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ARTICLE

Gendered Dimensions of Metacognitive Writing Strategies and English Writing Self-Efficacy among Female Health Sciences Undergraduates in the Davao Region

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ABSTRACT

This study investigated the relationship between metacognitive writing strategies and English writing self-efficacy among female health sciences undergraduate students in the Davao Region, Philippines. Anchored in Flavell's (1979) Theory of Metacognition (metacognitive knowledge and metacognitive strategies) and Bandura's Social Cognitive Theory (personal and behavioural factors), a quantitative descriptive-correlational design was implemented across three higher education institutions. A sample of 300 bona fide female health sciences undergraduates, drawn from a population of 1,200, selected via proportionate stratified random sampling, completed validated, standardized survey questionnaires. Descriptive statistics and Pearson product-moment correlation analysis were conducted to evaluate variable levels and test for significant associations. Results indicated that students exhibited moderate overall levels of metacognitive writing strategies and moderate English writing self-efficacy. Furthermore, a strong, statistically significant positive correlation was observed between metacognitive writing strategies and English writing self-efficacy. These findings highlight that higher engagement in self-regulatory cognitive strategies is closely linked to stronger writing efficacy beliefs. The paper concludes with pedagogical implications for embedding explicit metacognitive instruction within L2 health-discipline writing curricula.

Keywords: metacognitive strategies, writing self-efficacy, EFL writing, undergraduate students, correlational study, Philippines

1. INTRODUCTION

Many college students find it hard to write in English, and a main reason is that they do not believe they can write well. This low belief, called low writing self-efficacy, shows when students doubt their ability to form ideas, organise a text, use correct grammar, and manage their own writing process (D. Li, 2022; Teng et al., 2018). Students with low writing self-efficacy tend to avoid writing tasks, give up when tasks become difficult, and produce weaker work (Sari & Setyowati, 2021; Pajares, 2003). This is a serious problem because writing self-efficacy predicts how much effort students put in, how long they persist, and how well they perform in second language (L2) writing (Alshahrani, 2025; Zimmerman & Bandura, 1994).

This problem has been reported in many countries. In Northern Europe, Yin et al. (2024) found that international university students who felt burned out also had low English writing self-efficacy. In China, Jin (2023) found low writing self-efficacy among many undergraduates, linked to few chances for real writing practice, grammar-focused teaching, test pressure, and fear of making language errors. A meta-analytic review by Li (2022) showed that low writing self-efficacy often comes with high writing anxiety. In Indonesia, Djatmika et al. (2022) grouped university writers into profiles based on their

growth mindset, self-efficacy, and metacognition, showing that writing confidence and students' thinking about their writing should be studied together.

The same problem exists in the Philippines, where English is the primary language of instruction in higher education. In Metro Manila, Ochoa (2025) reported that even with national English standards in place, high academic demands and limited real-world writing practice led students to doubt their ability to express their ideas in writing. In Davao City, Acain et al. (2025) found that college students still struggle with demanding academic writing, such as theses. The problem weighs more on health sciences students. Their programs require exact written work, such as clinical documentation, case reports, and research papers, and weak writing confidence can affect both their studies and their later communication as health professionals (Mitchell et al., 2017).

One factor that may explain why some students are more confident writers than others is their use of metacognitive writing strategies. These are the ways students think about and control their own writing, such as planning before writing, checking their work while writing, and reviewing it after writing (Qin et al., 2022; Teng, 2020). Writing self-efficacy does not operate in isolation; it is closely tied to these self-regulatory processes (Sun & Zhang, 2022; Teng et al., 2021).

Although many studies have linked these two variables (Wang et al., 2023; Sun & Zhang, 2022; Teng et al., 2021), most were done in East Asian or Western settings or among general humanities and senior high school students (Ochoa, 2025). Little is known about health sciences undergraduates in Philippine regional higher education institutions (HEIs). Little is known about female students as a distinct group, even though women make up most of the health workforce (Boniol et al., 2019), and studies on gender and writing self-efficacy yield mixed results (Villalón et al., 2015; Pajares & Valiante, 2001). Studies in the region also show that women in academic and scientific fields still face gender-related barriers, such as caregiving duties, social expectations, and limited support for growth (Diez & Dupa, 2026; Villegas et al., 2025). This study addresses these gaps by providing local evidence to guide writing instruction in the health sciences.

Theoretical Framework

This study is anchored on two theories (Table 1). The first is Flavell's (1979) Theory of Metacognition. Flavell described four parts of cognitive monitoring: metacognitive knowledge, metacognitive experiences, goals (or tasks), and actions (or strategies). This study used two of these parts. The first is metacognitive knowledge, which is what learners know about themselves as learners (person knowledge), about what a task requires (task knowledge), and about which strategies work (strategy knowledge).

Table 1. Alignment of the Theories, Variables, and Research Questions.

Theory	Part of the theory addressed	Variable and indicators measured	Research question
Flavell's (1979) Theory of Metacognition	Metacognitive knowledge	Metacognitive writing strategies: person, task, and strategy knowledge	RQ 1
	Metacognitive strategies (actions)	Metacognitive writing strategies: planning, monitoring, and evaluating	RQ 1
Bandura's Social Cognitive Theory (1986, 1997)	Personal factor (self-efficacy beliefs)	English writing self-efficacy: ideation, organization, grammar, language use, and self-regulation	RQ 2
	Link between the behavioural factor and the personal factor	Relationship between metacognitive writing strategies (behaviour) and English writing self-efficacy (belief)	RQ 3

Note: Flavell's metacognitive experiences and Bandura's environmental factor were not measured as variables. The environmental factor (the academic setting of health sciences programs in the Davao Region) served as the context of the study. RQ = research question.

The second is metacognitive strategies, which are the actions learners take to control their thinking: planning, monitoring, and evaluating. Together, these two parts form the six dimensions of the metacognitive writing strategies variable. Metacognitive experiences, the thoughts and feelings that arise during a task, were not measured; they are used only to explain how strategy use may shape students' beliefs.

Meanwhile, Bandura's Social Cognitive Theory (Bandura, 1986, 1997) was also used in this paper. Its main idea, triadic reciprocal determinism, is that personal, behavioural, and environmental factors influence one another. This study addressed two of the three factors. The personal factor is English writing self-efficacy, which is students' belief in their ability in ideation, organisation, grammar, language use, and self-regulation. The behavioural factor is the metacognitive writing strategies that students use when they write. The environmental factor, namely the academic setting of health sciences programs in the Davao Region and their writing demands, was not measured as a variable but served as the study's context. Bandura (1997) also explained that self-efficacy grows mainly from mastery experiences. When students plan, monitor, and evaluate their writing, they are more likely to succeed, and these successes can raise their belief in their ability.

The two theories meet at one point. Flavell's metacognitive knowledge and strategies describe what students know and do when they write (behaviour), while Bandura's personal factor describes how confident they are as writers (belief). This study therefore tested whether this behaviour is linked to this belief. Table 1 shows how each part of the two theories was matched with the variables and the research questions of the study.

Statement of the Problem

Female health sciences undergraduates in the Davao Region are often required to write in English for their courses, yet many lack confidence in academic writing. It is not yet known whether the way these students manage their writing (metacognitive writing strategies) is linked to how confident they are as writers (English writing self-efficacy). This study therefore examined the relationship between these two variables. It sought to answer the following research questions (RQs):

a. What is the level of metacognitive writing strategies of female health sciences undergraduates in the Davao Region in terms of (a) metacognitive knowledge, namely person, task, and strategy knowledge (Flavell's metacognitive knowledge); and (b) metacognitive regulation, namely planning, monitoring, and evaluating (Flavell's metacognitive strategies)?
b. What is the level of English writing self-efficacy of female health sciences undergraduates in the Davao Region in terms of ideation, organisation, grammar, language use, and self-regulation (Bandura's personal factor)?
c. Is there a significant relationship between metacognitive writing strategies (Bandura's behavioural factor) and English writing self-efficacy (Bandura's personal factor) among female health sciences undergraduates in the Davao Region?

Hypothesis

H_0: There is no significant relationship between metacognitive writing strategies and English writing self-efficacy among female health sciences undergraduates in the Davao Region.

2. METHODOLOGY

Research Design

This study utilised a quantitative descriptive-correlational research design. This design enables objective quantification of variables and statistical testing of relationships without manipulating the natural setting. It was chosen to measure the levels of metacognitive writing strategies and English writing self-efficacy and to evaluate the direction and magnitude of their linear relationship within an academic writing context.

Respondents and Sampling Procedure

The target population was female senior undergraduate students enrolled in health sciences programs (Nursing, Pharmacy, Medical Technology, and related programs) in three HEIs in the Davao Region (Region XI), Philippines. The total population was 1,200 female health sciences students enrolled during the second semester of AY 2024-2025 (HEI A = 500; HEI B = 400; and HEI C = 300) based on the enrollment records of the participating HEIs. From this population, a sample of 300 was drawn; the sample size was computed using Raosoft with a 5% margin of error, a 95% Confidence level, and a 50% response distribution. Proportionate stratified random sampling was used, with each HEI as a stratum, so that each HEI was represented in proportion to its enrollment size. Within each stratum, students were chosen by simple random sampling using computer-generated random numbers from the enrollment lists. Only full-time female undergraduates enrolled in health sciences programs during the data collection period were included. Students were excluded if they were enrolled in non-health sciences programs, were transferees without an established academic standing, were alumni, or were on official leave of absence at the time of data collection.

Health sciences programs were chosen for three reasons. First, these programs require a great deal of writing in English, such as nursing care plans, clinical documentation, laboratory and case reports, and research papers, where errors can affect patient care and communication among health workers (Mitchell et al., 2017). Second, writing in these fields requires students to plan, check, and review their work carefully, making them a fitting group for studying metacognitive writing strategies. Third, few studies have looked at these variables among health sciences students in Philippine regional HEIs.

Only female students were included for two reasons. First, health sciences programs and the health workforce are made up mostly of women; worldwide, women make up about 70% of health workers (Boniol et al., 2019). Therefore, studying female students describes the main group these programs serve. Second, prior studies show that gender can shape writing beliefs, but the results are mixed: some report gender differences in writing self-efficacy (Pajares & Valiante, 2001), while others find none (Villalón et al., 2015). Limiting the sample to one gender kept gender constant, so the link between the two main variables would not be confounded by gender differences. This is the gendered dimension referred to in the title; the study describes female students and does not compare them with male students.

Research Instruments

Metacognitive Writing Strategies Scale

Adopted from Qin et al. (2022), this instrument evaluates metacognitive knowledge (Person, Task, Strategy) and metacognitive regulation (Planning, Monitoring, Evaluating) using a 5-point Likert scale (ranging from 1 = Never to 5 = Always). In its original validation, the scale showed high internal consistency, with subscale Cronbach's alpha values from 0.81 to 0.90. In the present study, the reliability coefficient of the whole scale was Cronbach's α =0.98 in the pilot test (n = 30) and α = 0.98 in the actual sample (N = 300).

English Writing Self-Efficacy Scale

Adapted from Alfaifi (2021), this instrument measures self-efficacy dimensions across Ideation, Organisation, Grammar, Language Use, and Self-Regulation for writing on a 5-point Likert scale (1 = No Confidence, 2 = Little Confidence, 3 = Moderate Confidence, 4 = Much Confidence, and 5 = Complete Confidence). Psychometric evaluation yielded strong internal reliability (Cronbach's α = 0.88 – 0.90). In the present study, the reliability coefficient of the whole scale was Cronbach's α = 0.96 in the pilot test (n = 30) and α = 0.96 in the actual sample (N = 300). Both coefficients exceed the 0.80 standard for good internal consistency, indicating that each instrument measured its variable reliably.

Data Collection, Ethical Considerations, and Analysis

Ethical clearance was secured from the University of the Immaculate Conception Research Ethics Committee (UIC-REC) (Protocol No. GS-ER-10-25-0399) prior to field implementation. Administrative approvals were obtained from participating HEI presidents and deans. Pre-testing was conducted with $n = 30$ non-sample undergraduates to re-verify construct stability ($\alpha > 0.80$). The reliability coefficient of each instrument from the pilot test is reported in the Research Instruments section.

On-site data collection followed a strict protocol. Participants received Informed Consent Forms (ICFs) detailing study objectives, voluntary involvement, and confidentiality rights under the Data Privacy Act of 2012. Surveys were administered in controlled classroom settings and required approximately 30 minutes. Data were anonymised and stored securely in encrypted digital repositories.

Statistical analyses were conducted using IBM SPSS Statistics 31. Descriptive statistics, including means and standard deviations, were computed to summarise the levels of the study variables. Prior to inferential analyses, the assumptions underlying Pearson's product-moment correlation were examined. Univariate normality was assessed using the Shapiro–Wilk test, supplemented by visual inspection of normal Q–Q plots. Bivariate linearity and homoscedasticity were evaluated through scatterplots. After confirming that these assumptions were adequately met, Pearson's product-moment correlation coefficient (r) was employed to examine the relationship between metacognitive writing strategies and English writing self-efficacy. Statistical significance was established at the 0.05 alpha level. The null hypothesis (H_0) was tested at this level of significance.

3. RESULTS AND DISCUSSION

Level of Metacognitive Writing Strategies and Writing Self-Efficacy

Table 2. Levels of metacognitive writing strategies and writing self-efficacy ($N = 300$) among female undergraduate students in the health sciences programmes in Davao City, Philippines.

Construct / Dimension	Mean	Standard Deviation	Descriptive Level*
Metacognitive Writing Strategies	**2.73**	**0.60**	**Moderate**
Person Knowledge	4.00	0.65	High
Task Knowledge	3.40	0.62	High
Strategy Knowledge	3.00	0.63	Moderate
Planning	2.00	0.65	Low
Monitoring	2.00	0.71	Low
Evaluating	2.00	0.73	Low
English Writing Self-Efficacy	**3.23**	**0.52**	**Moderate**
Ideation	2.67	0.64	Moderate
Organization	3.00	0.64	Moderate
Grammar	2.75	0.61	Moderate
Language Use	3.88	0.56	High
Self-Efficacy for Self-Regulation	3.86	0.63	High

**Range of scales: 1.00–1.80 (Very Low), 1.81–2.60 (Low), 2.61–3.40 (Moderate), 3.41–4.20 (High), 4.21–5.00 (Very High).*

As shown in Table 2, students reported a moderate overall level of metacognitive writing strategies ($M = 2.73$; $SD = 0.60$). A subscale breakdown reveals a notable contrast: while declarative knowledge dimensions such as Person ($M = 4.00$) and Task ($M = 3.40$) were high, operational regulatory behaviours—specifically Planning ($M = 2.00$), Monitoring ($M = 2.00$), and Evaluating ($M = 2.00$)—remained low. This indicates that while students are aware of their characteristics as writers and of task constraints, they infrequently engage in active regulatory behaviours during L2 composition. This pattern aligns with Teng (2020) and Fan and Wang (2024), who documented similar gaps between metacognitive awareness and active regulation among L2 writers.

English writing self-efficacy overall was moderate ($M = 3.23$; $SD = 0.52$), reflecting cautious confidence. Lower scores in Ideation ($M = 2.67$) and Grammar ($M = 2.75$) indicate persistent linguistic uncertainty, whereas higher scores in Language Use ($M = 3.88$) and Self-Efficacy for Self-Regulation ($M = 3.86$) suggest confidence in structural execution. These findings align with Zhao and Liao (2021), who observed that developing academic writers frequently exhibit localised self-doubt regarding idea formulation and grammatical mechanics.

Correlation Between Metacognitive Writing Strategies and Self-Efficacy

Table 3. Correlation between metacognitive writing strategies and writing self-efficacy among female undergraduate students in the health sciences programmes in Davao City, Philippines.

Variables	*p*	Decision
Metacognitive Writing Strategies English Writing Self-Efficacy	$p < 0.001$	Rejected

The bivariate correlation revealed a statistically significant, strong positive relationship between metacognitive writing strategies and English writing self-efficacy ($r = 0.793$, $p < 0.001$), leading to the rejection of the null hypothesis. The coefficient of determination ($R^2 = 0.629$) indicates that approximately 62.9% of the variance in English writing self-efficacy is explained by students' use of metacognitive strategies.

These results support the two theories in the specific parts that this study addressed. In Flavell's (1979) Theory of Metacognition, the results show a gap between the two measured parts. Students scored high in metacognitive knowledge (person and task knowledge) but low in metacognitive strategies (planning, monitoring, and evaluating). This means they know about themselves as writers and their writing tasks, but they do not often put this knowledge into practice. Metacognitive experiences were not measured, but the low regulation scores suggest that students may have few opportunities to notice and act on their thinking while writing.

For Bandura's Social Cognitive Theory (Bandura, 1986, 1997), the strong positive link between the behavioural factor (metacognitive strategy use) and the personal factor (writing self-efficacy) supports the idea that what students do and what they believe affect each other. When students plan, monitor, and evaluate their writing, they are more likely to succeed, and these mastery experiences, which Bandura (1997) named as the strongest source of self-efficacy, can build their confidence. In turn, confident students are more willing to use these strategies (Pajares, 2003; Zimmerman & Bandura, 1994). The environmental factor was not measured; the writing demands of health sciences programs served as the shared setting in which this link was observed. Because the design is correlational, the direction of this link cannot be confirmed. These results agree with Wang et al. (2023), Sun and Zhang (2022), and Teng et al. (2021), who, through structural modelling, showed that planning and monitoring strategies are linked to higher self-efficacy in L2 contexts.

Implications of the Findings

These results have clear implications for teaching. The main gap is not in what students know but in what they do. Students know themselves as writers and understand what their tasks require, yet they seldom plan, monitor, and evaluate their writing. Writing instruction in health sciences programs should therefore move from telling students about strategies to having them practise these strategies in real tasks. English for Specific Purposes (ESP) and research writing instructors may use graphic organisers for planning, monitoring checklists while drafting, and peer evaluation prompts after drafting, and they may model these steps aloud before students try them on their own (Zhao & Liao, 2021; Teng, 2020). These strategies can be built into the writing that students already do, such as nursing care plans, case reports, laboratory reports, and research papers. Although the design cannot show cause and effect, the large share of variance in writing self-efficacy linked to strategy use (62.9%) suggests that such training may raise students' confidence as well as their skills. Teachers may also give focused support in ideation and grammar, the two areas where students felt least confident, through guided brainstorming, outlining, and short cycles of grammar feedback.

The results also matter beyond the classroom. Health professionals must write clear and accurate records, and errors in written communication can affect patient care and teamwork among health workers (Mitchell et al., 2017). Students who regularly plan, check, and review their writing, and who feel confident doing so, are more likely to carry these habits into clinical documentation. Building metacognitive writing habits during college may therefore support safer and clearer communication in future health practice.

From a gender perspective, the findings describe the group that makes up most of the health workforce (Boniol et al., 2019). Since all respondents were female, the results do not show that women differ from men; rather, they show what kind of writing support female health sciences students need. Women in academic and scientific fields in the region still carry added demands, such as caregiving duties and social expectations (Diez & Dupa, 2026; Villegas et al., 2025). Writing support that is flexible and easy to reach, such as writing centres, short workshops, online modules, and peer mentoring, may help female students build their strategy use without adding to these burdens. Faculty members who understand Gender and Development (GAD) principles are in a better position to design such gender-responsive teaching (Valentin & Salmon, 2025). Academic administrators may therefore include metacognitive writing support in the curriculum and in GAD-related plans of health sciences programs, linking it with discipline-specific clinical documentation skills. In line with Villegas (2025), these efforts should move beyond policy compliance toward real support that helps female students succeed in their studies and in their future work.

These implications should be read with the limitations of the study in mind. First, the cross-sectional, correlational design does not allow conclusions about cause and effect between metacognitive strategies and self-efficacy. Second, the use of self-report questionnaires may be affected by social desirability and self-assessment bias. Third, because only female students were included, the results cannot be used to compare male and female students. Fourth, Flavell's metacognitive experiences and Bandura's environmental factors were not measured. Finally, the sample came from three HEIs in the Davao Region, which limits the extent to which the findings apply to other regions or settings. Future studies may therefore use longitudinal or experimental designs to test whether metacognitive strategy training leads to growth in writing self-efficacy, include male students for gender comparison, and examine possible mediators such as writing anxiety, peer feedback, and instructional scaffolding.

4. CONCLUSION

This study concludes that female health sciences undergraduates in the Davao Region have moderate levels of metacognitive writing strategies and English writing self-efficacy. The students know themselves as writers and understand what their writing tasks require, but they do not often plan, monitor, and evaluate their writing. The strong positive relationship between metacognitive writing strategies and English writing self-efficacy shows that students who use these strategies more often also feel more confident as writers. These findings support the parts of the two theories addressed in this study, namely Flavell's metacognitive knowledge and metacognitive strategies, and Bandura's personal and behavioural factors: what students do when they write (behaviour) is closely linked to what they believe about their writing ability (belief). Teaching metacognitive writing strategies in a clear and direct way, within gender-responsive health sciences programs, may therefore help female students become more confident and capable writers in English.

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