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Examining the Effectiveness of Metacognitive Writing Strategies for Improving Academic Writing Skills of Undergraduates

Arooma Ismail

Research Scholar at the Department of English, Shaheed Benazir Bhutto University, Sanghar Campus, Shaheed Benazirabad

aroomaismail59@gmail.com

Syedah Hafsa Wahida

Ph.D. English Scholar at the Center for Language Studies, Universiti Tun Hussein Onn Malaysia

wahidahafsa@gmail.com

Dr. Syed Hyder Raza Shah

Lecturer at the Department of English, Shaheed Benazir Bhutto University, Sanghar Campus, Shaheed Benazirabad

syedhyderraza_sng@sbbusba.edu.pk

Abstract

Developing academic writing skills is essential for undergraduate students, but many of them find it hard to organize and present their ideas effectively. Although metacognitive writing strategies have shown potential for improving self-directed learning, there is limited research on how they directly affect academic writing skills. It explores the use of metacognitive writing strategies as effective tools for enhancing the academic writing skills of undergraduate students. The study aims to examine how metacognitive writing strategies like planning, monitoring, and evaluation can help undergraduates improve their writing. This research used a quantitative analysis, in which a survey was conducted among 149 undergraduate students in order to determine the frequently used metacognitive strategies undertaken during the writing process, and a paired sample t-test was performed to test the significance of pre and post scores of the study; and it was found significantly improved the quality of student's writing after applying the metacognitive strategies. Analysis of the data was done using SPSS software. The results showed that students who applied metacognitive writing strategies made notable improvements in clarity, structure, and critical analysis in their writing process. The study highlights the importance of teachers incorporating metacognitive instruction into writing programs to support self-regulated learning and boost academic writing performance. Future studies should look into the long-term effects of these interventions in various academic fields.

Keywords: Academic, Writing Skills, Metacognitive Strategies, Undergraduate Students, Quantitative Study, Survey, Pre-Test, Post-Test.

Introduction

Students need to do more than study; they must additionally develop academic writing skills. These skills involve multiple abilities. Students do not need to understand the language used in writing; however, they also, the way to produce and organize their concepts effectively (Guo, 2022; Hancock & Karakok, 2021). Unfortunately, several students don't receive the required strategies to boost their academic writing skills at university. The most crucial skill for teachers, students, and researcher is academic writing, as a result of which it helps them communicate their concepts clearly through writing. Each writer has their own style. However, academic writing has specific needs that differ from creative writing (Dirigl & Noe,

2019; Keith et al., 2000). Therefore, universities need to teach academic writing skills properly using the correct method.

Currently, writing skills are primarily taught in language study programs at university. However, there are not several of those programs available. As a result, several students seek training outside of class to address the challenges of academic writing. Usually in language courses, instructors focus an excessive amount on synchronic linguistics and neglect different necessary language skills like speaking, listening, writing, and reading (Honey & Austin, 2021; Kim & Lallianca, 2018). In writing self- self-regulation is crucial for predicting a student's writing ability. Many students still struggle with metacognitive skills and self-regulation, which are essential for developing strong writing skills in an academic setting.

The possibility for instructing academic writing is to teach writing that concentrates on the processes and trends found in higher education (Cutri et al., 2021; Wale & Bogale, 2021). Such an instruction can serve as an alternative to the standard teaching of academic writing methods. Academic writing is a powerful skill for students that involves multifaceted thinking and strategies like planning, monitoring, and evaluation (Khojasteh et al., 2021; Saqr et al., 2021). Teachers will help students enhance and improve their academic writing by teaching them to use metacognitive strategies while they write in academic settings. However, students may encounter challenges while attempting to achieve their writing goals. The growth of a student's academic writing abilities depends on their understanding, planning, and setting writing goals, as well as reflecting on their writing outcomes to enhance their overall writing quality (Farahtan & Avaramani, 2018; Teng, 2022).

This study differs from earlier research because it explores metacognitive strategies within the context of academic writing, particularly at the university level. In addition, past studies haven't examined how these strategies communicate to different aspects of metacognition that also affect writing skills. Therefore, this research can help clarify how metacognitive strategies impact academic writing. It will offer insights into various academic writing methods. Furthermore, this research may shed light on how principles from academic psychological science, like self-regulation, will be transferred from the field of metacognition to boost Academic writing.

The study focuses on the teaching of academic writing skills. It highlights how understanding an individual's own thinking, known as Metacognition, plays a key role in enhancing writing quality. This research aimed to uncover the connection between metacognitive writing strategies and academic writing. To examine which strategy is more effective for improving writing skills.

Academic writing is a basic expertise for undergraduate students. However, it remains one of the foremost challenging aspects of higher education. This challenge is especially articulated in rural areas such as Sanghar, where students confront systemic boundaries to create solid academic writing skills. Factors such as restricted access to guidelines assets, undertrained educators, and a focus on repetition memorization ruin students' capacity to think and express thoughts effectively in their writing.

In this way, these students struggle with coherence, structure, and clarity in academic writing, which unfavorably impacts their academic performances and limits their future opportunities in higher education and capable spaces. The circumstance in Sanghar is exacerbated by the need for inventive educating procedures custom-made to the region's particular needs. Traditional teaching methods often center on the product instead of the writing process, leaving students with inadequate direction on how to approach writing tasks. This dearth of process-oriented instruction denies students the opportunity to develop essential skills, such as self-regulation, critical thinking, and reflective learning, which are crucial for convincing writing.

Metacognitive writing strategies, which combine planning, monitoring, and evaluating the writing process, have been generally recognized as effective tools for making effective

academic writing. These procedures energize students to reflect on their learning process, distinguish regions for improvement, and make necessary adjustments. Research has illustrated that metacognitive strategies can essentially improve students' academic writing skills and generally writing performances (Teng, 2021), but that, as it may be, the application of these strategies in rural settings like Sanghar remains underexplored.

These topics address this gap by looking at the effectiveness of metacognitive writing strategies in improving the academic writing skills of students in Sanghar. By understanding how these techniques affect students' writing quality and self-regulation, the study seeks to provide actionable experiences for teachers and policymakers to improve academic writing instruction in comparative settings.

The main aim of the study is to examine the effectiveness of Metacognitive writing Strategies for improving the Academic Writing Skills of undergraduates at Sanghar.

Research Question

1. Which metacognitive writing strategy is frequently used by undergraduate students while drafting academic texts?
2. Is there a relationship between metacognitive writing strategies and academic performance?

Literature Review

Writing is an extremely challenging cognitive activity that requires simultaneous focus on multiple levels, such as theme, paragraph structure, sentence formation, grammar, and vocabulary. It is globally acknowledged as a marker of skill (Buyukyavuz & Cakir, 2014). Writing must be clear, understandable, and easy to comprehend in other contexts. This ability goes beyond simply creating symbols, similar to how speaking is more than just producing sounds. Writing is both a process and an outcome, requiring creativity, focus, and perseverance (Dockrell, Connelly, Walter, & Critten, 2015). It is an important aspect of delivering thoughts through different writing style and tone, but before choosing the style and tone the writer must consider some strategies such as organizing thoughts into words, sentences, and paragraphs, monitor the content, and lastly evaluating the final writing script and checking the mistakes of writing which enhances the effectiveness of writing proficiency. Writing is seen as one of the productive language abilities that requires learners to generate the language they have acquired. Additionally, writing is regarded as a major language skill among the four fundamental skills, which include writing, reading, speaking, and listening (Ahmed & Rajab, 2015; Richards & Rodgers, 2014). As many academic institutes rely on written work and assignments, it is a core skill in academics, education, and research. Writing proficiency is the toughest output skill for a learner of English as a foreign language (EFL) to acquire. This skill is essential for evaluating students' capabilities. Insufficient writing abilities have been highlighted as key contributors to student failures in English language assessments, especially in scenarios where English is taught as a Second Language (ESL) or EFL (Yuan-bing, 2011). Despite this, writing is a complex process, but if the teachers instruct students and give them proper guidance, they can attempt it without any doubt. (Grabe & Kaplan 2014) Identify a practical issue: poor writing skills influence students' performance not just in English, but in virtually all academic subjects. Furthermore, writing is one of the four key English language skills that requires attention and should not be overlooked (Al-Khasawneh & Huwari, 2013; McCarthy & Carter, 2014). One major difficulty faced by individuals who are not native English speakers when creating high-quality written work is usually connected to insufficient practice with the language (Jahin & Idrees, 2012). Mohamed & Zouaoui (2014) state, writing needs a considerable amount of time and involves complex steps that allow learners to arrange their thoughts and express them clearly. It improves thinking and learning by promoting interaction and encouraging the contemplation of ideas.

For students, writing is a crucial skill. Especially for undergraduate students, this skill is indispensable to the success of their lives after university. As the ability to frame a coherent

argument is critical in higher education, students must know how to construct texts that are intelligent and well-organized. They are faced with the challenge of Academic Discourse (Zimmerman & Bandura, 2020). New approaches to the teaching of writing are needed if we're to help students meet these demands effectively. One promising pedagogical method deals directly with formulating metacognitive strategies that can be applied to all writing tasks. Embedded within the overall theory of metacognition, these strategies make learners conscious of their thinking and learning processes. Enhanced planning, monitoring, and evaluation of writing tasks then becomes possible (Flavell, 1979; Schraw & Dennison, 1994). Recent studies support that metacognitive instruction not only supports academic writing but also promotes greater learner autonomy and self-regulation (Teng & Zhang, 2020).

Metacognitive Writing Strategies

It is well known that academic writing skills depend on metacognition, that is, awareness and control of one's own thinking and learning processes. Its feature of planning, monitoring, and evaluating the writer's activities makes it suitable for students to plan, monitor, and evaluate their writing activities and therefore see their work enhanced. Metacognition is a multidimensional and general domain of ability. Metacognitive strategies were initially created from the theory of thought approach (Cutri et al., 2021; Khojasteh et al., 2021). Theory of mind is the basis for creating metacognitive strategies. Metacognitive strategies can compensate for missing abilities, utilizing the area of information and self-regulation, enabling people to enhance their cognitive skills (Gioia et al., 2023; Phillips, Galloway et al., 2020). Metacognition can be characterized as the ability to think, as well as the official forms that are utilized to optimize cognitive abilities as learners. Planning is one of the fundamental elements of metacognition that deals with the idea of setting goals before starting a writing task. It may involve determining the purpose of the text, who the target audience will be, speculating on the structure, and which sources will be used. In addition to monitoring, it is about making decisions regarding the importance of an idea and the extent of the supporting evidence. Finally, on evaluation, the evaluation is done upon the whole text, which determines whether it complies with the intended objectives and academic rules. This stage might also include proofreading, checking for clarity, and organizing well. The level of information held by people includes task information and methodology information. Task information is an individual's understanding of the nature and targets of the assignment, whereas key information incorporates the information on how to complete the task effectively.

Metacognitive information comprises a few sorts of information, including declarative information, procedural information, and conditional information. Components that allude to explanatory information are the person, mental, and information-processing capacities. Procedural information is the capacity of people to apply their information when utilizing the proper methodology. This information makes a difference to the person in using the procedure at the fitting time and in connection with the right task (Lamb et al., 2019; Roald et al., 2021). In particular, non-native speakers struggle with forming and meeting expectations regarding the grammar, vocabulary, and coherence of the academic writing they produce. These Metacognitive strategies aid these learners to be more conscious about how they use the language and what message they have to give. This way, they can learn to know their weaknesses and work out strategies to handle them. Metacognitive experience is the capacity to utilize already obtained information to prepare for newly received tasks or information. Metacognitive experience includes an evaluation, efforts, solution, difficult tasks, familiar tasks, and self-confidence (Hadianto et al., 2022; Yung & Cai, 2020). In other words, we students need to build our capacities regarding academic writing by using metacognitive strategies.

Metacognitive Strategies

This study is based on the assertion made by Flavell (1987), Hass (2010), and Morre (2014). Flavell's statement (1987), every person has their awareness of and regard for cognitive processes and tactics. According to Flavell (1987), the metacognitive method can help people acquire higher-order thinking skills. The concept of Metacognition was given by Flavell, which refers to an individual's awareness and control of their cognitive processes. In the context of writing, metacognitive strategies involve three key components: planning, monitoring, and evaluating.

Planning

Planning stands out as a unique approach in metacognitive processes aimed at enhancing writing skills. Viewing planning as a method boosts students' objectives and highlights how these goals can be effectively achieved (Danielson, 2011). As a result, students can engage in meaningful learning that utilizes relevant resources to improve their performance. Essentially, the planning process involves establishing goals, reviewing pertinent materials, evaluating questions, and analyzing tasks. This allows students to organize their learning and thoughts, creating an optimal environment for acquiring knowledge. Consequently, they can focus better on learning while developing applicable strategies that suit their needs (Suskie, 2018). In simpler terms, planning entails implementing strategic approaches to allocate resources effectively, select appropriate techniques, and manage resources correctly, all aimed at enhancing task outcomes. Steiner (2010) aptly notes that effective task completion requires forecasting before writing, ordering strategies, and managing time. Kellogg's (2008) research delves into differentiating between high-quality and low-quality writing. It reveals that experienced writers are typically more efficient in their planning, independent of the text's content, whereas less skilled writers struggle in this area.

Moreover, planning is essential for fostering students' self-assurance and commitment through effective planning practices, promoting a sense of responsibility towards their learning. Educators can assist students in defining their goals and formulating a viable plan. This process allows students to reflect on their needs and consider how to address them. It is crucial for teachers to clearly define goals to prevent students from becoming confused. The more concrete the goal, the greater the likelihood of student success. For example, learners in an EFL writing course may outline steps such as arranging ideas, drafting an outline, and determining the methods needed to create high-quality written work (Panahandeh & Asl, 2014). Addressing concerns related to planning strategies, the current study proposes brainstorming techniques. Brainstorming serves as an effective method, aiding learners in assessing whether they have too few ideas or an abundance. It enables them to organize their thoughts efficiently before starting to write. This entails quickly jotting down thoughts as they arise. Brainstorming focuses on generating ideas rather than assessing them (Fawzi & Hussein, 2013).

Monitoring

A comprehensive process of awareness and tracking related to accomplishing a task is called Monitoring. In academic research, it is associated with the ongoing development of students (Kazemi, Franke & Lampert, 2009). Monitoring is an essential part of metacognitive strategies, which gives direction during the writing process. Many existing studies discovered a strong relationship between metacognitive knowledge and the accuracy of monitoring. For example, Pearson (2014) found that adults' capability to assess how well they understood a writing after reading was tied to their monitoring accurateness during a subsequent comprehension test. In a similar vein, research conducted by Hoffman and Spataru (2008) focused on fifth and sixth-graders' skills in resolving computer issues. Involving three different groups, the findings indicated that the group that monitored their problem-solving approach tackled more complex tasks more quickly than the other groups.

It is essential for tracking learners' educational journeys. Through effective monitoring, teachers can identify students' knowledge challenges and find ways to address these

problems (Sun, 2013). Additionally, during the monitoring phase, students check in with either their teacher or themselves to report on their progress and recognize areas that might require adjustments or new strategies. This type of self-reflection during an activity is often called 'Reflection-in-Action.' Students have demonstrated that these exercises typically lead to significant reflection and learning opportunities, including keeping focused on goals, organizing processes and steps, recognizing achievements of sub-goals, understanding their performance, knowing when to move to the next step, identifying obstacles and errors, and learning how to overcome these challenges. Using the monitoring phase, students frequently seek confirmation from their teachers. They may ask questions related to their writing or express uncertainty about it. This inquiry helps them develop strategies for improving their writing. Conversely, they might also adjust their strategy based on this reflection, which creates additional learning chances (McMullen, 2009; Isaacson & Fujita, 2006).

Evaluating

Evaluation is the process of assessing how effective a particular strategy is in reaching the goals of an organization and making necessary adjustments when needed. Metacognitive strategies represent the concluding phase involved in the writing task. Important parts of evaluation involve examining the basis of a task plan, comparing real results to what was expected, and implementing lessons learned from the results. This approach guarantees that the organizational plan and its implementation correspond with the organization's aims. Evaluation matters as much as creating strategies because it shows the efficiency of the overall plans in reaching the intended conclusion. It is as essential as the previous strategies are, but evaluation polishes the final draft of writing. During the evaluation phase, students reflect on their completed work and consider the strategies, tools, resources, and processes they utilized. Schmitz, Kawahara-Baccus, and Johnson (2004) explained that reflection is considered transfer when it occurs during the activity, referred to as "reflection-on-action. Additionally, evaluation can be understood as a review of how well a policy has been implemented. Through evaluation, one can analyze and assess whether a policy or strategy aimed at fulfilling a goal aligns with people's expectations. While skilled writers employed a "knowledge-transforming" approach, weaker ones used a "knowledge-telling" method (Bereiter & Scardamalia, 2013). Furthermore, evaluation pertains to the final phase of reviewing and grading the results of a task and the strategies applied throughout the learning journey (Sun, 2013). Evaluation goes hand in hand with monitoring, in which teachers play a significant role. It improves writing proficiency and reliability as the teacher judges the overall writing task with in-depth analysis and sees the strong and weak points critically.

There are various crucial steps that students should take in this stage: assess how much they have met their goals; evaluate the precision and effectiveness of the outcomes, assess the suitability of the methods applied, and evaluate the results of the task along with the efficiency of its execution; this might involve reevaluating the strategies used. They should also consider how to tackle challenges and mistakes, and assess the effectiveness of the plans implemented.

Metacognition and Self-Regulation

Self-regulation in learning exists when someone exhibits metacognitive abilities or self-regulated learning (SRL). SRL combines individual behavioral and natural control methods for its practical use. Self-regulation is an individual's capacity to utilize cognitive and emotional techniques to manage uneasiness within the learning prepare (Henry & Austin, 2021; Kim & LaBianca, 2018). When performing self-regulation activities, individuals demonstrate adaptive capabilities in their usage of cognitive procedures.

Self-regulation involves developing multiple skills that align with specific assignment settings. Adults showing essential control over these three control facets demonstrate advanced metacognitive ability. The components of SRL, specifically individual forms, environment, and behavior, all offer assistance with understanding data, setting goals, utilizing procedures, and

evaluating and adjusting fitting methodologies so that students can ideally get it in the learning fabric (Alfaifi, 2022; Davies & Greenwood, 2020). Students with high levels of self-regulation develop multiple metacognitive methods that they use to direct their abilities and environment toward learning success. Learning receives support through the utilization of personal qualities and outside environmental factors. Students demonstrate self-regulation in learning when they deploy their capabilities to organize and direct, and control learning through purposeful thinking and emotional and behavioral control. The SRL technique is additionally accepted to be able to progress a person's cognitive, metacognitive, behavioral, and motivational direction (Corridor et al., 2018; Keith et al., 2020).

Metacognition in EFL writing

Metacognition stands as an essential framework that helps enhance writing proficiency in second and foreign language institutions (Teng, 2019). The teaching of English as a foreign language (EFL) now places greater emphasis on this concept, which exceeds educational psychology fundamentals. Learners studying English as a second or foreign language differ from native speakers due to researchers have identified the difficulty of attaining literacy skills alongside complex comprehension in a foreign language (Hedgcock, 2012). The research community shows rising interest in how metacognitive processing affects the writing skills achieved by EFL learners. Qin and Zhang (2019) analyzed the relationship between metacognitive strategy knowledge and writing abilities in EFL students. The research by Qin and Zhang analyzed writing skills among 126 EFL students from a Chinese university. The research data demonstrated that students who knew more metacognitive strategies performed better in their writing tasks. The researchers emphasized that language skills represent essential components for English as a second language students. Students who demonstrated stronger language abilities employed metacognitive strategies for planning and assessment, and monitoring more frequently than their peers who had weaker language abilities.

Bui and Kong (2019) looked into the effect of metacognitive training on peer evaluations among students learning a second language. Secondary school students in Hong Kong participated in a 12-week writing intervention course. Results affirmed that metacognitive training improved student engagement and teamwork. This training also fostered more opportunities for feedback related to content. A recent study by Teng and Huang (2021) looked at the writing development, complexity, accuracy, and fluency of 352 university EFL students. This involved a 16-week course that incorporated metacognitive training into cooperative writing activities. While no positive changes were found in writing complexity and fluency, there was a notable improvement in writing accuracy.

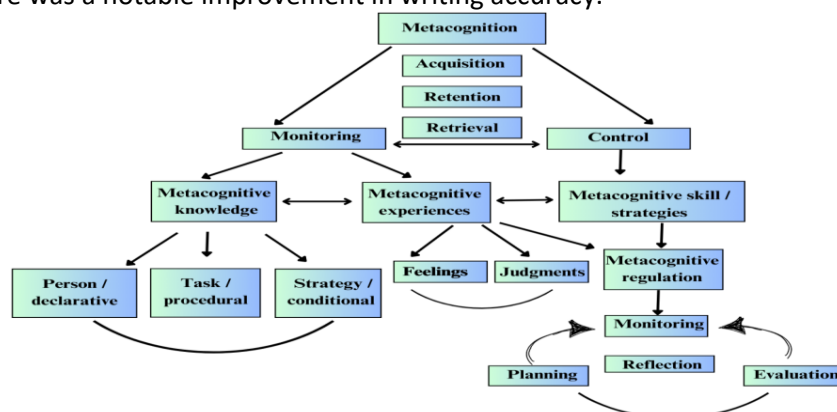


Fig.1 Multi-facted elements of metacognition (Teng et al.,2022b,p.171)

Empirical Evidence on Metacognitive Writing Strategies:

A study by Donker et al. (2019) found that students who received explicit instruction in metacognitive writing strategies demonstrated significant improvements in their writing

coherence and organization. The findings suggest that training students to plan, monitor, and evaluate their writing enhances their ability to produce well-structured academic texts.

Rahmat (2021) examined the role of metacognitive awareness in writing among ESL learners and found that higher metacognitive awareness correlated with better writing performance. Students who engaged in self-monitoring and self-regulation produced more coherent and well-organized essays.

Negretti (2020) explored the impact of metacognitive planning strategies on undergraduates' writing performance. The study found that students who engaged in detailed planning before writing produced more logically structured and argumentatively strong writing compared to those who did not plan.

Graham and Perin(2017) conducted a meta-analysis of writing instruction strategies and concluded that metacognitive evaluation significantly enhanced writing proficiency. The study emphasized that students who regularly revised their work based on self-assessment and feedback demonstrated substantial improvements in grammatical accuracy and content coherence.

Recent studies have employed various methodologies to assess the impact of metacognitive strategies on academic writing. For instance, Noor et al (2024) conducted an experimental study with seventh-grade students in Punjab, Pakistan, utilizing a pretest-posttest control group design to evaluate the effectiveness of metacognitive self-assessment strategies on writing skills. The findings indicate that students who received a metacognitive strategy achieved higher writing scores compared to the control group.

While numerous studies have validated the effectiveness of metacognitive writing strategies, there is limited research focusing on undergraduates in rural regions like Sanghar, Pakistan. Most studies have been conducted in Western or urban educational settings where students have greater access to academic resources and structured writing training (Rasheed et al,2020). The lack of context-specific studies presents a significant research gap, as cultural, linguistic, and educational factors in rural areas may influence the effectiveness of these strategies.

Methodology

In this research, a quantitative method was used to investigate how metacognitive writing strategies affect students' academic writing skills. The design incorporated two primary methods: 1. A descriptive survey component encompassed 149 participants to understand how students reported using metacognitive writing techniques within a wider context. This mixed methodology allowed for both causal relationships and generalizations through statistical methods. 2. A paired sample t-test was taken involving 30 undergraduate students, aimed to analyze the relationship between metacognitive writing strategies and students' academic writing performances.

A total of 149 students filled out a Questionnaire for identifying the most frequent used metacognitive writing strategies by the undergraduate students while writing academic texts.

A total of thirty undergraduate students from Shaheed Benazir Bhutto University, Sanghar Campus, took part in the Paired Sample t-Test. First, the students were involved in pre- pre-test in which they received instruction on traditional writing methods after this test, students received instruction on metacognitive writing strategies for 4-weeks. soon after this post- test was conducted on same students with metacognitive writing strategies.

The 149 students filled out a validated questionnaire, which was based on existing instruments measuring metacognitive writing strategies. This questionnaire evaluated planning, monitoring, and evaluation strategies.

Participants in the Paired Sample t-Test completed both a pre-test and a post-test writing task, which was evaluated with a rubric.

Survey responses were collected digitally and organized for analysis using SPSS. Scores from the pre-test and post-test writing assessments were gathered and rated by paired test assessment.

The analysis of data was carried out using SPSS, which stands for Statistical Package for the Social Sciences:

- To evaluate the writing scores after the paired sample t-test was conducted, comparing the pre and post test (n = 30).
- For the survey data (n = 149), descriptive statistics such as mean, standard deviation, and frequency were used to find trends in the use of metacognitive strategies.
- Reliability testing (Cronbach's alpha) confirmed the questionnaire's internal consistency.

All statistical analyses were executed at the 0.05 significance level.

Findings

The purpose of this study was to investigate undergraduate student's practice of metacognitive writing strategies when writing academic writing and determine whether or not these strategies and academic writing are related. Descriptive statistics were used from a sample of 149 undergraduates through survey and paired sample t-tests were used to analyse the data from 30 undergraduate students.

Q1. Which metacognitive writing strategy is frequently used by the undergraduate students while drafting academic text?

Table 4.1: Mean, Minimum, and Maximum of Metacognitive Writing Strategies

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Planning	149	9.00	35.00	25.5638	3.94955
Monitoring	149	13.00	40.00	29.7785	4.56314
Evaluation	149	7.00	25.00	19.1946	3.25427
Valid (listwise)	N 149				

The above descriptive statistics table 4.1 shows the mean score from top to bottom, which clearly identifies the frequently used metacognitive writing strategy.

The following charts representing the descriptive statistics for the three metacognitive strategies, Planning, Monitoring, and Evaluation, bear some trends in how participants use these metacognitive strategies.

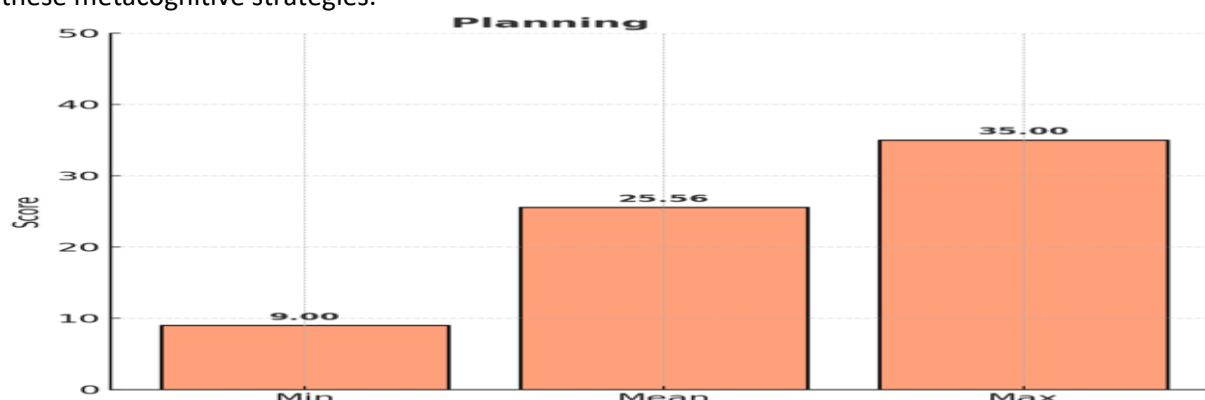


Figure 1.1 Mean, Minimum, and Maximum of Planning

Figure 1.1 indicates that planning has a mean of 25.56 with a range of 25.56 9.00 to 35.00. The relatively high mean suggests that most of the participants have a strategy to help them in their planning during their academic writing tasks. Though, because of the wide range, we see variation between how consistently students use these strategies. There are varying degrees of this, and it may be accounted for through differences in awareness, training, or academic preparation.

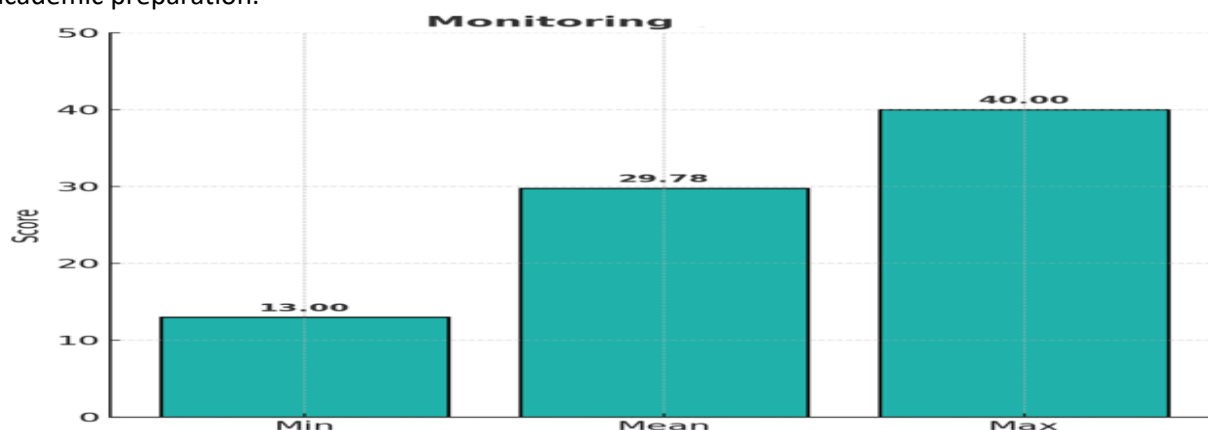


Figure1.2 Mean, Minimum and Maximum of Monitoring

Figure 1.2 shows one of the among three strategies, monitoring has the highest mean score of 29.78, with the value ranging from 13.00 to 40.00. That is, it implies that participants are tracking their writing progress more frequently, and more actively, and taking appropriate action based on their tracking. Since the average is elevated, their metacognitive behavior is centered around monitoring, perhaps because monitoring is more apparent and more immediately beneficial during writing.

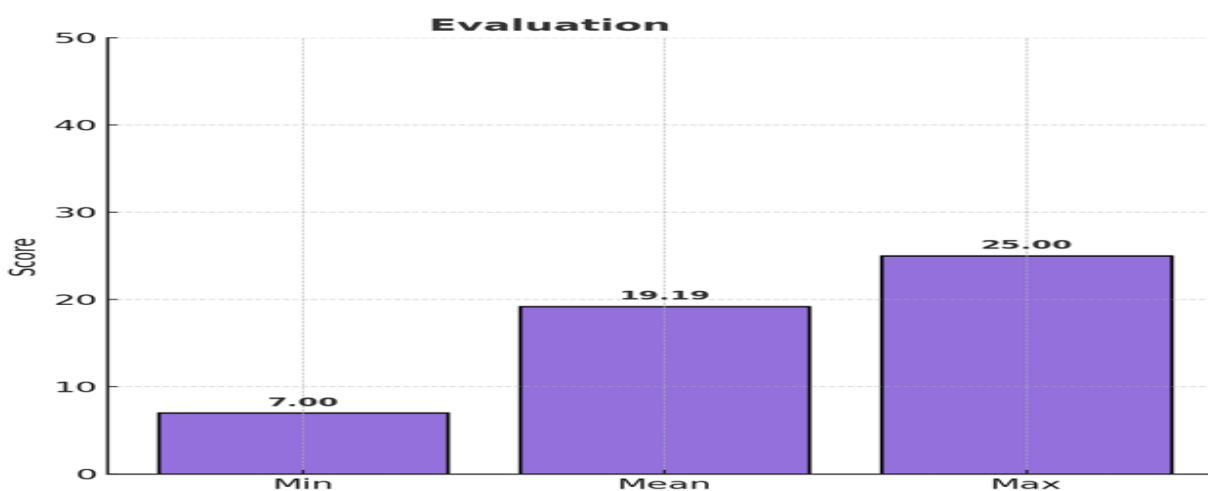


Figure 1.3 Mean, Minimum, and Maximum of Evaluation

Figure 1.3 strategy with minimum evaluation is the lowest, which is the evaluation with a mean score of 19.19. The minimum and maximum values for its values are 7.00 and 25.00, respectively. All of these points point to a possible area where students are not confident or even prepared to critically review and critique their writing. Having scored a lower mean suggests that evaluation may not be as developed among many learners, perhaps because they were not directly instructed or given feedback on this particular strategy.

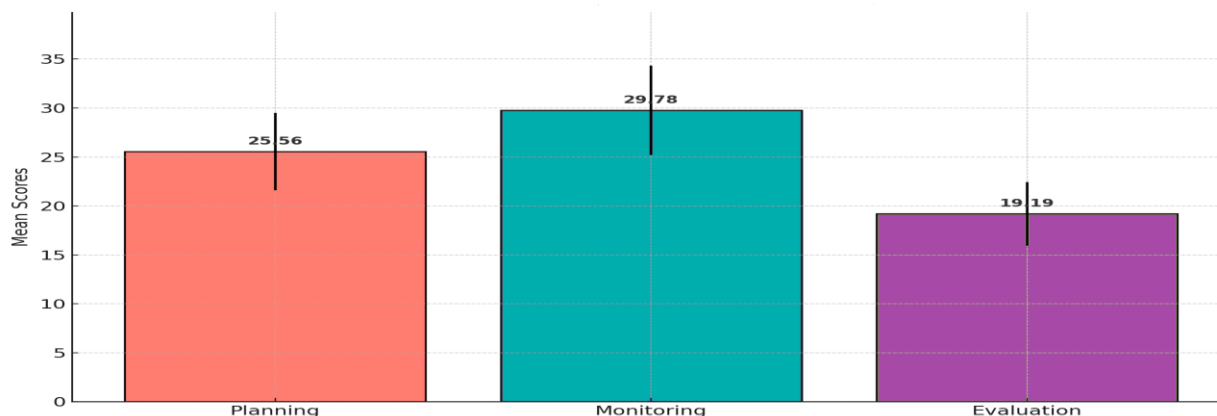


Figure 1.4 Overall Mean Score of metacognitive writing strategies

Figure 1.4 presents the difference in mean values, highlighting that Monitoring is the strongest strategy with a mean score of 29.78 in students' metacognitive strategies, while Evaluation is the weakest with a mean score of 19.19.

Q2. Is there a relationship between metacognitive writing strategies and academic performance?

To find out if using metacognitive writing strategies affected academic writing skills, a paired sample t-test was used. Participants gave pre- pre-test and after this, metacognitive writing strategies were implemented on students and taken post- post-test after the intervention.

Table 4.2: Paired Sample Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PreTest	54.2333	30	3.55919	.64982
	Posttest	71.1000	30	4.13021	.75407

Analysis of the results from the pre- and post-test showed a significant improvement in the participants' performance after the intervention. Students on average scored 54.23 on the pre-test, which in the end rose up to 71.10 post-test. This represents a marked increase of almost 17 points, showing that the teaching strategy or activity applied between the two assessments produced a positive result for learners.

Standard deviation for the pre-test was 3.56 and for the post-test 4.13, which shows that, although students improved overall, the range of scores was slightly larger in the post-test. Although the mean score is increasing overall, the same pattern of progress applies throughout the group.

The results show not only that the students performed better after the intervention, but also that the approach probably allowed most students to do better when compared in the tested area.

Table 4.3: Paired Sample t-Test

		Paired Differences						t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
					Lower	Upper				
	Pair1									
	Pre Test									
	Post Test									

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The research employed a paired samples t-test between PreTest and PostTest participant scores to evaluate significant score differences between conditions. The analysis showed participants scored 16.87 points higher on average in their PostTest than their PreTest responses (SD = 2.01).

The calculated 95% confidence interval, with -17.62 to -16.12 for mean difference, excludes zero and strengthens evidence of significant statistical effects. The calculated t-value of -45.90 with 29 degrees of freedom produced a p-value less than .001 ($p = .000$). The data provide strong statistical proof against the null hypothesis with an alpha value at 0.05. Results indicate participants made a notable performance improvement from the starting PreTest until the subsequent PostTest. Learners achieved substantial improvements in their outcomes because of the educational intervention that ran between the two assessment points.

Discussion

Most Influential are the charts visualization of the descriptive statistics for the usage of Planning, Monitoring, and Evaluation strategies in academic writing, presenting a different use pattern by learners.

For Planning, the mean score is 25.56 with a range of 9.00 to 35.00. While many students do planning strategies, the degree to which they do so varies. Research shows that planning is important in writing proficiency. Similarly, Razzaq and Hamzah (2024) concluded that planning aids in improving writing effectiveness among Pakistani ESL learners in terms of encouraging them to write. However, Lim et al. (2023) warn that prompts to plan do not necessarily lead to better writing quality unless these are coupled with explicit teaching of planning skills.

The highest mean score of 29.78 is exhibited by monitoring, with a range of 13.00 to 40.00. In other words, students are participating in the oversight of their writing processes. Al-Othman (2024) showed that feedback tools can automatically enhance student self-regulatory writing strategies, such as monitoring, resulting in better writing performance. This implies that technology does improve students' capacity for monitoring.

Results are evaluated, and the lowest mean score is 19.19, ranging from 7.00 to 25.00. This suggests that there may be a gap in students' skills to critique their writing. Riwayatningsih et al (2024) found that although evaluation strategies contribute to better writing clarity, they are used less often by the students. The underutilization could be due to a lack of awareness or instruction in evaluative techniques.

The paired samples t-test results demonstrate a marked enhancement in students' writing skills after the adoption of metacognitive writing approaches. The intervention successfully improved students' writing skills, as evidenced by the rise in the average score from 54.23 in the pre-test to 71.10 in the posttest.

This result is consistent with recent studies that highlight the beneficial effects of metacognitive techniques on writing ability. For example, Razzaq and Hamzah (2024) discovered that using metacognitive planning techniques greatly enhanced the writing ability of Pakistani ESL students by making them more receptive to writing. In a similar vein, Liu (2022) found that using metacognitive techniques in flipped classroom instruction improved EFL students' writing abilities, including content and structure.

Additionally, it has been demonstrated that employing metacognitive self-evaluation techniques is beneficial in improving one's writing abilities. Highlighting the significance of

self-regulation in the development of writing skills, Noor et al (2024) showed that students who used self-assessment techniques earned better writing marks than those who did not.

The results of these studies, taken together, highlight the effectiveness of metacognitive methods in enhancing writing proficiency, which corroborates the findings of the present investigation.

Conclusion

Finally, this study affirms the necessary contribution of metacognitive writing strategies to students' other academic writing skills. The analysis indicated that the application of strategies, such as planning, self-monitoring, and self-evaluation, affects the improvement of students' writing performance shown by the results of the pre-test and post-test. A strong positive correlation is found between the frequency of strategy use and better writing skills, suggesting the increased importance of including metacognitive awareness in writing instruction.

These results are used to conclude that metacognitive strategies help to make students more reflective and metacognitive writers. Thus, introducing such strategies into the academic writing curriculum may enable students to acquire critical thinking skills, organize and edit writing work, and achieve better academic writing outcomes. The result of this study suggests that metacognitive approaches should be integrated into writing pedagogy and that the effectiveness of these approaches should be investigated more broadly for use with other writing tasks and in different academic disciplines.

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