

Self-efficacy beliefs for the self-regulation of academic and scientific writing among undergraduate students of pedagogy¹

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Abstract

This study aimed to analyze the self-efficacy beliefs of Pedagogy students regarding the self-regulation of academic and scientific writing. Participants were 77 students from a public university in northern Paraná, Brazil, who completed the Self-Efficacy for Writing Self-Regulation Scale (EAARE). Data were analyzed using descriptive statistics, considering frequencies, means, and standard deviations for the 25 items and valid responses. The overall mean was 4.16 (SD = 1.61) on a 1-to-7 scale, slightly above the theoretical midpoint. The highest means concerned writing effective transitions between ideas, using initial writing attempts to refine ideas, and overcoming difficulties when experiencing writer's block. The lowest means concerned maintaining concentration despite distractions, rewriting long and confusing sentences, meeting the standards of a very demanding evaluator, and producing short and informative titles. The findings indicate variation in self-efficacy beliefs across writing situations, without suggesting a globally negative perception, and highlight the importance of mastery experiences and formative feedback for the development of academic writing in higher education.

Keywords: Self-efficacy; self-regulation; academic writing; higher education; Pedagogy.

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Crenças de autoeficácia para a autorregulação da escrita acadêmica e científica em estudantes de Pedagogia

Resumo

Este estudo teve como objetivo analisar as crenças de autoeficácia de estudantes de Pedagogia para a autorregulação da escrita acadêmica e científica. Participaram 77 estudantes de uma universidade pública do norte do Paraná, que responderam à Escala de Autoeficácia para Autorregulação da Escrita (EAARE). Os dados foram analisados por estatística descritiva, considerando as frequências, médias e desvios-padrão dos 25 itens e das respostas válidas. A média geral foi de 4,16 (DP = 1,61), em escala de 1 a 7, situando-se ligeiramente acima do ponto médio teórico. As maiores médias referiram-se à escrita de transições eficazes entre ideias, ao uso das primeiras tentativas para refinar ideias e à superação de dificuldades quando faltam ideias. As menores médias envolveram a manutenção da concentração diante de distrações, a reescrita de frases longas e confusas, o atendimento a padrões de um avaliador exigente e a elaboração de títulos curtos e informativos. Os resultados indicam variação das crenças conforme a situação de escrita, sem caracterizar percepção globalmente negativa, e reforçam a importância de experiências de domínio e feedback formativo no desenvolvimento da escrita no ensino superior.

Palavras-chave: Autoeficácia; autorregulação; educação superior; escrita acadêmica; Pedagogia.



Creencias de autoeficacia para la autorregulación de la escritura académica y científica entre estudiantes de pregrado de Pedagogía

Resumen

Este estudio tuvo como objetivo analizar las creencias de autoeficacia de estudiantes de Pedagogía para la autorregulación de la escritura académica y científica. Participaron 77 estudiantes de una universidad pública del norte de Paraná, Brasil, quienes respondieron a la Escala de Autoeficacia para la Autorregulación de la Escritura (EAARE). Los datos se analizaron mediante estadística descriptiva, considerando las frecuencias, medias y desviaciones estándar de los 25 ítems y de las respuestas válidas. La media general fue de 4,16 (DE = 1,61), en una escala de 1 a 7, ligeramente superior al punto medio teórico. Las medias más altas correspondieron a escribir transiciones eficaces entre ideas, utilizar los primeros intentos para refinar ideas y superar dificultades cuando faltan ideas. Las medias más bajas se observaron en mantener la concentración ante distracciones, reescribir frases largas y confusas, atender a los estándares de un evaluador muy exigente y elaborar títulos breves e informativos. Los resultados indican variación de las creencias de autoeficacia según la situación de escritura, sin caracterizar una percepción negativa, y destacan la importancia de experiencias de dominio y retroalimentación formativa para el desarrollo de la escritura académica en la educación superior.

Palabras clave: Autoeficacia; autorregulación; escritura académica; educación superior; Pedagogía.



Introduction

Academic and scientific writing constitutes one of the most complex skills required in higher education, as it involves not only the mastery of linguistic and discursive knowledge, but also the mobilization of cognitive, metacognitive, motivational, and self-regulatory processes (Zimmerman; Risemberg, 1997). Producing a high-quality text requires planning, organizing ideas, continuously monitoring one's own production, revising the drafted content, and persisting in the face of difficulties inherent to the writing process. In this context, writing is no longer understood merely as a product, but as a dynamic process that demands students' active participation in managing their own learning (Graham; Harris, 2019; Hayes, 1996; Hayes; Flower, 1980).

Although academic writing represents a continuous requirement throughout university education, many students report difficulties in initiating texts, organizing arguments, revising their work, and adhering to the specific conventions of scientific communication. These difficulties do not stem exclusively from limitations in language proficiency or content knowledge, but also from how students cognitively and motivationally approach the demands of writing. Thus, individuals with similar levels of knowledge may exhibit quite distinct performances when facing the same writing task, indicating that other psychological factors play a role in this process (Han; Apridayani; Sukarsih, 2026; Mitchell et al., 2023; Zimmerman; Bandura, 1994).

Among these factors, self-efficacy beliefs stand out, understood as the judgments individuals make regarding their own capability to organize and execute the actions required to attain designated types of performances (Bandura, 1977, 1997). According to this framework, these beliefs influence the choice of activities, the level of effort expended, persistence in the face of difficulties, resilience following failures, and the quality of performance achieved. Beyond possessing specific skills, it is necessary to believe that one can utilize them effectively in different situation. Consequently, students



with higher self-efficacy beliefs tend to engage more intensely in challenging tasks, persist longer, and recover more quickly from setbacks, whereas fragile beliefs foster task avoidance, reduced effort, and premature abandonment of activities.

According to Bandura (1977, 1997), these beliefs are constructed and continuously updated through four main sources: mastery experiences, considered the most influential source as they reflect successes and failures experienced by the individual; vicarious experiences, derived from observing similar models; verbal persuasion, related to encouragement and feedback received from others; and physiological and affective states, which can be interpreted as indicators of personal competence or vulnerability regarding a given task. Together, these sources help explain why students exposed to similar academic settings develop distinct perceptions of their capabilities.

Within Social Cognitive Theory, however, self-efficacy does not operate in isolation. It integrates a broader system of human functioning in which self-regulation plays a central role. Grounded in the principle of human agency, this perspective views individuals as active participants in their own learning, capable of setting goals, monitoring progress, evaluating outcomes, and adjusting strategies whenever necessary (Bandura, 1986, 1991, 2001). Self-regulation thus constitutes a set of processes through which thoughts, feelings, and actions are systematic oriented toward the attainment of specific goals, playing a decisive role in educational settings (Ramdass; Zimmerman, 2011; Zimmerman, 2000; Zimmerman, 2002).

In the domain of writing, this relationship becomes particularly relevant. Producing academic and scientific texts requires planning, goal setting, time management, constant monitoring, critical revision, and persistence across all stages of the task (Mitchell et al., 2023; Teng; Zhan, 2023). Zimmerman and Risemberg (1997) argue that writing is an inherently self-regulated activity, as it relies on self-initiated thoughts, feelings, and actions designed to enhance both the process and the quality of the written product. From this perspective,



linguistic knowledge and grammar mastery, though essential, are insufficient to fully account for writing performance. How students regulate their behavior and believe in their capability to meet text production demands plays an equally decisive role in their results.

In academic and scientific writing contexts, self-regulation involves the interaction among personal, behavioral, and environmental processes that allow students to continuously plan, monitor, evaluate, and adjust their text production (Zimmerman; Risemberg, 1997). In this process, self-efficacy beliefs play a pivotal role by influencing the perceived capability to organize and execute necessary actions for writing tasks (Zimmerman; Bandura, 1994). Thus, students who believe they are capable of meeting writing requirements tend to set more challenging goals, persist through difficulties, utilize self-regulatory strategies more efficiently, and invest greater effort in revising and refining their texts. Conversely, lower levels of self-efficacy can limit engagement, persistence, and overall writing performance.

This understanding has been corroborated by international investigations demonstrating consistent associations between self-efficacy beliefs, the use of self-regulated learning strategies, and academic writing quality—indicating that students with higher perceived competence plan, monitor, and revise their texts more effectively (Ekholm; Zumbrunn; Conklin, 2015; Mitchell, McMillan; Rabbani, 2019; Mitchell et al., 2023; Teng; Zhan, 2023). Furthermore, studies demonstrate that interventions targeting the explicit instruction of self-regulatory strategies and the enhancement of self-efficacy beliefs lead to significant improvements in students' writing quality and academic performance (Mitchell et al., 2023; Teng; Zhang, 2020; Zhang; Zhang, 2024).

In the Brazilian context, although recent research has broadened the understanding of self-regulated learning in higher education and its relationship with motivational and academic variables (Ganda; Boruchovitch, 2018), investigations specifically examining self-efficacy beliefs for the self-regulation of academic and scientific writing among Pedagogy students remain



relatively scarce. Consequently, evidence remains limited regarding which aspects of writing self-regulation these students perceive greater or lesser capability to face academic demands, as well as the potential implications of these perceptions for their professional training. Nevertheless, studies continue to point out that academic and scientific writing represents a major challenge for undergraduate students (Bueno; Pasian, 2024; Oliveira et al., 2022).

The relevance of this discussion becomes even clearer when considering initial teacher education. Throughout their degree program, Pedagogy students are continuously challenged to produce book reviews, reports, projects, scientific articles, undergraduate theses, and other academic genres that demand writing mastery and the ability to self-regulate this process. However, the importance of this population extends beyond university requirements. As future educators, these students will be responsible for mediating teaching and learning processes in reading and writing, developing instructional materials, evaluating student texts, and creating opportunities for their own pupils to develop writing skills throughout basic education. Thus, understanding how they evaluate their capability to self-regulate their academic writing is a matter of interest not only for individual higher education performance, but also for the training of professionals who will act directly in the development of written language in basic education.

Given this context, the present study sought to answer the following research question: how do Pedagogy students perceive their capability to self-regulate academic and scientific writing? To address this question, the study aimed to analyze Pedagogy students' self-efficacy beliefs for the self-regulation of academic and scientific writing. By identifying the writing dimensions in which these students perceive greater strengths and vulnerabilities, this study seeks to advance knowledge regarding the motivational processes involved in academic writing and offer evidence to inform pedagogical practices capable of fostering both self-regulation development and self-efficacy beliefs during initial teacher training.



Method

This is a quantitative, descriptive, and cross-sectional study. Participants included 77 students regularly enrolled in the Pedagogy degree program at a public university located in northern Paraná State, Brazil. A convenience sample was used, based on course availability and voluntary student participation.

Instrument

Data collection was conducted using the Self-Efficacy for Writing Self-Regulation Scale (*Escala de Autoeficácia para Autorregulação da Escrita - EAARE*), adapted and validated for Brazilian university students by Emilio et al. (2020). The instrument consists of 25 items rated on a seven-point Likert scale, ranging from 1 (“not capable at all”) to 7 (“completely capable”), assessing students’ perceived capability to perform various actions related to writing self-regulation.

In the adaptation and validation study for the Brazilian context, the EAARE demonstrated a unidimensional factor structure comprising all 25 items and satisfactory internal consistency ($\alpha = 0.95$; Emilio et al., 2020). Consequently, in the present study, all 25 items were evaluated jointly to analyze perceived self-efficacy for writing self-regulation.

Data Collection Procedures

Data collection was conducted following authorization from the educational institution and the faculty members responsible for the courses. The study protocol was submitted to and approved by the institution’s Institutional Review Board (Human Research Ethics Committee), adhering to ethical principles governing research involving human participants.

The scale was administered in a group setting at the beginning of regularly scheduled classes, following a presentation of the research objectives and the signing of the Informed Consent Form by the participants. Completing the instrument took approximately 15 minutes.



Data Analysis Procedures

Data were analyzed using descriptive statistics. For each of the 25 items, response frequencies, means, and standard deviations were calculated based on the 1-to-7 response scale. The overall mean and standard deviation of valid responses across all items were also calculated as descriptive measures of global perceived self-efficacy for writing self-regulation.

Results were interpreted by comparing item means against the theoretical midpoint of the scale (4 points), without adopting normative cut-off scores to classify participants into self-efficacy levels. In addition, items with the highest and lowest means were examined to identify writing-related skills in which participants reported greater or lesser perceived capability.

During data screening, missing values were observed for one item. Item 16 yielded 70 valid responses, corresponding to seven missing responses. Descriptive statistics for this item were computed based on the available data.

Results and Discussion

The results obtained through the Self-Efficacy for Writing Self-Regulation Scale (*Escala de Autoeficácia para Autorregulação da Escrita* – EAARE) are presented in Table 1.



Table 1 - Response Distribution and Descriptive Statistics for Items of the Self-Efficacy for Writing Self-Regulation Scale (EAARE).

Item	1	2	3	4	5	6	7	M	DP
1. Write appropriately about the topic within a short timeframe.	1	3	14	17	23	14	5	4,56	1,33
2. Start writing a text without difficulty.	3	8	10	27	14	9	6	4,19	1,50
3. Quickly construct a good introductory sentence.	1	7	14	20	16	13	6	4,38	1,46
4. Create an opening paragraph that engages reader.	3	5	21	23	19	4	2	3,91	1,26
5. Write a brief and informative general introduction.	1	5	13	20	24	9	5	4,40	1,33
6. Use initial writing drafts to refine ideas.	1	5	6	22	17	18	8	4,75	1,42
7. Adapt the writing style to meet the needs of different audiences.	0	7	7	25	13	15	10	4,68	1,46
8. Maintain focus in the face of distraction.	12	10	22	19	9	5	0	3,23	1,42
9. Manage time under the pressure of tight deadlines.	3	16	11	20	16	4	7	3,91	1,61
10. Adhere to the writing standards of a highly demanding evaluator.	5	13	21	15	17	4	2	3,60	1,44
11. Develop relevant examples to illustrate a key point in the text.	5	8	9	22	10	11	12	4,36	1,77
12. Rewrite long and confusing sentences to improve clarity.	5	10	25	21	7	6	3	3,58	1,43
13. Use precise language to clarify abstract ideas.	3	14	9	20	17	10	4	4,04	1,56
14. Locate and utilize appropriate sources for academic evidence.	0	10	25	15	8	7	12	4,17	1,65
15. Write effective transitions between ideas.	2	7	8	15	9	26	10	4,82	1,64
16. Refocus attention during the writing process.	11	7	9	4	23	6	10	4,13	1,98
17. Generate a variety of strong topics for the main sections.	1	8	9	23	15	16	5	4,44	1,45
18. Incorporate compelling citations from an authority on the subject.	0	12	17	20	5	15	8	4,23	1,61
19. Find strategies to overcome writer's block when running out of ideas.	3	10	10	15	7	8	24	4,73	1,96
20. Maintain motivation when writing about an unengaging topic.	4	15	22	9	11	5	11	3,87	1,80

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21. Identify and correct grammatical errors in a long or complete text.	5	12	11	22	17	7	3	3,87	1,52
22. Revise the first draft to make it more concise and organized.	4	20	18	7	6	21	1	3,75	1,73
23. Identify and correct grammatical errors in complex text.	5	3	10	27	15	7	10	4,36	1,58
24. Find individuals to provide constructive feedback on initial drafts.	2	4	20	22	10	12	7	4,27	1,49
25. Create a short and informative title for a complex topic	6	10	26	15	9	5	6	3,65	1,60

Source: Elaborated by the author.

Note: *M* = mean; *SD* = standard deviation. For item 16, seven missing responses were recorded (*n* = 70).

Considering the 25 items of the instrument, valid responses were analyzed, as Item 16 contained seven missing values. Item means ranged from 3.23 to 4.82 on a 1-to-7 scale. The overall mean for valid responses was 4.16 ($SD = 1.61$), placing it slightly above the theoretical midpoint of the scale (4). This result points to an overall perceived capability near an intermediate level, without allowing, based on this value alone, for a normative classification of participants into discrete self-efficacy levels. The dispersion observed also reflects variability in students' perceptions across the different writing situations assessed.

The distribution of responses reveals, however, that this overall perception is not uniform across different writing skills. The highest means were observed in items related to the capability to write effective transitions between ideas ($M = 4.82$; $SD = 1.64$), use initial writing drafts to refine ideas ($M = 4.75$; $SD = 1.42$), and find ways to overcome difficulties when running out of ideas ($M = 4.73$; $SD = 1.96$). These findings suggest higher perceived capability in situations involving the organization and development of ideas during text production. Relatively high means were also observed for adapting writing style to the needs of different audiences ($M = 4.68$; $SD = 1.46$) and writing



appropriately about a given topic within a short timeframe ($M = 4.56$; $SD = 1.33$).

In contrast, the lowest means were identified in situations involving maintaining concentration in the presence of distractions ($M = 3.23$; $SD = 1.42$), rewriting long and confusing sentences for clarity ($M = 3.58$; $SD = 1.43$), meeting the writing standards of a highly demanding evaluator ($M = 3.60$; $SD = 1.44$), and crafting short, informative titles for complex topics ($M = 3.65$; $SD = 1.60$). This pattern indicates that while students did not exhibit an overall low self-efficacy perception, specific writing situations are perceived as less favorable to their execution capabilities.

The finding regarding concentration warrants particular consideration. The item evaluating the capability to maintain focus during writing despite distractions yielded the lowest mean across the instrument ($M = 3.23$). Within Social Cognitive Theory, this result can be understood as a lower perceived capability to navigate a specific task condition, rather than evidence of an attentional deficit or cognitive impairment among participants. Self-efficacy refers to self-referential beliefs about executing designated actions under specific conditions; hence, the result must be interpreted at the level of self-reported perception. This distinction is especially important because data collection occurred in a collective classroom setting during regular instructional time, where situational conditions may have influenced responses to concentration-related items.

Literature on writing self-efficacy in higher education reinforces the necessity of such contextual interpretations. In a scoping review encompassing 50 studies with undergraduate and graduate students, Mitchell et al. (2023) identified a wide diversity of contexts and instruments used to investigate writing self-efficacy. The authors also highlight the influence of aspects such as instructional climate, faculty attitudes, feedback, and writing context features, advocating for situated approaches to understand this construct. Thus,



perceived writing capability should not be viewed as a fixed trait independent of the demands and conditions under which writing occurs.

This perspective also helps interpret results regarding text revision and refinement. The relatively lower means observed for items related to sentence clarity, meeting evaluative standards, and title generation do not imply low writing quality or objective revision deficits. Rather, they specifically indicate lower perceived capability to perform these specific operations. This distinction is vital because the EAARE assesses self-efficacy beliefs, not actual writing performance. Literature demonstrates that the relationship between writing self-efficacy and performance is not uniform; for instance, in the review by Mitchell et al. (2023), although writing performance was the most frequently examined outcome variable alongside self-efficacy, reported associations were variable and context-dependent.

Empirical studies further reinforce the caution required when equating self-beliefs with observed behaviors. Mitchell, McMillan, and Rabbani (2019), investigating undergraduate nursing students, found that individuals with lower self-efficacy and higher writing anxiety exhibited distinct patterns of help-seeking and engagement with feedback. However, no consistent self-efficacy patterns emerged regarding revision habits or the decision to start assignments early. This finding is particularly relevant to the present study, illustrating that lower perceived capability in a specific writing aspect does not automatically imply that a student will omit or inadequately execute the corresponding behavior.

The significance of context is further underscored by Ekholm, Zumbrunn, and Conklin (2015), who found among college students that perceptions of received feedback partially mediated the relationship between writing self-efficacy and writing self-regulation beliefs. This insight frames academic writing as a process where personal beliefs, learning experiences, and pedagogical conditions intersect. In the present study, specific feedback experiences or instructional practices were not measured; thus, this literature serves as an



interpretive framework rather than a direct explanatory factor for the observed findings.

Another relevant consideration concerns the nature of writing tasks performed by participants. The sample comprised Pedagogy students embedded in a curriculum involving diverse academic and professional writing genres. Perceived capability toward a general writing task may not fully align with perceived capability across specific genres such as reports, projects, book reviews, lesson plans, undergraduate theses, or research papers. This possibility aligns with recent literature emphasizing the situated nature of higher education writing tasks and environments.

Accordingly, lower scores on specific items should not be interpreted purely as individual limitations. Certain situations assessed by the EAARE may be perceived as more demanding by students who are still building familiarity with academic and scientific writing conventions. This hypothesis is especially pertinent for items involving meeting strict evaluator standards, revising complex texts, drafting informative titles, or maintaining concentration. Future studies could explore this dimension by comparing different text genres and production contexts, or by employing tools tailored specifically to the writing demands of teacher education.

Literature also suggests that task characteristics can moderate the relationship between self-efficacy, self-regulation, and performance. Teng and Zhan (2023), studying 270 Chinese undergraduates engaged in academic writing in English, found that task complexity and language proficiency directly impacted performance, while self-efficacy and self-regulated strategy use mediated the link between task complexity and writing performance. Although the linguistic and educational setting differs from the present study, these results emphasize the need to evaluate task demands and student beliefs concurrently rather than treating self-efficacy in isolation.

Through the lens of Social Cognitive Theory, these findings reflect how self-efficacy beliefs are constructed and modified through interactions among



personal factors, behaviors, and environmental conditions. Perceived writing capability is strengthened through mastery experiences, modeling, social persuasion, and affective state interpretations (Bandura, 1997). In university settings, providing opportunities for progressively challenging writing tasks, formative feedback, and observation of experienced writers can foster both skill acquisition and self-efficacy beliefs.

This interpretation aligns with Mitchell et al. (2023), who highlight instructional practices and explicit writing instruction as critical components in higher education self-efficacy research. Their review emphasizes viewing writing as a process, incorporating formative feedback, and conducting longitudinal studies to track belief trajectory changes over time.

Overall, the data do not support characterizing participants' beliefs as predominantly negative. The pattern is best described as a global perception near the scale midpoint, accompanied by variability across specific writing scenarios. Students reported higher perceived capability in organizing and developing ideas, and lower perceived capability in managing distractions, revising, and adapting text to rigorous standards. This heterogeneity is key, as it prevents overgeneralized conclusions and demonstrates that distinct components of the writing process are evaluated differently by students.

From an educational standpoint, these results highlight the necessity of treating academic and scientific writing in higher education as an explicit process to be taught, rather than a prerequisite skill. In Pedagogy programs, practices combining explicit strategy instruction, revision opportunities, progressive text drafting, and formative feedback can support skill development and provide the mastery experiences necessary to build robust self-efficacy beliefs. Nevertheless, intervention studies are required to confirm whether shifts in instructional practices directly enhance self-efficacy beliefs and subsequent self-regulated writing behaviors.



Concluding remarks

This study aimed to analyze the self-efficacy beliefs of pedagogy students regarding the self-regulation of academic and scientific writing. The results indicated an overall perception of capability close to the scale's midpoint, with a mean of 4.16 ($SD = 1.61$), accompanied by variation across the different writing situations evaluated.

The highest means were observed in skills related to writing transitions between ideas, using initial writing drafts to refine ideas, and the ability to overcome difficulties when facing writer's block during textual production. In contrast, the lowest means were concentrated on maintaining focus in the face of distractions, rewriting long and confusing sentences, adhering to the writing standards of a highly demanding evaluator, and creating short and informative titles. This pattern suggests that self-efficacy beliefs are not homogeneously distributed across different writing situations, demonstrating higher or lower perceptions of capability depending on the nature of the task.

The findings should be interpreted considering that the EAARE assesses self-efficacy beliefs rather than textual performance, quality of written production, or directly observed self-regulation behaviors. Thus, the lower means found in certain items do not allow, in isolation, for the inference of objective difficulties in these skills. Similarly, the results do not support a global characterization of the participants' beliefs as predominantly negative.

From an educational perspective, the results reinforce the importance of higher education considering academic and scientific writing as a process that can be taught and developed, offering systematic opportunities for practice, revision, formative feedback, and the progressive development of writing skills. In light of Social Cognitive Theory, mastery experiences, feedback, and other sources of information regarding one's own capability can contribute to building and strengthening self-efficacy beliefs.



The need to consider the specific characteristics of writing contexts within pedagogy training is also highlighted. Future studies could investigate self-efficacy beliefs across different academic and professional genres, as well as examine their relationship with effective self-regulation practices, textual performance, and feedback experiences. Longitudinal investigations and intervention studies could contribute to understanding how these beliefs change throughout university training and to what extent specific pedagogical practices can foster their development.

Limitations include the use of a convenience sample and the cross-sectional design, which restrict the generalization of the results and do not allow for the establishment of causal relationships. Furthermore, as a self-report measure, the results reflect the participants' perceptions of their own capability to self-regulate writing. Despite these limitations, the study contributes to broadening the understanding of self-efficacy beliefs related to the self-regulation of writing in the university context, highlighting the importance of educational practices that articulate the development of writing skills and the strengthening of capability beliefs

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- 1 Statement on the Use of Artificial Intelligence – Gemini, an artificial intelligence tool developed by Google, was used to assist in translating this article into English. The translated version was fully reviewed and adjusted by the editorial team to ensure fidelity to the original text, terminological accuracy, and compliance with the journal's editorial standards. The tool was not used to generate the article's arguments, analyses, or academic content.





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