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GRAMMARLY'S INFLUENCE ON ACADEMIC WRITING CONFIDENCE IN HIGH SCHOOL STUDENTS: A QUASI-EXPERIMENTAL STUDY

Abstract

This quasi-experimental study investigates the impact of Grammarly, an AI-powered writing assistant, on the confidence and self-efficacy of high school students in academic writing. Conducted with 48 students from a school of Physics and Mathematics, the research employed a non-randomized design with two groups: an Experimental Group using Grammarly Premium and a Control Group that did not receive technological support. Results indicated that Grammarly significantly reduced writing errors in the EG, compared to a lesser reduction in the CG. Additionally, the EG reported notable improvements in writing confidence and self-efficacy, with increases observed on validated scales. These findings suggest that Grammarly can substantially enhance both the quality of academic writing and students' self-perceptions as writers. The study highlights the potential of integrating digital tools in educational settings to foster better learning outcomes. Limitations include the study's short duration and non-randomized group assignment, pointing to the need for further research to explore long-term effects and broader educational impacts.

Keywords: Grammarly; academic writing; high school students; self-efficacy; confidence; educational technology; writing skills improvement.

Introduction. Academic writing proficiency is a crucial skill for high school students, serving as a foundation for success in higher education and professional endeavors. However, many students struggle with grammatical errors and structural inconsistencies, which can undermine their confidence and self-efficacy in writing tasks. In recent years, technological tools such as Grammarly have gained popularity as aids for improving writing quality by providing real-time feedback on grammar, punctuation, and style (Kretinina et al., 2023).

In Kazakhstan, there has been increasing interest in incorporating digital technologies into educational practices to improve learning outcomes (Kaukenbay, 2024). However, little research has been conducted to assess the specific impact of Grammarly on high school students' academic writing in this context. This study seeks to address this gap by investigating the influence of Grammarly on the confidence and self-efficacy of high school students enrolled in the Global Perspectives and Project Works (GPPW) course at the Nazarbayev Intellectual School of Physics and Mathematics in Almaty. The GPPW course requires students to engage in various research-based writing tasks, making it an ideal setting to evaluate the effects of AI-powered writing assistance on academic performance and students' self-perception as writers.

Grammarly is an AI-powered writing assistant designed to enhance the clarity, coherence, and correctness of written text (Grammarly, 2017). By analyzing text for grammatical errors, spelling mistakes, and stylistic inconsistencies, Grammarly provides users with suggestions for improvement, thereby potentially reducing common pitfalls in academic writing. Research indicates that the use of grammar correction tools like Grammarly can lead to improvements in writing quality and accuracy (Vocabulary. com, 2020).

Studies have suggested that the integration of technology into writing instruction can positively impact students' attitudes and self-perceptions as writers (Fokides & Peristeraki 2024). For instance, Kim and Han (2020) found that the use of grammar correction software in an ESL writing course contributed to increased learner autonomy and confidence in writing tasks. Similarly, Ching et al., (2019) reported that students perceived grammar checkers as valuable tools for self-improvement in writing, leading to enhanced self-efficacy in academic contexts.

Several research initiatives have examined Grammarly's effect on writing skills. Findings from these studies indicate that Grammarly not only aids in enhancing students' grasp of grammatical principles but also bolsters their confidence in composing text. Additionally, investigations have shown that Grammarly significantly enhances the quality of students' written work, fosters greater precision in writing, and positively influences their attitude toward Computer Assisted Language Learning and acquiring English writing skills (Fadhilah et al., 2019; Ghufron & Rosyida 2019). Further evidence from research suggests that Grammarly stimulates students' interest in writing, promotes autonomous learning, and generates enthusiasm for revising their work, thus minimizing errors in grammar, punctuation, spelling, sentence structure, stylistic choices, and vocabulary development (Ghufron & Rosyida, 2018; Yulianti, 2018).

Confidence and self-efficacy play great roles in shaping students' writing behaviors and outcomes. Bandura (1997) defines self-efficacy as the belief in one's capability to successfully execute tasks and achieve desired outcomes. In the context of academic writing, self-efficacy influences students' persistence, effort, and performance (Pajares, 2003). Students with high levels of self-efficacy are more likely to engage in writing tasks, seek out challenging assignments, and persist in the face of obstacles (Zimmerman, 2000). Confidence in writing abilities is closely linked to self-esteem and academic achievement. Students who perceive themselves as competent writers are more likely to approach writing tasks with enthusiasm and perseverance, leading to higher-quality outcomes (Patrick et al., 2018; Ryba et al., 2021). Conversely, students with low confidence may experience anxiety, reluctance, and avoidance behaviors

in writing contexts, hindering their academic progress and inhibiting their growth potential (Vandamme et al., 2019).

The Social Cognitive Theory (Bandura, 1986) provides a theoretical lens through which to understand the relationship between Grammarly support, confidence, and self-efficacy in academic writing. According to this framework, individuals' beliefs about their capabilities (self-efficacy) are influenced by personal experiences, social persuasion, and vicarious learning. By providing students with immediate feedback and corrective guidance, Grammarly may enhance their writing skills and bolster their confidence in their ability to produce coherent and error-free texts. The Theory of Self-Regulated Learning (Zimmerman, 2000) posits that students actively monitor, regulate, and adapt their learning behaviors to achieve academic goals. The use of Grammarly as a self-regulatory tool may empower students to take ownership of their writing process, identify areas for improvement, and implement strategies to enhance their writing proficiency. Through repeated practice and feedback, students may develop a sense of mastery and competence in academic writing tasks, thereby strengthening their self-efficacy beliefs (Ramadan Elbaioumi Shaddad & Jember, 2024; AL Harrasi, 2023).

Materials and Methods. The study was conducted as part of the Global Perspectives and Project Works (GPPW) course, a subject aimed at developing critical thinking, research skills, and the ability to articulate ideas through academic writing. In this course, students are required to engage in various writing tasks, research projects, and presentations, making it an ideal context to examine the influence of Grammarly on academic writing confidence and self-efficacy. The students, all in Grade 11 (aged 17-18 years), being educated at NIS (Nazarbayev Intellectual School) of Physics and Mathematics in Almaty were tasked with producing extended written assignments, which demanded a high level of grammatical accuracy, clarity, and coherence key elements that would benefit from the support of an AI-powered writing assistant like Grammarly.

The authors employed a non-randomized, quasi-experimental design with two groups:

Experimental Group (EG): This group consisted of 24 high school students. The students were introduced to Grammarly Premium on the first day of the intervention and received a brief tutorial on how to utilize its various features. These students were given full access to Grammarly Premium for two weeks, during which they were encouraged to use the platform's features, including real-time grammar and style suggestions, plagiarism detection, and vocabulary enhancement tools. Students in this group used Grammarly while completing various academic writing tasks assigned as part of their GPPW curriculum, such as essays, research papers, and project reports. Although Grammarly's use was not mandatory, students were incentivized to actively engage with the tool, and their usage was monitored to ensure consistent exposure to its features.

Control Group (CG): This group also comprised 24 high school students. They participated in the regular curriculum instruction in academic writing skills but did not receive access to Grammarly or any other additional writing support tool. These students followed the standard curriculum for academic writing in the GPPW subject but did not have access to Grammarly or any other supplementary writing tools during the intervention period. Like the EG, they completed the same writing tasks but relied solely on teacher feedback and peer review for corrections and improvements.

The choice of a quasi-experimental design without randomization was due to logistical constraints within the school setting. Nonetheless, this approach allowed for a meaningful comparison between the groups, while controlling for confounding variables such as teacher instruction and academic writing topics.

Both groups were administered the pre-intervention survey at the start of the study and the post-intervention survey at the end of the two weeks. The surveys were designed to measure any changes in students' confidence

and self-efficacy in academic writing, with particular attention paid to whether Grammarly had a measurable impact on these outcomes in the EG compared to the CG.

Confidence in academic writing was assessed using a 7-point Likert scale, with higher scores indicating greater confidence. Self-efficacy in academic writing was measured using a validated scale and a range of questions considering several levels of self-efficacy (Bandura, 2006).

Results. This study employed primary data, meaning the information was collected directly from the participants (Glen, 2022). The data consisted of two parts:

Quantitative data, where error types and their frequencies were obtained by analyzing participants' writing assignments before and after revision using Grammarly Premium. Minor adaptations were made to error classifications.

Qualitative data, where to gather participants' opinions and experiences, this study applied a survey that consisted of questions exploring participants' behavioral, cognitive, and emotio-

nal engagement with writing, as well as their writing self-confidence related to feedback received, affective filters, and indicators of confidence.

Preliminary analysis revealed no significant differences in baseline confidence and self-efficacy scores between the experimental and control groups ($p > 0.03$). However, post-intervention analysis showed a significant increase in confidence ($t = 2.14$, $p < 0.002$) and self-efficacy ($t = 2.09$, $p < 0.001$) scores in the experimental group compared to the control group.

The experimental group (EG), which used Grammarly Premium for two weeks, showed significant improvements in various categories of writing errors compared to the control group (CG), which did not use Grammarly. The total number of errors decreased markedly in the EG from 794 before using Grammarly to 122 after using Grammarly. In contrast, the CG, which did not have access to Grammarly but had only feedback from teachers, had a slight decrease in the total number of errors from 743 to 646 during the same period as Table 1 demonstrates.

Table 1. *Error types and number of revisions using Grammarly*

Error types	Experimental group		Control group	
	Before using Grammarly	After using Grammarly	Before the teacher's feedback	After the teacher's feedback
Verb form	118	26	126	106
Word choice	75	12	68	48
Word form	32	8	28	19
Articles	98	12	111	87
Spelling	45	3	54	48
Punctuation	135	13	102	116
Preposition	78	5	67	62
S V agreement	31	8	24	21
Sentence structure	85	11	79	81
Informal	97	24	84	58
Total number of errors	794	122	743	646

Percentage of Reduction: EG Error Reduction: 84.6%, CG Error Reduction: 13.1%.

Confidence and self-efficacy assessment. The pre-and post-intervention surveys aimed at assessing confidence and self-efficacy in academic writing.
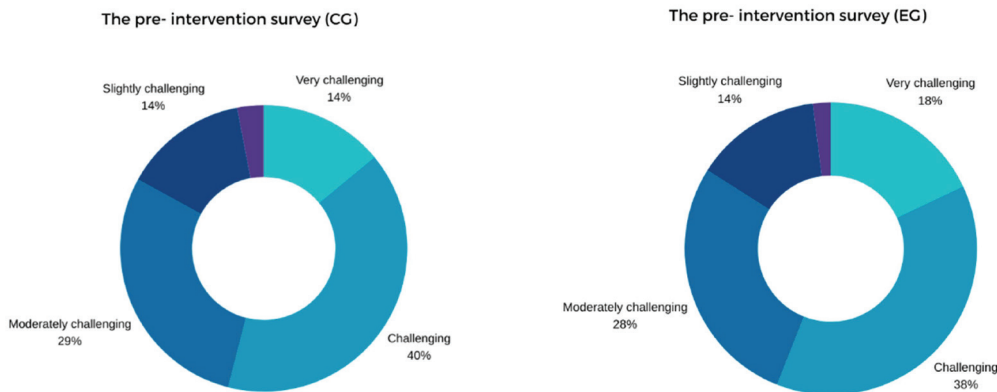
The pre- intervention survey (CG)

The pre- intervention survey (EG)

Figure 1: The pre-intervention survey results for CG and EG

The post- intervention survey (CG)

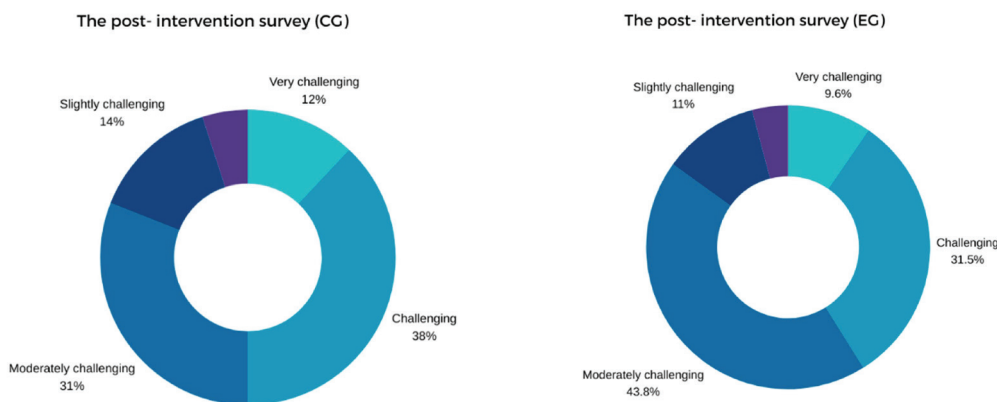The post- intervention survey (EG)

Figure 2: The post-intervention results for CG and EG

As shown in Figure 1 and Figure 2, the surveys revealed significant improvements in students' perception and attitude towards Academic writing assignments in the EG compared to the CG. Confidence levels were identified through the range of options to answer, starting from "Very challenging" and ending with "Not challenging at all".

Change in perceptions of the EG shows a significant decrease in the number of students finding the task «Very challenging» and «Challenging». This indicates a shift towards finding the task less difficult, which could suggest that the intervention (possibly an educational tool or method) was effective in making the task feel easier. There is a slight increase in those finding it «Moderately challenging» and a small increase in those who think it's «Not challenging at all», further supporting the effectiveness of the intervention in improving task approachability or understanding.

Changes in Perceptions of the CG are less pronounced, with minor decreases in the «Very challenging» and «Challenging» categories and small increases in «Moderately challenging» and «Not challenging at all». The relatively stable perceptions suggest that without the intervention, the task's difficulty remained fairly constant for most students. The consistency in the «Slightly challenging» category indicates no significant shift in difficulty perception among a portion of the CG.

Comparing the changes between the EG and CG, it appears that the intervention had a positive impact on the EG, helping them perceive the task as less challenging than the CG. This suggests the effectiveness of whatever method or tool was applied to the EG.

Self-efficacy was measured using a validated scale (Bandura, 2006) as shown in Table 2, and indicated that the EG's average score improved from a pre-intervention average of 2.8 out of 7

on a 7-point Likert scale to 5.6 post-intervention. The CG's scores showed little change, moving from 2.9 to 3.1.

Both groups displayed improvements in confidence and self-efficacy post-intervention, with the EG showing more substantial gains.

Table 2. *Confidence and Self-Efficacy Scores*

Measurement	Group	Pre-intervention	Post-intervention	Change
Confidence	EG	3.4	5.8	+2.4
	CG	3.5	4.1	+0.6
Self-Efficacy	EG	2.9	5.5	+2.6
	CG	3.0	3.4	+0.4

The use of Grammarly Premium significantly aided the EG in reducing the number of writing errors across all categories. This improvement suggests that real-time grammar feedback can effectively enhance the accuracy of student writing. Moreover, the substantial increases in both confidence and self-efficacy scores among the EG participants indicate that access to corrective feedback through Grammarly not only helps improve writing quality but also positively impacts students' beliefs in their writing capabilities. Conversely, the CG's minimal gains highlight the potential limitations of traditional academic writing instruction without supplemental technological support. These findings suggest that tools like Grammarly can play a critical role in enhancing academic writing instruction and student performance.

Discussions. The results of this quasi-experimental study demonstrate that Grammarly support significantly enhances the confidence and self-efficacy of high school students in academic writing. These findings align with previous research, which indicates that digital tools can improve writing quality and affect students' perceptions of their writing abilities positively.

The substantial reduction in grammatical errors among the EG underscores the effectiveness of Grammarly in enhancing academic writing. The EG showed an 84.6% reduction in errors, which starkly contrasts with the 13.1% reduction observed in the CG. This significant disparity highlights Grammarly's role in providing immediate, actionable feedback that is more effective than traditional feedback mechanisms alone. Such feedback likely helps students identify and understand their mistakes in real time, facilitating a deeper learning process and improving their writing skills.

The improvements in confidence and self-efficacy scores in the EG further attest to the benefits of Grammarly. The increase from an average of 3.4 to 5.8 on a 7-point Likert scale for confidence, and from 2.9 to 5.5 for self-efficacy, suggests that continuous engagement with corrective feedback not only aids in decreasing errors but also boosts students' belief in their writing capabilities. This finding is consistent with the Social Cognitive Theory (Bandura, 1986), which posits that successful experiences, such as observing self-improvement in writing, enhance self-efficacy. The CG's minimal gains in these areas highlight the potential limitations of relying solely on traditional teaching methods without supplemental technological support.

From a theoretical standpoint, these results enrich our understanding of how technological interventions like Grammarly can serve as practical tools in educational settings, supporting the Theory of Self-Regulated Learning (Zimmerman, 2000). Practically, the findings suggest that educational institutions might consider integrating such tools into their curriculum to enhance students' writing skills systematically.

It is important to note that Grammarly's impact can vary depending on individual factors and usage patterns (Perdana et al., 2021). While the tool is a valuable resource, it's crucial to

recognize its limitations and supplement its use with human judgment and careful proofreading (O'Neill & Russell, 2019a). To maximize the benefits of Grammarly, educators should provide appropriate instruction and guidance on its use, along with implementing assessment-based evaluation rubrics (Ashrafganjoe et al., 2022). The tool's tendency to overlook or misidentify errors, provide inaccurate or excessive advice, and function only with an internet connection were considered serious drawbacks as well (O'Neill & Russell, 2019b). Furthermore, the free version of Grammarly imposes restrictions on its corrective capabilities, necessitating a paid subscription for full access (Fitriana & Nurazni, 2022). Grammarly's effectiveness in enhancing the structural and substantive aspects of writing may be hindered by its inability to recognize certain proper nouns, particularly those specific to regional or cultural contexts (Javier, 2022). The tool's reliance on a stable internet connection and potentially high-speed internet connectivity can also pose challenges for users (Yousofi, 2022).

Conclusion. In conclusion, this study confirms that Grammarly significantly reduces writing errors and enhances both the confidence and self-efficacy of high school students in academic writing. These findings not only advocate for the integration of advanced technological tools in education but also highlight the importance of providing students with resources that support their writing and learning journeys effectively. As educational technology evolves, its role in fostering educational outcomes and student development will undoubtedly continue to be a critical area of research and application. The study's limitations should be acknowledged despite the aforementioned promising findings. The non-randomized design and the short duration of the intervention may affect the generalizability of the results. Additionally, the study was conducted within a single educational institution, which may limit the applicability of the findings across different educational contexts or cultural backgrounds. Future research should consider longer intervention periods to examine the sustained impact of Grammarly on students' writing skills and self-efficacy. Studies could also explore the effects of Grammarly in different academic disciplines and educational levels to determine its broader applicability. Furthermore, qualitative studies could provide deeper insights into students' subjective experiences and perceptions while using Grammarly, contributing to a more nuanced understanding of how digital tools influence learning processes.

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