly GenAI-powered tool was used. As one student stated:

Grammarly is free, easy to use, and most commonly used. Moreover, the helpful advice provided to me was cost-effective. The tool is very helpful... [it] helps me improve my grammatical accuracy in academic writing, particularly illuminating grammar errors. (Male, MEd2)

Another participant said:

Grammarly has been promoted at our university. I am thankful for the support we have received as students. I felt empowered after all the academic writing sessions on MS Teams. It is the best paraphrasing tool. It increases the use and support of my grammatical accuracy in written text. It is highly effective. It showed when I had plagiarised text in my writing. It only [benefited] my writing. (Female, PhD3)

Students were optimistic about Grammarly as a partner in academic writing

The participants had positive experiences with the frequent and everyday use of the Grammarly tool. Most expressed confidence, remarking that the tool was valuable for their course. This student expressed the following sentiments:

After being exposed to this tool, I frequently used Grammarly as my writing partner. Most of the time, it helps me with the paraphrasing and revision process of writing my research proposal. Grammarly improves my sentence construction and increases my grammar vocabulary, but overall, my academic writing skills have improved significantly. I felt confident in the quality of my academic writing. (Female MEd1)

Another student said that she appreciated the quick responses from Grammarly, which built confidence in her academic writing. Yet another participant stated:

Grammarly is my writing partner. Grammarly provided accurate suggestions [where I was] making mistakes. I like the instant feedback on my writing. I noticed that Grammarly tracks possible plagiarism in academic writing. It is so helpful. (Male, PhD2)

Grammarly fixes my grammar mistakes, provides valuable suggestions or alternative words of choice, and incorrectly uses words in my writing style. (Female, MEd3)

Students viewed Grammarly as easy to use, supportive, and advantageous for writing

During the interview sessions, the participants were excited and positive about their experiences with the different GenAI-powered tools, particularly Grammarly, a tool for academic writing. Participants said they viewed Grammarly as an academic writing assistant tool that improved and supported their writing ability. As this participant said:

Grammarly is straightforward to use after I was empowered with the tool. I can now use it and observe how I have grown in my writing. I like this invaluable tool. (Male, MEd1)

A participant prescribed Grammarly as a valuable tool for optimal writing:

I prefer Grammarly. It has exposed me to my grammatical mistakes and helped me to improve my writing skills. This created confidence in my writing. (Female, PhD2)

Students experienced Grammarly as an AI-powered tool that facilitates a collaborative writing experience that enhances confidence

I was sure I could write my proposal but was surprised at how many grammatical errors were in my draft research proposal. This was a real wake-up call. Since I started using Grammarly in the course, it has promoted interaction with the paraphrasing tool, which is clear and understandable for my online course. It instils confidence in me as a writer. (Male, PhD1)

Most participants identified Grammarly as their preferred writing assistant tool in the course.

I like Grammarly. This tool is effective for achieving optimal writing. It enhances my academic writing abilities, and [I] benefit . . . from using the tool in my course. I am an African-language speaker. It is sometimes difficult to express my thoughts. I used mainly code-switching. I always need help to write well. It enabled me to possess AI literacy skills. (Male, PhD3)

Discussion of findings

As mentioned in the literature review, the theoretical frames of awareness of UTAUT and TechTrends and their integration as pragmatic approaches supported the performance expectation of the participants' acceptance and use of GenAI-powered tools in an online course. The mixed-method design found that Grammarly enabled them to apply AI technology to improve the grammatical accuracy and academic writing skills of the postgraduate students in the course. Previous studies had noted the importance of Grammarly when used in teaching and learning in contact and blended contexts, but very little was found in the literature on Grammarly in online contexts (Farazouli et al., 2023; Kelly et al., 2023; Raad et al., 2023). The results of this exploratory study contributed to the understanding and application of Grammarly in particular, because no data could be found on Grammarly as used for academic writing in an ODeL context. The findings supported the views of scholars who argue that these tools can be used to cater for a larger student population, adopted for individual learning, and facilitate access to students (Ding et al., 2023; Koka et al., 2023; Ruksana, 2024; Salinas-Navarro et al., 2024).

The current study found that the postgraduate student participants had favourable views and experiences with Grammarly as an AI-powered writing assistant tool. One participant (male, PhD3) confirmed that "This tool is effective for achieving optimal writing. It enhances my academic writing abilities, and [I benefit] from using the tool in my course." For them, Grammarly was an academic writing tool that partnered with or assisted them in research proposal writing an as an effective tool to enhance their writing skills. Moreover, students agreed that Grammarly is an effective writing tool and made collaborative learning easy to pursue in the course.

Furthermore, Nguyen and Hoang (2023) concurred that Grammarly could be an effective tool designed to help students develop better writing skills through paraphrasing, especially for

postgraduate students who are African language (non-English) speakers (Ghufron & Rosyida, 2018; Hakiki, 2021). In the study participants' views, using GenAI-powered tools proved valuable, and using tools such as Grammarly was cost-effective and free, enhancing their academic writing abilities. Scholars noted that GenAI-powered tools (in particular Grammarly) help with paraphrasing, correct grammatical errors, provide instant feedback, and build confidence (Donlon & Tiernan, 2023; Hakiki, 2021; Luo, 2024). But Amoozadeh et al. (2024) opined that trust in GenAI-powered tools for future use in academia is ultimately to be determined because the yardsticks for accepting work by students and academics who rely on these tools must be included in university policies.

Grammarly and other GenAI tools reportedly had pedagogical advantages for academic writing (Alotaibi, 2023; Faisal & Carabella, 2023), yet only a few studies interrogated the effectiveness of GenAI-powered tools in teacher education (Dwivedi et al. 2023; Farazouli et al., 2023; Kelly et al., 2023; Strzelecki, 2023). The current study results showed no significant differences between male and female participants' views on using this GenAI-powered writing assistant tool as an aid for writing in the online course. Grammarly has influenced the lived experiences of postgraduate students, granting them more free time to focus on their academic writing.

In conclusion, it is noted that this study focuses on Grammarly as a tool to enhance the grammatical accuracy of postgraduate students' writing. Therefore, it is worth mentioning that several studies have reported drawbacks of GenAI-powered tools, such as over-reliance, ethics, cyber security, bias, and privacy issues (Camilleri, 2024; Holmsen, 2024; Huriye, 2023; Uzun, 2023).

Conclusion

The study aimed to determine how Grammarly, as an AI-powered writing assistant tool, supports the grammatical accuracy of postgraduate students' (primarily African language speakers) academic writing in an online research proposal course. The study demonstrated that Grammarly improved the grammatical accuracy of postgraduate students' writing style and sentence construction, identified grammatical errors, corrected punctuation, and helped avoid plagiarism. Furthermore, using GenAI-powered technology to empower postgraduates' research proposal writing improved their academic writing proficiency and digital literacy skills in the online course. The results revealed no statistically significant difference between male and female postgraduate students using Grammarly to improve the writing of their research proposals. It emerged that the AI-powered tool positively improved the participating students' proficiency in writing and paraphrasing text, helping to prevent them from plagiarising as they compiled their research proposal.

This study significantly contributes to advancing the growing knowledge on Grammarly as writing assistant software that empowers postgraduate students to write better and avoid plagiarism in an online postgraduate course. The study developed a survey validated and developed as a highly reliable ($\alpha < .89$) data-collection instrument. It is suggests that this instrument could be used in different contexts for similar courses. Furthermore, it is

recommended that the university revise policies on using GenAI-powered writing tools. These tools—Grammarly in particular—offer invaluable assistance to African language-speaking students in enhancing their English academic writing skills. From a practical and policy perspective, the findings could be applied to undergraduate modules, helping to prepare student teachers for future postgraduate studies.

Furthermore, it is vital to take note of the ethical considerations regarding using Grammarly and other GenAI-powered tools. Further research is needed to build on recent gains in academic awareness of their use for teaching and learning. This research aimed not to explore any ethical dilemmas with Grammarly, but how the tool influences the grammatical accuracy of postgraduate students' writing. Further research should investigate ethics, biases, and data privacy using GenAI-powered tools in postgraduate courses. The findings of this small sampled exploratory mixed-methods design study cannot be generalised. Therefore, a more extensive study must be undertaken, which may well yield different results.

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References

Alam, S., Usama, M., Alam, M. M., Jabeen, I., & Ahmad, F. (2023). Artificial intelligence in global world: A case study of Grammarly as e-tool on ESL learners' writing of Darul Uloom Nadwa. *International Journal of Information and Education Technology*, 13(11), 1741–1747. <https://doi.org/10.18178/ijiet.2023.13.11.1984>

Al-Inbari, F. A. Y., & Al-Wasy, B. Q. M. (2023). The impact of automated writing evaluation (AWE) on EFL learners' peer and self-editing. *Education and Information Technologies*, 28(6), 6645–6665. <https://doi.org/10.1007/s10639-022-11458-x>

Alotaibi, A. H. E. (2023). The impact of AI-powered Grammarly on enhancing grammar proficiency among Saudi EFL students. *Remittances Review*, 8(4). <https://doi.org/10.33182/rr.v8i4.256>

Amoozadeh, M., Daniels, D., Nam, D., Kumar, A., Chen, S., Hilton, M., Ragavan, S. S., & Alipour, M. A. (2024). Trust in generative AI among students: An exploratory study. *Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 1* (pp. 67–73). SIGCSE. <https://doi.org/10.1145/3626252.3630842>

Andriani, L., Syahriani, R., & Aradhanawaty, S. (2024). Students' perceptions toward the feedback of Grammar Checker on English foreign language (EFL) writing class. *Mataoleo: Journal of English Education and Linguistics*, 1(1), 81–100. <https://journal.umkendari.ac.id/index.php/mataoleo/article/view/473>

Anis, N., & Khalid, B. (2024). *Teachers' and students' perception of the effects of using ChatGPT, Grammarly, and Quillbot on students' writing skills* [Doctoral dissertation, Abdalhafid Boussouf University Center of Mila]. Digital Repository Abdalhafid Boussouf University Center of Mila. <https://dspace.centre-univ-mila.dz/jspui/handle/123456789/3481>

Bozkurt, A. (2023). Generative artificial intelligence (AI) powered conversational educational agents: The inevitable paradigm shift. *Asian Journal of Distance Education*, 18(1). <http://www.asianjde.com/ojs/index.php/AsianJDE/article/view/718>

Camilleri, M. A. (2024). Artificial intelligence governance: Ethical considerations and implications for social responsibility. *Expert systems*, 41(7), e13406. <https://doi.org/10.1111/exsy.13406>

Chang, T. S., Li, Y., Huang, H. W., & Whitfield, B. (2021). Exploring EFL students' writing performance and their acceptance of AI-based automated writing feedback. *Proceedings of the 2021 2nd International Conference on Education Development and Studies* (pp. 31–35). ICEDS. <https://doi.org/10.1145/3459043.3459065>

Chiu, T. K., Ahmad, Z., Ismailov, M., & Sanusi, I. T. (2024). What are artificial intelligence literacy and competency? A comprehensive framework to support them. *Computers and Education Open*, 6, 100171. <http://dx.doi.org/10.1016/j.caeo.2024.100171>

Chiu, T. K., Moorhouse, B. L., Chai, C. S., & Ismailov, M. (2023). Teacher support and student motivation to learn with artificial intelligence (AI) based chatbot. *Interactive Learning Environments*, 35(1), 1–17. <https://doi.org/10.1080/10494820.2023.2172044>

Choi, Y. H. (2012). Paraphrase practices for using sources in L2 academic writing. *English Teaching*, 67(2), 51–79. <https://doi.org/10.15858/engtea.67.2.201207.51>

Cisco, J. (2020). Exploring the connection between impostor phenomenon and postgraduate students feeling academically unprepared. *Higher Education Research & Development*, 39(2), 200–214. <https://doi.org/10.1080/07294360.2019.1676198>

Crawford, J., Cowling, M., Ashton-Hay, S., Kelder, J. A., Middleton, R., & Wilson, G. S. (2023). Artificial intelligence and authorship editor policy: ChatGPT, Bard Bing AI, and beyond. *Journal of University Teaching & Learning Practice*, 20(5), 1–13. <https://doi.org/10.53761/1.20.5.01>

Crawford, L. M., Hendzlik, P., Lam, J., Cannon, L. M., Qi, Y., DeCaporale-Ryan, L., & Wilson, N. A. (2024). Digital ink and surgical dreams: Perceptions of artificial intelligence-generated essays in residency applications. *Journal of Surgical Research*, 301, 504–511. <https://doi.org/10.1016/j.jss.2024.06.020>

Creswell, J. W. (2013). *Steps in conducting a scholarly mixed methods study* (DBER Speaker Series, 48). University of Nebraska Lincoln.
<https://digitalcommons.unl.edu/dberspeakers/48>

Ding, L., Li, T., Jiang, S., & Gapud, A. (2023). Perceptions of students of using ChatGPT in a physics class as a virtual tutor. *International Journal of Educational Technology in Higher Education*, 20, 63. <https://doi.org/10.1186/s41239-023-00434-1>

Donlon, E., & Tiernan, P. (2023). Chatbots and citations: An experiment in academic writing with generative AI. *Irish Journal of Technology Enhanced Learning*, 7(2), 75–87.
<https://doi.org/10.22554/ijtel.v7i2.125>

Dwivedi, Y. K., Sharma, A., Rana, N. P., Giannakis, M., Goel, P., & Dutot, V. (2023). Evolution of artificial intelligence research in *Technological Forecasting and Social Change*: Research topics, trends, and future directions. *Technological Forecasting and Social Change*, 192, 122579. <https://doi.org/10.1016/j.techfore.2023.122579>

Elkhatat, A. M., Elsaied, K., & Almeer, S. (2023). Evaluating the efficacy of AI content detection tools in differentiating between human and AI-generated text. *International Journal for Educational Integrity*, 19(1), 17. <https://doi.org/10.1007/s40979-023-00140-5>

Fahmi, M. A., & Cahyono, B. Y. (2021). EFL students' perception on the use of Grammarly and teacher feedback. *JEES: Journal of English Educators Society*, 6(1), 18–25.
<https://doi.org/10.21070/jees.v6i1.849>

Faisal, F., & Carabella, P. A. (2023). Utilizing Grammarly in an academic writing process: Higher education students' perceived views. *Journal of English Language Teaching and Linguistics*, 8(1), 23–42. <http://dx.doi.org/10.21462/jeltl.v8.i1.1006>

Farazouli, A., Cerratto-Pargman, T., Bolander-Laksov, K., & McGrath, C. (2023). Hello GPT! Goodbye home examination? An exploratory study of the impact of AI chatbots on university teachers' assessment practices. *Assessment & Evaluation in Higher Education*, 49(3), 1–13. <https://doi.org/10.1080/02602938.2023.2241676>

Fitria, T. N. (2021). Grammarly as AI-powered English writing assistant: Students' alternative for writing English. *Metathesis: Journal of English Language, Literature, and Teaching*, 5(1), 65–78. <https://doi.org/10.31002/metathesis.v5i1.3519>

Ghufron, M. A., & Rosyida, F. (2018). The role of Grammarly in assessing English as a foreign language (EFL) writing. *Lingua Cultura*, 12(4), 395–403.
<http://dx.doi.org/10.21512/lc.v12i4.4582>

Hakiki, G. N. R. (2021). Perception of EFL students on the use Grammarly application in writing class. *Eduvelop: Journal of English Education and Development*, 4(2), 99–106. <https://doi.org/10.31605/eduvelop.v4i2.891>

Halaweh, M. (2023). ChatGPT in education: Strategies for responsible implementation. *Contemporary educational technology*, 15(2).
<http://dx.doi.org/10.30935/cedtech/13036>

Hawari, O. M. D. A., Al-Shboul, Y., & Huwari, I. F. (2022). Supervisors' perspectives on graduate students' problems in academic writing. *European Journal of Educational Research*, 11(1), 545–556. <https://doi.org/10.12973/eu-jer.11.1.545>

Holmsen, S. H. (2024). *Ethical perceptions in AI literacy: A comparative study of privacy and bias in generative artificial intelligence and recommender systems* [Master's thesis, Norwegian University of Science & Technology]. <https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/3155932>

Huang, H. W., Li, Z., & Taylor, L. (2020, May). The effectiveness of using Grammarly to improve students' writing skills. *Proceedings of the 5th International Conference on Distance Education and Learning* (pp. 122–127). ICDEL.
<https://doi.org/10.1145/3402569.3402594>

Huriye, A. Z. (2023). The ethics of artificial intelligence: Examining the ethical considerations surrounding the development and use of AI. *American Journal of Technology*, 2(1), 37–44. <http://dx.doi.org/10.58425/ajt.v2i1.142>

Ivanova, I. N. (2020). Making sense of research: University students' difficulties in writing academic summaries. *Studies in Linguistics, Culture, and FLT*, 8(1), 16–34.
<http://dx.doi.org/10.46687/SILC.2020.v08i01.002>

Kelly, A., Sullivan, M., & Strampel, K. (2023). Generative artificial intelligence: University student awareness, experience, and confidence in use across disciplines. *Journal of University Teaching & Learning Practice*, 20(6), 12.
<https://doi.org/10.53761/1.20.6.12>

Koka, N. A., Khan, A. S., & Jan, N. (2023). Exploring the attitudes and perceptions of foreign language lecturers on artificial intelligence-driven writing evaluation and feedback tools for improving undergraduate writing skills. *Journal of Southwest Jiaotong University*, 58(5). <https://doi.org/10.35741/issn.0258-2724.58.5.6>

Luo, Q. (2024). EMI teachers' attitudes and approaches towards grammar error and professional development perspectives in Chinese higher education. *International Journal of Social Sciences and Public Administration*, 3(3), 12–23. <https://doi.org/10.62051/ijsspa.v3n3.02>

Maphoto, K. B., Sevnarayan, K., Mohale, N. E., Suliman, Z., Ntsopi, T. J., & Mokoena, D. (2024). Advancing students' academic excellence in distance education: Exploring the potential of generative AI integration to improve academic writing skills. *Open Praxis*, 16(2), 142–159. <https://doi.org/10.55982/openpraxis.16.2.649>

Narayan, S. (2024). Awareness and familiarity with AI writing tools among media students. *LinguaEducare: Journal of English and Linguistic Studies*, 1(1), 39–50.

Nguyen, A., Hong, Y., Dang, B., & Huang, X. (2024). Human–AI collaboration patterns in AI-assisted academic writing. *Studies in Higher Education*, 49(5), 847–864. <https://doi.org/10.1080/03075079.2024.2323593>

Nguyen, T. T. H., & Hoang, T. T. H. (2023). Exploring the use of adaptive learning technology in higher education writing classes: Students' perspectives. *VNU Journal of Foreign Studies*, 39(4), 16–38. <https://doi.org/10.63023/2525-2445/jfs.ulis.5082>

Nova, M. (2018). Utilizing Grammarly in evaluating academic writing: A narrative research on EFL students' experience. *Premise: Journal of English Education and Applied Linguistics*, 7(1), 80–96. <https://doi.org/10.24127/pj.v7i1>

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1–15. <http://dx.doi.org/10.1177/1609406917733847>

ONeill, R., & Russell, A. (2019). Stop! Grammar time: University students' perceptions of the automated feedback program Grammarly. *Australasian Journal of Educational Technology*, 35(1), 42–56. <https://doi.org/10.14742/ajet.3795>

Perdana, I., Manullang, S. O., & Masri, F. A. (2021). Effectiveness of online Grammarly application in improving academic writing: Review of experts' experience. *International Journal of Social Sciences*, 4(1), 122–130. <https://doi.org/10.31295/ijss.v4n1.1444>

Prescott, F. J. (2018). In at the deep end: The struggles of first-year Hungarian university students adapting to the requirements of written academic discourse in an EFL context. *University Writing in Central and Eastern Europe: Tradition, Transition, and Innovation*, 16(2), 167–188. https://doi.org/10.1007/978-3-319-95198-0_12

Raad, B., Anjum, F., & Ghafar, Z. (2023). Exploring the profound impact of artificial intelligence applications (Quillbot, Grammarly and ChatGPT) on English academic writing: A systematic review. *International Journal of Integrative Research (IJIR)*, 1(10), 599–622. <http://dx.doi.org/10.59890/ijir.v1i10.366>

Roe, J., Renandya, W. A., & Jacobs, G. M. (2023). A review of AI-powered writing tools and their implications for academic integrity in the language classroom. *Journal of English and Applied Linguistics*, 2(1), 3. <https://doi.org/10.59588/2961-3094.1035>

Ruksana, P. R. (2024). AI-driven pedagogy: Unveiling ChatGPT's influence in education. *Journal of Applied Science, Engineering, Technology and Management*, 2(1), 9–14. <https://doi.org/10.61779/jasetm.v2i1.2>

Rust, M., & Nel, J. (2024). The helpfulness of code-switching in teaching Afrikaans as a first additional language. *Southern African Linguistics and Applied Language Studies*, 1–19. <https://doi.org/10.2989/16073614.2023.2244014>

Salinas-Navarro, D. E., Vilalta-Perdomo, E., Michel-Villarreal, R., & Montesinos, L. (2024). Using generative artificial intelligence tools to explain and enhance experiential learning for authentic assessment. *Education Sciences*, 14(1), 83. <https://doi.org/10.3390/educsci14010083>

Schulze, S., & Lemmer, E. (2017). Supporting the development of postgraduate academic writing skills in South African universities. *Per Linguam: A Journal of Language Learning/Per Linguam: Tydskrif vir Taalaanleer*, 33(1), 54–66. <http://dx.doi.org/10.5785/33-1-702>

Schraudner, M. (2014). The online teacher's assistant: Using automated correction programs to supplement learning and lesson planning. *CELE Journal*, 22, 128–140. <https://www.semanticscholar.org/paper/The-Online-Teacher%27s-Assistant-%3A-Using-Automated-to-Michael/fe21cca6250d6776fb60a4cfbd771918a463116a>

Shuford, J. (2024). Examining ethical aspects of AI: Addressing bias and equity in the discipline. *Journal of Artificial Intelligence General Science (JAIGS)*, 3(1), 262–280. <https://doi.org/10.60087/jaigs.v3i1.119>

Singh, M. K. M. (2019). Academic reading and writing challenges among international EFL master's students in a Malaysian university: The voice of lecturers. *Journal of International Students*, 9(4), 2166–3750. <http://dx.doi.org/10.32674/jis.v9i3.934>

Strzelecki, A. (2023). To use or not to use ChatGPT in higher education? A study of students' acceptance and use of technology. *Interactive Learning Environments*, 34(2), 1–14. <https://doi.org/10.1080/10494820.2023.2209881>

Thangthong, P., Phiromsombut, J., & Imsa-ard, P. (2024). Navigating AI writing assistance tools: Unveiling the insights of Thai EFL learners. *THAITESOL Journal*, 37(1), 111–131. <https://so05.tci-thaijo.org/index.php/thaitesoljournal/article/view/270168>

University of South Africa. (2024). *Procedures for master's and doctoral degrees*. <https://tinyurl.com/bdht7ky6>

Uzun, L. (2023). ChatGPT and academic integrity concerns: Detecting artificial intelligence generated content. *Language Education and Technology*, 3(1). https://www.researchgate.net/publication/370299956_ChatGPT_and_Academic_Integrity_Concerns_Detecting_Artificial_Intelligence_Generated_Content

Velander, J., Otero, N., & Milrad, M. (2024). What is critical (about) AI literacy? Exploring conceptualizations present in AI literacy discourse. In A. Buch, Y. Lindberg, & P. T. Cerratto, (Eds.), *Framing futures in postdigital education: Critical concepts for data-driven practices* (pp. 139–160). Springer Nature.

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>

Weber-Wulff, D., Anohina-Naumeca, A., Bjelobaba, S., Foltýnek, T., Guerrero-Dib, J., Popoola, O., Šigut, P., & Waddington, L. (2023). Testing of detection tools for AI-generated text. *International Journal for Educational Integrity*, 19(1), 26. <http://dx.doi.org/10.1007/s40979-023-00146-z>

Yuvayapan, F., & Bilginer, H. (2020). Identifying the needs of postgraduate students: The first step of academic writing courses. *Journal of Language and Linguistic Studies*, 16(2), 595–611. <https://doi.org/10.17263/jlls.759260>