Writing Support with Grammarly: Examining Confidence, Help-Seeking Behavior, and User Perceptions in Higher Education

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ABSTRACT
This study examines Grammarly's utility as a writing assistant for enhancing higher education students' writing skills. University writing centers and classroom settings now incorporate Grammarly as a resource for writing assistance and there is a need to understand how students view its use and its link to help-seeking behavior. 476 university students completed the study's questionnaire with the goal of assessing how students' help-seeking behaviors, writing confidence, and perceptions of Grammarly's effectiveness correlate with their use of the tool and its impact on writing quality. Initially, mean score comparison identified the levels students used Grammarly and Spearman correlations found a significant positive correlation between Grammarly use and improvements in writing quality and confidence. Analysis of variance (ANOVA) revealed statistically significant differences in writing confidence and help-seeking behaviors across academic years and between free and paid Grammarly users, indicating the tool's version and academic level's distinct effects on writing development. Participants who use the paid version reported more substantial benefits, highlighting the added value of premium features. Qualitative feedback from students underscores Grammarly's role in identifying grammatical errors, enhancing sentence structure, and bolstering writing confidence. However, critiques emerged concerning the occasional impractical suggestions and the perceived limitations of the free version. The findings suggest practical implications for integrating digital tools in educational settings and recommend directions for future research on technology's role in academic writing support.
Keywords: Grammarly, automated writing evaluation, writing confidence, higher education, help-seeking behavior.

1.0 INTRODUCTION
The learning environment extends beyond the physical classroom to include digital spaces. In higher education, Grammarly is an important resource in the digital space, alongside classrooms and writing centers, that enhances writing skills and confidence. While difficult to master, academic writing is a critical skill in university and heavily evaluated (Carter & Harper, 2013; Magaba, 2023; Maulidina & Wibowo, 2022). There is a misconception that students can write proficiently if admitted into university; additionally, academic writing, in particular, is a challenge for university students who may not be equipped with the knowledge and skills to write on a deeper level (Magaba, 2023).

Grammarly supports students in digital learning environments by simplifying academic writing. Differences between non-academic and academic writing include tone, complexity, accuracy, and the need for more advanced vocabulary and grammar (Rafikova, 2022). The challenges associated with mastering these characteristics of academic writing underscore the importance of finding methods to improve writing outcomes. Grammarly is one such tool that assists students in overcoming writing challenges in higher education.

Corrective feedback tools, such as Grammarly, are gaining popularity in education due to their ability to provide consistent feedback (Wang et al., 2012), enabling more focused attention on content and organization of writing rather than grammatical mistakes (Ranalli, 2018). Despite these advantages, concerns exist about students not using Grammarly effectively, with some students over-relying on suggestions (Chapelle et al., 2008). To this end, Stevenson and Phakiti (2019) found that there is an emphasis on the final written product rather than the process of writing itself, leading to concerns about the lack of critical thinking when using Grammarly.

The platform Grammarly has been available since 2009 and has over 30 million users (Grammarly, 2023). Grammarly has different levels available including a free version, a premium version (paid version), a business version, and an education version called Grammarly for Education, which can be purchased for departments, academic units, or for an entire educational institution. The free version of Grammarly includes feedback on spelling, grammar, and punctuation, while Grammarly Premium provides more extensive suggestions that focus on style, tone, word choice, formality, fluency, clarity, and plagiarism detection (Javier, 2022). When used effectively, Grammarly can complement traditional writing support resources such as writing centers, peer feedback, and instructor consultations, helping to reduce the strain on writing assistance services.

Writing centers in Higher Education often welcome the use of Grammarly to support writing quality, especially for non-native English writers (Zhang et al., 2020). Zhang et al. (2020) compared Grammarly with face-to-face writing instructors and found that Grammarly was well received by students and provided an added layer of student support. Grammarly provides more feedback than human consultants (Dembsey, 2017). Further, Grammarly can address local level error issues while writing consultants and instructors can focus on global level errors (Bailey & Lee, 2020). Students appreciate the capabilities of Grammarly yet criticize its inaccurate or decontextualized feedback, with recommendations that it be used based on specific needs (Zheng et al., 2020). These positive and negative attributes associated with Grammarly are evidence that further investigation in its use and perception among higher education students is quite warranted.

1.1 AIM STATEMENT

This research aims to investigate university students' perceptions of Grammarly and its role in facilitating help-seeking behavior with writing in higher education settings, such as digital spaces, classrooms, and writing centers. It further seeks to identify if there is a relationship between Grammarly use and students' confidence in university-level writing, as well as to examine differences between grade level and users of Grammarly's free and paid versions. Findings emanating from this study will enhance understanding of the effects of Grammarly on students' writing abilities and confidence in academic writing. The study is significant as it addresses explicitly the writing challenges faced by university students and their perceptions of Grammarly. Through qualitative and quantitative analysis, the study provides a comprehensive view of the interaction between students, their writing challenges, and Grammarly, offering valuable insights for educators, students, and researchers. Furthermore, there is limited research on the relationship between Grammarly usage and students' writing confidence. The following questions address these limitations and guide the research:

1. What are the levels of Grammarly use, writing confidence, and help-seeking behavior among higher education students?
2. How does the use of Grammarly relate to help-seeking behaviors and self-confidence in writing at the university level?
3. How does Grammarly use differ among higher education students when comparing different versions of Grammarly (paid or free) and across different academic years?
4. What are students' perceptions of Grammarly as a tool for enhancing writing skills, as revealed through thematic analysis of open-ended survey responses?

2.0 LITERATURE REVIEW
2.1 THEORETICAL FRAMEWORK

The theoretical framework for this study is based on self-regulated learning theory as conceptualized by Zimmerman (1990; 2000) and Pintrich (2004). This theory consists of three phases including forethought, performance, and self-reflection. This framework is exhibited by the metacognitive and strategic actions learners display when working toward their learning objectives (Butler et al., 1995; Zimmerman, 1990). Central to this

theory is the idea that self-regulation is a critical component of the writing process, influencing both the approach to writing tasks and the overall learning performance (Roderick, 2019; Teng & Huang, 2019).

Building on the foundational principles of self-regulated learning, this study examines the relationship of Grammarly with supporting help-seeking behavior among higher education students. The use of Grammarly and similar online resources has been documented as a facilitator for self-regulated writing, particularly in the second language (L2) (Umamah & Cahyono, 2022). These corrective feedback tools aid in grammar and vocabulary enhancement and serve as external resources that can be strategically employed during the writing process to achieve learning goals. Li and Kim (2024) have demonstrated that Grammarly is highly regarded among learners for its utility in improving writing proficiency. Their research advocates for the early introduction of corrective feedback tools by educators, suggesting that such practices can support learner agency and enhance self-regulation. Encouraging students to critically examine these technologies allows educators to guide them toward a more intricate insight into their writing processes, promoting more successful learning techniques.

The following review will contextualize how Grammarly, as technological support, contributes to a university level learning environment conducive to advancing writing skills (Ismawati et al., 2021; O'Neill & Russell, 2019), increasing confidence (Likkel, 2012; Mascle, 2013), and encouraging active seeking of writing assistance among students in higher education.

2.2 GRAMMARLY USE IN HIGHER EDUCATION

There is a growing interest in the role of artificial intelligence and corrective feedback tools such as Grammarly in assisting students in their writing development. Research has provided evidence of the effectiveness of Grammarly in improving writing skills (Ismawati et al., 2021; O'Neill & Russell, 2019; Zhang et al., 2020). It is important to note that Grammarly does not write for students or assist with writing content, rather it aids learners in identifying possible mistakes or areas of improvement (Zinkevich & Ledeneva, 2021). The growing focus on AI-supported tools like Grammarly signifies a shift towards technology integration to enhance students' writing skills.

Grammarly is used across various educational settings, with high use among English language learners (Ananda et al., 2021; Bailey & Lee, 2020; Fahmi & Cahyono, 2021; Fitria, 2021; Hakiki, 2021; Karyuatry et al., 2018; Zhang et al., 2020). Studies on Grammarly in the English language context generally report favorable results in terms of writing improvement (Huang et al., 2020) and writing confidence (Setyani et al., 2023). Grammarly can aid in detecting a range of mistakes in grammar, punctuation, sentence structure, style, and vocabulary (Ventayen & Orlanda-Ventayen, 2018). Grammarly can also be used to explore different errors in students' writing (Vidhiasi & Haryani, 2020) such as error frequencies, error types, and sentence complexity in students' writing (Bailey & Lee, 2020). Studies also report that Grammarly can help identify surface-level writing problems, such as grammar and mechanics issues, while teachers can assist with deeper elements of writing, including cohesion and content (Bailey & Lee, 2020; Thi & Nikolov, 2021).

Regardless of the benefits that Grammarly offers, the drawbacks should be considered. There are concerns about students quickly accepting writing suggestions without fully understanding if the changes will enhance their writing. Koltovskaia (2020) examined two English as a second language (ESL) college students' behavioral, cognitive, and affective engagement with Grammarly. The results indicated that one student had a stronger cognitive engagement with Grammarly but did not fully check the accuracy of the feedback, while the other student tended to rely heavily on the feedback without checking the accuracy. Koltovskaia's (2020) study, although insightful, was limited to just two students. The free version of Grammarly also has limited writing improvement features, which can inhibit overall writing improvement (Fitriana & Nurazni, 2021). Grammarly's free version can aid with minor errors, but for more extensive writing aid, the premium version provides more suggestions (Cavaleri & Dianati, 2016; Fitria & Miftah, 2022). Zinkevich and Ledeneva (2021) studied 100 English language learners' essays using Grammarly. They found that the premium version of Grammarly provides the flexibility to select various writing styles, address different audiences, choose the tone of writing, and navigate through many other subtle difficulties with writing that may be problematic for non-native English speakers (Zinkevich & Ledeneva, 2021). Additionally, Grammarly may provide misleading, or possibly inaccurate, suggestions that writers should be cognizant of (Barrot, 2022; Fitriana & Nurazni, 2021). To address potential issues with student reliance on Grammarly, providing training sessions on its effective use is recommended (Rao et al., 2019).While Grammarly proves valuable for writing improvement, educators and students alike should be mindful of its limitations and actively engage in training sessions to maximize its benefits.

The benefits of Grammarly extend beyond English language learners. For instance, a study conducted by Cavaleri and Dianati (2016) demonstrated that Grammarly not only provided valuable explanations to students but also contributed to a better understanding of grammar rules and increased writing confidence. It is important to

acknowledge that this study had a relatively small sample size of 18 students, eight of whom were non-native English speakers enrolled in various academic programs. O'Neill and Russell (2019) studied academic advisors' perceptions of Grammarly at a multi-campus and reported generally favorable findings. Six advisors were surveyed about their views of Grammarly feedback to international students ($n = 47$) and domestic students ($n = 29$). Findings indicate that Grammarly feedback is useful and provides feedback faster than traditional instructor feedback. However, some drawbacks were also noted since Grammarly missed some mistakes and gave incorrect suggestions. As technology continues to advance, ongoing research becomes critical to examine the full potential of corrective feedback tools like Grammarly, even in native English-speaking contexts. These studies highlight the multifaceted impact of Grammarly, showcasing its ability to provide valuable insights, enhance understanding of grammar rules, and contribute to increased writing confidence across diverse educational settings. However, they also highlight the importance of acknowledging limitations and continuously refining these tools for increased support in the writing process.

2.3 WRITING CONFIDENCE AND GRAMMARLY USE

Good writing skills are critical in higher education, and universities must ensure that students are equipped with the skills needed for the job market (Calma et al., 2022). Despite this emphasis, some students struggle with a lack of confidence in their writing. Studies indicate that enhancements in confidence and self-efficacy related to writing proficiency can result in advancements in writing capabilities (Likkel, 2012; Mascle, 2013). Myriad factors impact students' writing confidence (Ruegg & Koyama, 2010). Some instructors believe that the quality of feedback will lead to improved student writing, which may not necessarily be the case (Ruegg & Koyama, 2010). Additionally, students may lose confidence in their writing based on the amount and type of feedback they receive (Hyland, 1998). Although universities aim to provide students with job market-relevant writing skills, a significant challenge remains regarding some students' lack of confidence in writing. Previous studies, such as Soegiyarto et al. (2022) for non-native English speakers and O'Neill and Russell (2019) within the Australian context, have indicated increased confidence through Grammarly use.

Writing confidence has been extensively explored in relation to Grammarly use (Faisal & Carabella, 2023; Purwanti & Kastuhandani, 2023; Setyani et al., 2023; Vo & Nguyen, 2021). The introduction of new pedagogical strategies for teaching essays, as discussed by Highland & Fedtke (2023), alongside the integration of Grammarly, provides new strategies in writing instruction. In a study in the Indonesian context, Setyani et al. (2023) found that writing confidence improved after Grammarly use especially in terms of grammar development. Specifically, students reported more flexibility in "behavior, cognitive efforts, emotional stability, motivation, and self-esteem in writing" (Setyani et al., 2023, p. 65); however, this study was limited to just three students. A further study conducted in Indonesia by Pratama (2020) found that Grammarly improved undergraduate students' writing confidence by providing real-time suggestions while students were writing. Vo and Nguyen (2021) investigated the application of Grammarly among English major students at a Vietnamese university. A significant discovery for the participants ($n = 17$) in the control group employing Grammarly was the enhancement of their writing confidence, which is attributed to real time and consistent feedback. Another study in the Indonesian university context found that 60% of students ($n = 40$) agreed that Grammarly helped to improve their confidence in writing (Armanda et al., 2022). Similar outcomes were documented by Maulidina and Wibowo (2022) in their examination of Grammarly usage at an Indonesian university. They reported that 61% of students ($n = 33$) perceived improvement in their grammar skills using Grammarly (Maulidina & Wibowo, 2022). While these studies collectively underscore the positive impact of Grammarly on enhancing writing confidence, there is a recognized need for more comprehensive research in this area, especially in native English-speaking settings.

2.4 HELP-SEEKING BEHAVIOR AND GRAMMARLY USE

In higher education, help-seeking behavior occurs within classrooms, writing centers, and digital space environments. Help-seeking behavior can be categorized as either informal, involving assistance from friends and family, or formal, involving assistance from instructors and academic resources (Knapp & Karabenick, 1988). For informal, students seek help from their immediate social network for comfort, ease of access, and the lower perceived risk involved in these interactions (Beisler & Medaille, 2016; Pillai, 2010). In contrast, formal help-seeking involves going to professors, writing tutors, and utilizing academic resources. Corrective feedback tools such as Grammarly facilitate self-regulation in the educational process, serving as a low-stakes, self-guided source of assistance for students improving their writing skills. Grammarly introduces a precise method of assistance in both academic and non-academic writing, significantly enhancing the quality of student output. This approach to seeking help with Grammarly can positively influence students' writing confidence and academic performance. The relationships among help-seeking behavior, writing confidence, and the use of technologies like Grammarly is complex and warrants further investigation. Students with high self-efficacy are generally more inclined to seek help, whereas those with lower confidence, especially in their writing skills, may hesitate to seek formal help due to fear of embarrassment or judgment (Williams & Takaku, 2011; Aunkst, 2019). Grammarly acts as a supportive,

non-judgmental resource that encourages proactive help-seeking behaviors. Additionally, research emphasizes the value of empathy and personalized support in formal academic settings, such as writing centers, for improving students' confidence and willingness to seek help (Lundin et al., 2023). Consequently, integrating Grammarly with traditional help-seeking methods can create a more supportive and effective learning environment.

3.0 METHODOLOGY

This convergent mixed method study was conducted in November of 2023 after receiving institutional review board permission. Participants ($n = 476$) included undergraduate and graduate level students studying at a mid-sized public university in the southeastern United States. Participants were selected based on convenience and purposive sampling. A survey link was posted on the university learning management for 2 weeks. The survey comprised closed and open-ended questions on students' Grammarly and writing experiences and perceptions. Majors included Nursing ($n = 55$), Psychology ($n = 39$), Education ($n = 38$), Biology ($n = 24$), Computer Information & Science ($n = 22$), Criminal Justice ($n = 19$), Business ($n = 18$), Liberal Arts ($n = 16$), Marketing ($n = 14$), Radiology ($n = 13$), and Others ($n = 218$). The characteristics of the sample can be found in Table 1.

Table 1: *Classification of Students by Level and Major*

Level	Frequency	Percentage
First-year (freshman)	151	31.7
Second-year (sophomore)	70	14.7
Third-year (junior)	87	18.3
Fourth-year (senior)	96	20.2
Graduate Level	62	13.0
Missing	10	2.1
Total	476	100

3.1 QUESTIONNAIRE CONSTRUCTION

The questionnaire was designed using insights from four academic writing instructors, each with over 10 years of experience, aiming to support the university's quality enhancement plan focused on writing improvement. This plan includes considering the institution-wide adoption of Grammarly for Education to support writing outcomes. Moreover, university faculty and staff with expertise in writing and statistics were consulted to refine the survey questions.

The construction of the in-house questionnaire was influenced by key studies in three areas of interest: Grammarly use, writing confidence, and help-seeking behavior. For open-ended items enquiring about Grammarly use, insights were drawn from O'Neill and Russell (2019), Faisal and Carabella (2023), Fitria and Sabarun (2022), Fitriana and Nurazni (2022), and Hakiki (2021), highlighting students' perceptions and effectiveness of Grammarly in academic writing. Help-seeking behavior was informed by studies such as Knapp and Karabenick (1988), Umamah and Cahyono (2022), and Williams and Takaku (2011), focusing on academic help-seeking in the context of writing. Items measuring confidence in students' writing were influenced by Ruegg and Koyama (2010), examining the role of feedback in enhancing writing confidence.

The Grammarly Use scale consisted of four items, assessing various aspects of students' experiences with Grammarly. Items one through three explored students' familiarity, frequency of use, and perceived helpfulness with Grammarly (Cronbach's alpha = .808), utilizing a five-point Likert scale ranging from *Extremely likely* (5) to *Not likely at all* (1). Item four enquired about the likelihood of students using the paid version if the university provided it. A further item was added to identify the version (paid or free) that students used.

The Writing Confidence scale (Cronbach's alpha = .809) consisted of three items aimed at measuring students' confidence levels in non-academic writing, academic writing, and research writing. These items employed a 5-point Likert scale, ranging from *Not Confident at All* (1) to *Extremely Confident* (5). This range of items was selected to capture a comprehensive view of students' writing confidence across different contexts, recognizing that skills and self-assurance may vary significantly between informal, coursework-related, and research-oriented writing tasks.

The Help-Seeking scale includes two sub-components: formal help-seeking (Cronbach's alpha = .679), and informal help-seeking (three items, Cronbach's alpha = .646) behaviors, measured on a five-point scale from "Extremely Unlikely" (1) to "Extremely Likely" (5). This division into formal and informal categories follows Knapp and Karabenick's (1988) framework for understanding help-seeking in higher education. The Help-Seeking

scale, with Cronbach's alpha scores of .679 (formal) and .646 (informal), suggests modest internal consistency. These results are contextualized by the scale's high construct validity, achieved through detailed consultations with researchers and professionals in academic writing, ensuring the items accurately reflect the help-seeking behaviors conceptualized by Knapp and Karabenick's (1988).

The questionnaire includes an open-ended question for users of Grammarly to detail their perceptions of the tool's functionality, effectiveness, and ease of use: "If you use Grammarly (any version), what are your thoughts on the tool?" This item seeks to gather in-depth user feedback on how they use Grammarly to help with their writing. Lastly, demographic information collected in the questionnaire included academic year and major (*see* Table 1). Wording for the survey items are presented in Table 2.

3.1.1 QUESTIONNAIRE ADMINISTRATION
The study utilized a questionnaire for higher education students with academic and research-related writing responsibilities. The questionnaire was formatted for online distribution via Google Forms. Students, under instructor supervision, completed the online questionnaire. They were informed about the study's goals and their right to opt out or exclude their data at any time.

3.2 DATA ANALYSIS
For quantitative analysis, this study used SPSS (version 28). Analysis for research question 1 entailed calculating mean scores for individual questionnaire items and the overall mean scores for the variables of interest. For research question 2, Spearman's correlation was used to measure the relationships between the frequency of Grammarly use, writing confidence, and help-seeking behavior. For research question 3, one-way ANOVA tests were used to measure differences in variables among student groups categorized by Grammarly version (paid or free) and academic year. Running an ANOVA to compare levels of Grammarly use, writing confidence, and help-seeking behavior between students with the paid versus free version of Grammarly and academic year can still be valuable even after a correlation analysis shows a significant positive relationship. Correlation provides insight into the relationship between variables, but it does not indicate the magnitude of difference in writing confidence between the groups. Moreover, conducting both analyses adds rigor to the research by validating findings across different statistical methods. For the qualitative component addressing research question 4, thematic analysis was used to identify and report commonalities in the participants' responses (Flick, 2023). The first step was familiarization with the open-ended data followed by generating initial codes. Overarching themes for the codes were developed, and finally, the themes were reviewed and refined. This was initially done manually. Following manual coding and theme generation, the Dedoose qualitative coding program was used to help refine the codes and themes.

4.0 RESULTS
Research question 1 explored overall Grammarly use, writing confidence, and help-seeking behaviors among higher education students. The investigation into Grammarly's usage revealed significant engagement with the application among students. Students are highly familiar with the Grammarly application and find it extremely helpful, as indicated by mean scores above the 3.5 level for those two items on the Grammarly Use scale. Likewise, students report using Grammarly frequently when writing papers or writing assignments. A majority of students at the university are utilizing Grammarly to aid in their writing, with most opting for the free version. Specifically, 415 students use the free service and 37 subscribe to the premium version. Three items were asked regarding students' familiarity and use of Grammarly (see Table 2). The data indicates that most students are familiar with the writing application Grammarly and use it when writing papers or assignments. Most students found Grammarly helpful in improving their writing. Out of the 476 participants, 346 students reported that they are extremely likely to use the paid version of Grammarly if the university were to obtain it.

Regarding help-seeking behavior, students predominantly favor formal means to receive help, such as professors, digital tools (e.g., ChatGPT, Grammarly), and academic support services (including writing centers). Students demonstrated a preference for formal help-seeking channels, such as professors, online applications (e.g., ChatGPT, Grammarly), and academic resources (e.g., writing centers), over informal sources like family members and colleagues for writing assistance. Online applications like Grammarly scored the highest mean score among the items within the formal help-seeking scale.

The study further explored students' writing confidence across various contexts: non-academic writing, academic writing, and research activities. In examining students' self-reported confidence levels, the study explored three key domains: non-academic writing, academic writing, and research activities. The mean scores across domains, with the greatest confidence reported in non-academic writing, followed by academic writing, and the lowest in research writing (see Table 2). The average confidence score for non-academic writing tasks was high, indicating

that students generally feel competent in everyday writing scenarios. Academic writing confidence showed a moderately high score, suggesting a positive but slightly less confident stance towards more formal writing tasks. Confidence in academic writing presented the lowest mean score among the three, pointing to a lower range of confidence levels in handling research-related tasks.

Table 2: *Items on Grammarly Usage, Writing Confidence, and Help-Seeking Behaviors Among University Students*

	Grammarly Use	M	SD	Skew	Kurt
1	How familiar are you with the writing application Grammarly?	3.95	1.08	-0.85	0.04
2	How often do you use Grammarly when writing papers or writing assignments for your classes?	3.49	1.20	-0.41	-0.60
3	If you have used Grammarly, how helpful have you found it in improving your writing?	3.77	1.06	-0.53	-0.56
	Total	4.14	0.73	-0.99	1.36
	Writing Confidence				
4	How confident are you in your ability to write for non-academic purposes (e.g., emails, job applications, letters, etc.)?	3.93	0.90	-0.80	0.55
5	How confident are you in your ability to write in university-level courses (e.g., essays, research papers, class reflections, case studies, reports, etc.)?	3.58	0.95	-0.63	0.06
6	How confident are you in your ability to engage in university-level research (e.g., develop relevant research questions, use appropriate library resources, collect data, paraphrase, and incorporate academic citations, etc.)?	3.21	1.08	-0.29	-0.56
	Total	3.57	0.83	-0.50	-0.05
	Formal Help-Seeking Behavior				
	When having difficulty with a writing assignment, how likely is it that you would seek help from the following people or resources?				
7	Professor	3.76	1.18	-0.62	-0.63
8	Academic student resources (e.g., Writing Center, Learning Resource Center)	3.39	1.32	-0.34	-1.01
9	Online applications and other technologies (e.g., ChatGPT, Grammarly)	3.73	1.36	0.33	6.02
	Total	3.58	1.09	-0.46	-0.68
	Informal Help-Seeking Behavior				
	When having difficulty with a writing assignment, how likely is it that you would seek help from the following people or resources?				
10	An intimate partner (e.g., spouse, girlfriend, or boyfriend).	3.04	1.46	-0.13	-1.36
11	A friend	3.31	1.28	-0.35	-0.87
12	A parent or another relative/family member	2.90	1.46	0.05	-1.37
	Total	3.10	1.10	-0.20	-0.77
	Grammarly Version				
13	If you use Grammarly, which version of Grammarly do you use?	1.12	0.32	2.41	3.84
14	If the university were to obtain the paid version of Grammarly that students could use for free, how likely would you be to use it?	4.73	0.66	-3.05	10.67

Research Question 2 measured the correlation between the use of Grammarly and its impacts on help-seeking behaviors and self-confidence in writing among university students. Spearman correlations were utilized to investigate these relationships, focusing on three main variables. Additionally, the analysis considered background factors, such as whether students were using the free or paid version of Grammarly and their academic year, as detailed in Table 3. This analysis highlighted relationships among the variables, with the type of Grammarly version showing the most significant associations. Except for writing confidence and formal help-seeking behavior, all relationships with Grammarly versions were statistically significant. These findings suggest that students using the paid version of Grammarly tend to be in higher academic years (i.e., freshman to graduate grade levels), use Grammarly more frequently, and are more inclined to seek help from professors and academic writing resources. Interestingly, students at higher academic levels (senior and graduate students) tended to use Grammarly more frequently and were less inclined to seek help from friends and family. A statistically significant correlation was observed between students who exhibited greater writing confidence and those who engaged in formal help-seeking behaviors, as well as with their use of Grammarly. Additionally, students confident in their writing abilities

were more likely to seek academic support, and those who sought help from friends and family were also found to engage in formal help-seeking behaviors at school.

Table 3: *Spearman Correlation and Mean Scores of Study's Variables*

		1	2	3	4	5	6
1	Version (paid/free)						
2	Academic Year	.152**					
3	Grammar Use	.245**	-.001				
4	Confidence	-.015	.263**	.100*			
5	Informal Help-Seeking	-.125**	-.178**	.001	-.012		
6	Formal Help-Seeking	-.004	-.076	.103*	.155**	.167**	
	M	1.12	2.67	4.14	3.57	3.10	3.58
	SD	0.32	1.44	0.73	0.83	1.10	1.09

Note. $^{**}p < .01$, $^{*}p < .05$

Research Question 3 explored the variation in Grammarly use among higher education students by examining the differences between users of its paid and free versions and across different academic years, including freshman, sophomore, junior, senior, and graduate students. This analysis seeks to understand how Grammarly use, writing confidence, and help-seeking behavior change based on the version of Grammarly used and the students' academic progression.

As seen in Table 4, an ANOVA was conducted to examine differences in Grammarly use, writing confidence, and help-seeking behaviors (informal and formal) between students using the paid and free versions of Grammarly. Significant differences were observed in Grammarly use ($F=30.280$, $p<.001$) and informal help-seeking behavior ($F=8.89$, $p=.006$), indicating that students with the paid version reported higher usage of Grammarly and were more inclined to seek help informally from friends and family. No significant differences were found in writing confidence ($F=.104$, $p=.747$) and formal help-seeking behavior ($F=.008$, $p=.927$). Given the binary nature of the comparison (paid versus free versions), Bonferroni post hoc analysis was not necessary.

Table 4: *ANOVA for Grammarly Use, Writing Confidence, and Help-Seeking Behavior across Paid and Free Versions of Grammarly*

Variable	Source	Sum of Squares	df	Mean Square	F	p
Grammarly Use	Between Groups	15.131	1	15.131	30.28	.000**
	Within Groups	236.357	452	0.5		
Writing Confidence	Between Groups	0.072	1	0.072	0.104	.747
	Within Groups	328.798	452	0.694		
Informal Help-Seeking	Between Groups	8.896	1	8.896	7.516	.006**
	Within Groups	561.064	452	1.184		
Formal Help-Seeking	Between Groups	0.01	1	0.01	0.008	.927
	Within Groups	553.722	452	1.193		

Note. $^{**}p < .01$

An additional ANOVA was conducted to assess variations across academic years, as displayed in Table 5. The analysis revealed statistically significant differences in writing confidence ($F=9.525$, $p<.001$) and informal help-seeking behavior ($F=5.272$, $p=.001$). Bonferroni post hoc tests were applied to identify the specific academic years where these differences occurred. Results indicated that seniors and graduate students exhibited higher Writing

Confidence levels compared to their freshman and sophomore peers. Conversely, in terms of Informal Help-Seeking Behavior, graduate students demonstrated lower average scores compared to freshmen, sophomores, and juniors. This suggests that lower-level students are more inclined to obtain assistance from family and friends.

Table 5: *ANOVA for Grammarly Use, Writing Confidence, and Help-Seeking Behavior across Academic Year*

Variable	Source	Sum of Squares	df	Mean Square	F	p
Grammarly Use	Between Groups	0.832	4	0.208	0.386	.818
	Within Groups	247.484	449	0.538		
Writing Confidence	Between Groups	24.102	4	6.025	9.525	.000**
	Within Groups	291.625	449	0.633		
Informal Help-Seeking	Between Groups	21.09	4	5.272	4.51	.001**
	Within Groups	538.945	449	1.169		
Formal Help-Seeking	Between Groups	3.786	4	0.946	0.789	.533
	Within Groups	541.212	449	1.2		

Note. **$p < .01$

The Bonferroni post hoc analysis presented in Table 6 reveals significant differences in writing confidence levels among student groups. Specifically, freshmen and sophomores reported lower confidence in their writing abilities compared to senior and graduate students. Additionally, the analysis indicates that freshmen and sophomores are more inclined to seek assistance with writing from informal sources, such as family and friends, rather than formal or institutional resources.

Table 6: *Bonferroni post hoc analysis for ANOVA for grade level and study's variables*

Comparison	Mean Difference	SE	p	95% CI [Lower, Upper]
Writing Confidence				
Fresh vs Sen	-0.53031	0.104	0.0**	[-0.823, -0.237]
Fresh vs Grad	-0.54397	0.12	0.0**	[-0.882, -0.206]
Soph vs Sen	-0.42044	0.125	0.01*	[-0.773, -0.068]
Soph vs Grad	-0.4341	0.139	0.02*	[-0.825, -0.043]
Jun vs Sen	-0.36231	0.118	0.02*	[-0.694, -0.03]
Jun vs Grad	-0.37597	0.132	0.05*	[-0.749, -0.003]
Informal Feedback				
Fresh vs Sen	0.48383	0.156	0.02*	[0.044, 0.923]
Fresh vs Grad	0.84065	0.179	0.0**	[0.335, 1.346]
Soph vs Grad	0.72549	0.207	0.01**	[0.141, 1.31]
Jun vs Grad	0.62864	0.199	0.02*	[0.068, 1.189]

Note. **$p < .01$, *$p < .05$

Research Question 4 used thematic analysis to examine students' perceptions of Grammarly as a tool for improving writing skills, based on open-ended survey responses. This approach aims to uncover the underlying themes in students' feedback and experiences with Grammarly in their academic writing.

4.1 GRAMMARLY PERCEPTIONS

Participants who are currently using Grammarly were asked to share their perceptions of the tool. They were also asked if they had any additional feedback or thoughts regarding Grammarly. Overall, participants who are using Grammarly reported positive experiences. The proceeding section discusses dominant themes that emerged including writing improvement, convenience and usage, and helpful features. While perceptions of Grammarly were predominantly positive, some challenges were also discussed. These findings are presented thematically as drawbacks.

4.2 WRITING IMPROVEMENT

Participants noted that Grammarly has helped them improve their writing. They indicated that Grammarly aids specifically in catching spelling errors, improving grammar, refining sentence structure, and improving confidence. One participant noted, "I think it is an effective way to improve your writing while also teaching you how to word your sentences better." Participants also mentioned that Grammarly aids with minor details that writers may miss. Although open-ended questions did not specifically ask the students about Grammarly and confidence, a participant reported, "It does help or at least make me feel more confident in the writings I submit." Another stated, "I would suggest many more people use [it] for important projects they have. I think it's a nice way to check your work before submitting and it builds confidence." Participants reported Grammarly's positive impact on their writing, citing improvements in spelling, grammar, sentence structure, and heightened confidence in their submissions.

4.3 CONVENIENCE AND USAGE

Participants find Grammarly convenient, especially for proofreading. They also find Grammarly easy to use, and the interface is friendly for beginners. A participant stated, "I think it's very user friendly and it helps so much when writing papers. It's changed my life for the better these past years." Additionally, participants noted that it simply underlines potential mistakes, making it easy to make modifications. Another participant stated, "I've been using Grammarly for as long as I can remember, and I couldn't imagine a world without it." Participants also reported that the pop-up suggestions are convenient. For example, one participant stated, "I find it highly functional and convenient to use the app on my computer since I prefer working on Word rather than their built-in document creator." Another discussed the practicality of Grammarly in aiding with writing without Grammarly action writing for the students. "I think that every student should use Grammarly. It's always nice to have something checking your work without completely changing it." Participants reported valuing Grammarly for its user-friendly interface, convenient proofreading, and overall impact on their writing.

4.4 HELPFUL FEATURES

Participants highlighted the helpful features of Grammarly including correcting mistakes, improving sentence structure, and providing helpful vocabulary. One participant provided a detailed overview of their experiences using Grammarly and highlighted the beneficial features. The participant stated,

> I use the free version and it honestly is very good. It definitely has updated this past year and now has an AI tool built in. It provides me what I can mention in my writing with already knowing my topic. Grammarly also provides simple spell checks which really comes in handy, so you don't have to reread to find your mistakes.

A similar example provided is "I think it is very helpful for correcting grammar errors or repeated words, helps align sentences more grammatically and is generally a good thing to have." Participants value Grammarly for its beneficial features, such as effective spell checks, grammar corrections, and improved sentence structure.

4.5 DRAWBACKS

Although feedback was generally positive, participants mentioned specific areas for improvement were odd or incorrect suggestions that need to be improved in the system. Additionally, another dominant concern was the limited features of the free version of Grammarly. For example, one participant stated, "It is very good at its main function, but sometimes it tries to fix things in a robotic way." Another said, "Sometimes the commas are not needed. Just have to use my own discretion when choosing to accept the suggestion or not." Another participant commented on the differences between the paid and free versions. "I had the paid version last year, and I actually found it helpful and way better compared to the free version I have now. The free one is glitchy in the way that it recommends ridiculous words that do not sometimes make sense." Participants also mentioned occasional glitches in the free version and noted that specific suggestions can only be accessed through a paid version of Grammarly. One participant had positive remarks about Grammarly but also indicated that the "free version is a bit annoying because some things can only be fixed with the paid version." This was reiterated by another participant who said, "I love Grammarly. I just wish the free version had more options." Furthermore, participants stated that cost is a

concern since the premium version is expensive, and some expressed a desire for the university to give access to students.

5.0 DISCUSSION

The current study provides significant insights into how students use Grammarly as a tool to improve their writing in the academic context, in digital and physical spaces. Results indicate that Grammarly has aided students in both academic, professional, as well as in personal experiences of writing, which aligns with other studies on the benefits of Grammarly for improving writing (Ventayen & Orlanda-Ventayen, 2018; Vidhiasi & Harvani, 2020). Despite Grammarly being perceived to be a useful tool for writing improvement pertaining to grammar and spelling, both existing literature (Koltovskaia, 2020) and the current study indicate that users must engage in critical thinking and contextual judgment, in accepting the grammatical and syntactical changes Grammarly offers.

Regarding the first research question, this investigation into Grammarly's effect on writing confidence and help-seeking behaviors in higher education students uncovered insights into their usage and attitudes. Firstly, a significant engagement with Grammarly is evident among students, demonstrating its value in the academic writing process, echoing extant literature (Ananda et al., 2021; Ismawati et al., 2021; O'Neill & Russell, 2019; Zhang et al., 2020). Students reported frequently using Grammarly for writing assignments and expressed a high level of satisfaction with its capabilities, particularly appreciating its free version, though many show interest in upgrading if provided by their institutions (Faisal & Carabella, 2023).

Moreover, findings highlight a clear preference for formal help-seeking channels, including professors, digital tools like Grammarly, and academic support services over informal sources such as family and colleagues (Beisler & Medaille, 2016 Knapp & Karabenick, 1988). This trend suggests students' strategic approach to overcoming writing challenges, favoring structured academic support mechanisms. Interestingly, digital tools, particularly Grammarly, rank high among students' preferred resources, indicating a reliance on technology for writing assistance. This reliance is indicative of a deeper integration of technology within both physical spaces like classrooms and digital environments, underscoring its evolving role in education. As educational institutions continue to navigate between physical and digital spaces, the value and impact of these tools on learning and writing proficiency become increasingly significant.

Regarding writing confidence, the study revealed the highest confidence in non-academic writing, followed by academic writing, and the lowest in research writing, in line with findings from Fahmi and Cahyono (2021) and Fitria (2021). This gradation suggests that students feel relatively assured in everyday writing scenarios but can use assistance with tools like Grammarly when faced with more formal, academic-oriented writing and research tasks. This underlines the need for continued support and resources in higher education environments including, writing centers, to mitigate confidence gaps in academic and research writing.

Research Question 2 explored the relationship between Grammarly use, help-seeking behaviors, and writing confidence, revealing several key findings. The use of Grammarly, especially the paid version, is closely linked to more frequent use and a higher likelihood of seeking formal academic help, as noted in studies by Faisal and Carabella (2023) and Ananda et al. (2021). Higher academic year students tend to use Grammarly more, suggesting a reliance on this tool for advanced writing tasks.

The data also shows a clear connection between students' writing confidence and their propensity to seek formal academic support. Confident students are more proactive in seeking help from academic resources and professors (Cavaleri & Dianati, 2016; Huang et al., 2020). This supports the idea that confidence in writing motivates students to enhance their skills through available support services (Butler & Winne, 1995). Additionally, students who seek informal help from friends and family also tend to use formal academic resources, indicating a multi-faceted approach to overcoming writing challenges (Beisler & Medaille, 2016). This dual strategy of help-seeking behavior highlights the significant role of digital tools and self-regulation in academic success, aligning with broader educational trends (Zimmerman, 2000; Li & Kim, 2024). These findings emphasize the importance of integrating effective support mechanisms within the higher education learning environment to cater to student confidence and success in writing.

Research Question 3's findings on the varied use of Grammarly among higher education students highlight aspects of writing confidence and help-seeking behavior. The analysis indicates significant differences in writing confidence, with senior and graduate students displaying higher levels than their younger counterparts, freshmen and sophomores. This aligns with studies like those by Cavaleri and Dianati (2016) and Huang, Li, and Taylor (2020), which suggest that advanced students develop greater confidence in their writing abilities through continued exposure to academic writing tasks and feedback tools like Grammarly.

Additionally, the observed variation in informal help-seeking behavior, particularly the lower tendency among graduate students compared to undergraduates, underscores the shift in reliance on personal networks versus formal academic resources as students progress in their academic careers. This could reflect a transition towards more independent learning strategies and the utilization of professional tools for writing assistance, as discussed in the works of Aunkst (2019) and Barrot (2022). The increased independence and confidence among senior and graduate students may also indicate a higher level of self-regulation in their learning processes, a key component of academic success highlighted by Zimmerman (2000) and Butler and Winne (1995). These patterns of engagement with writing tools and academic support reflect a broader trend in learning environments adapting to promote increased self-efficacy and autonomy among students in higher education.

Research Question 4 explored the comparative effectiveness of Grammarly's free and paid versions, as perceived by students, in enhancing their writing skills. Regarding the usefulness of the tool, the free version of Grammarly is perceived to be less useful than the paid version. The paid version offers higher usability while the free version was very useful for the basic grammatical and syntactical changes. Grammarly Premium can provide more detailed feedback for different writing styles and audiences; furthermore, it can aid with the tone of writing. The free version often glitched and posited technological challenges, which frustrated the student users, especially when they worked on tight deadlines. The free version, by definition, is limited with features, which hinders the student. Additionally, the paywall of the paid version can isolate students who lack the financial resources to afford it, ultimately limiting their access to enhanced writing assistance.

Student users of Grammarly find significant value in using the tool and feel more confident in the quality of their writing when they use Grammarly to edit their papers for schoolwork. The findings of this study are aligned with similar studies that explored the increase in writing confidence that was attributed to Grammarly use (Faisal & Carabella, 2023; Purwanti & Kastuhandani, 2023; Setyani et al., 2023; Vo & Nguyen, 2021). Due to this, university-level subscriptions may benefit students more than expecting individual students to download and use Grammarly.

5.1 PEDAGOGICAL IMPLICATIONS
A few pedagogical implications emanating from this study for teaching and learning practices are worth noting. Firstly, the widespread usage and positive perception of Grammarly among students underscore the importance of incorporating technology into writing pedagogy in higher education. Instructors could leverage this importance by integrating Grammarly in structured classroom activities that promote its use as a supplementary tool, thereby enhancing students' autonomous writing skills. The evident reliance on Grammarly for grammatical and spelling checks suggests that curricula could be developed to encourage students to use such tools critically, reinforcing the concept that technology should support, not substitute, the development of writing proficiency. Additionally, recognizing the differential impact of the free and paid versions of Grammarly, educational institutions might consider providing access to the premium service to ensure equitable academic support, particularly for students who may be financially disadvantaged. Secondly, the study's findings on the collective preference for digital assistance over personal help indicate a shift in help-seeking behavior, which has significant implications for academic support services. Writing centers and learning resources need to adapt to this digital preference, perhaps by offering online consultations and digital resource libraries. Also, given that students displayed a significant likelihood of using the paid version of Grammarly if provided, universities should evaluate the cost-effectiveness of institutional subscriptions. Such an initiative could enhance students' writing outcomes and confidence across various writing contexts. The integration of Grammarly and similar applications into educational settings represents a progressive step towards a more technology-empowered learning environment, promoting students' writing competence and confidence in the digital era.

A few other noteworthy implications to how higher education writing centers and writing classrooms can be drawn from the findings. The findings suggest that combining Grammarly with human tutors is an effective strategy for supporting students' writing, consistent with existing research (Dembsey, 2017). In line with prior research (Bailey & Lee, 2020; Thi & Nikolov, 2021), it is suggested that writing instructors and tutors focus on global level writing issues while Grammarly can address local level issues like using correct sentence structure, word choice, punctuation, tense consistency, verb agreement and preposition use. This integrated approach to writing instruction (i.e., Grammarly alongside teacher) can assist in developing academic writing in university courses (Magaba, 2023). With Grammarly, students develop independent learning skills through choosing which corrections to accept, supporting Maulidina and Wibowo's (2022) on its digital spaces. Furthermore, findings here indicate students appreciate the affordances of using Grammarly in the classroom to teach grammatical accuracy, echoing findings from Carter and Harper (2013). Lastly, as indicated by studies from Chapelle et al. (2008), Stevenson and Phakiti (2019), and Javier (2022), the use of Grammarly enables corrective feedback interaction between students

and the digital tools that promote learning experience and the development of critical thinking skills in writing tasks

Regarding connection to the theoretical framework in this study, Grammarly significantly aids in promoting self-regulated help-seeking behaviors by bridging the gap between informal and formal methods of seeking help, offering authoritative support in an accessible, low-pressure manner. It acts not only as a tool for improving grammar and writing but also boosts writing self-efficacy (Umamah & Cahyono, 2022).

It is perceived that while some suggested changes were correct in the literal sense of the English language, those may be out of the context in which the paper was being composed. It is, after all, an aid and is never meant to replace human judgment. In close connection to the abovementioned point, when it comes to actual usage, students seldom use Grammarly as the sole tool to improve their writing. They may use it in conjunction with multiple other resources to help with their writing, some of which include campus tutoring services, campus writing center, professors, friends, and family.

6.0 CONCLUSION

The study's findings suggest practical considerations for educators, administrators, and technology providers. Integrating Grammarly into writing-intensive courses may enhance students' skills, given their positive perceptions. Faculty development programs should equip instructors with Grammarly features, enabling effective guidance. Instructors may consider incorporating specific exercises where students actively use Grammarly to improve spelling, grammar, sentence structure, and confidence.

Institutions could explore providing access to Grammarly's premium version, considering the reported benefits. Negotiating institutional licenses or partnerships may address cost concerns, supporting effective communication and written expression. Educators should be aware of available tools, encouraging responsible use in courses to align with the trend of integrating digital literacy skills into curricula.

The study provides a foundation for future research to deepen understanding of Grammarly's role in students' writing development. Exploring the tool's impact on self-perceived improvement and confidence across disciplines is essential. Investigating its effectiveness in various academic contexts can inform tailored writing support.

6.2 LIMITATIONS

Some limitations of this study should be acknowledged. First, the cross-sectional research design does not account for longitudinal changes in perceptions of Grammarly use. Additionally, self-reporting and convenience sampling from a single university in Middle Tennessee may introduce bias, and the localized cultural context limits the study's generalizability. Socioeconomic factors were also not considered when comparing the paid and free versions of Grammarly. The questionnaire scales consisted of only three items each, which may reduce the robustness of measures for confidence, help-seeking behavior, and Grammarly use. Furthermore, qualitative data was limited to open-ended survey responses, and richer insights could have been obtained through interviews, observations, or focus groups.

Gleaning inferences from cross-sectional, non-randomized studies presents several methodological challenges. The convenience sample used restricts generalizations due to potential threats to external validity. Future research should employ randomized samples from multiple institutions to better detect differences or relationships between groups or variables in a broader context. Despite these limitations, this study provides a valuable baseline for understanding how Grammarly can support student confidence in writing and serve as a stepping stone for further research in this area.Future research may explore the relationship between students' pre-existing confidence in writing and their motivation to use Grammarly. Understanding factors driving students to seek external writing assistance can inform strategies to enhance self-efficacy and intrinsic motivation. Comparative studies with other grammar-checking tools can highlight the unique advantages and limitations of Grammarly, aiding informed decisions. Examining the impact of providing students with institutional access to Grammarly's premium version is crucial, exploring effects on outcomes, satisfaction, and overall learning experience.

Studying motivational factors influencing students' decisions to invest in premium versions of writing tools contributes to our understanding of how to integrate writing tools in higher education. This research can shape best practices and contribute to the evolving landscape of technology-enhanced learning and writing instruction. In conclusion, the study opens avenues for refining writing support in higher education, emphasizing the importance of leveraging digital tools. Future research in this domain can continue to shape best practices and contribute to the evolving landscape of technology-enhanced learning and writing instruction.

Declarations
Availability of Data and Material: Due to Institutional Review Board policies, the data will not be made available.

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