ELWAHAT Journal for Research and Studies
https://www.asjp.cerist.dz/en/PresentationRevue/2Available online at :

ISSN : 1112-7163 E-ISSN: 2588-1892 Volume(17)/Issue (1) (2024):808-827

Effects of Cognitive and Metacognitive Regulation on Students'Academic Writing Performance at Badji Mokhtar-Annaba University

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Received: 25-11-2023 Accepted: 20-01-2024 Published: 06-06-2024

Abstract:
Academic writing involves both linguistic and self-regulatory skills, namely cognitive strategies that students need to deploy in performance. This study investigates the type of relationship(s) existing between cognitive/metacognitive self-regulatory strategy use on the one hand and academic writing performance on the other hand. The study sample is Master 1 students (N=82) of Language Sciences at Badji Mokhtar University of Annaba. Data tools consist of a self-report questionnaire in addition to an index of performance based on exam scores (2022/2023). Data were analysed by means of a correlational analysis, using T-test and simple linear regression. Findings revealed a moderate positive association (R2= 0.514) between the study variables with an effect of (b=0.420). Participants' use of cognitive strategies was found to affect performance by 51.4 %. Recommendations were provided to hone students' writing performance within a self-regulatory perspective.

Keywords: Academic writing performance,Self-regulatory skills,Cognitive and metacognitive strategies , Masters 1 students of English , Correlation

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1. Introduction

In the context of English as a Foreign Language (EFL), academic writing serves not only as the main evaluation tool to assess students' literacy competence, but also to test content knowledge across curriculum subjects. Therefore,'students entering higher education are expected to develop into proficient academic writers in the course of their studies' (Ofte, 2014, p.1). Many EFL students, however, tend to struggle with the demands of this productive skill, which interferes with their academic achievement. Writing combines both individual abilities and performance stages, which oftentimes seem to be overlooked by EFL students and may lead to poor writing performance.

Based on a personal teaching experience in EFL writing, it has been noted that students tend to be more focused on the final written output, without giving due importance to the inherent process to achieve it. Besides, given the realities of the overcrowded EFL classrooms and the insufficient sessions devoted to Written Expression module, it makes it difficult for instructors to ensure regular follow-ups that effectively remedy their students' performance. Consequently, classroom assignments are most of the time treated selectively and students are left with the responsibility for mending and improving their own writing skill for an optimal performance.

Within this perspective, the self-regulatory (SR) approach to learning constitutes prolific grounds for enhancing writing by tackling it as a dynamic process (Zimmerman et al., 1996) that emphasizes the active participation of learners by drawing on their own resources to 'become responsible for negotiating outcomes, approaches and strategies for achieving outcomes' (Harding et al., 2018, p.6). Empirical findings have indicated a positive relationship relating SR strategy use and academic attainment (Pintrich & De Groot, 1990 ; Zimmerman & Martinez-Pons, 1990, as cited in Ho, 2003), and further supported the relevance of SR strategies in writing by revealing their effectiveness in improving students' writing abilities and outcomes (Cer, 2019; Helsel & Greenberg, 2007; Kartika, 2015; Roderick, 2019; Zimmerman & Risemberg, 1997 ; as cited in Sari et al., 2023).

In this perspective, the present study aims to delve into the relationship existing between SR cognitive strategy use and academic writing performance by investigating the case of Master 1 students in the EFL writing classroom in Language Sciences at Badji Mokhtar – Annaba University.

2. Writing Performance

As a core literacy skill, writing proves to be tightly linked to one's ability to produce text as a result of the interaction of various processes (Kellog & Raulerson, 2007). For Nunan (2003, p.88), writing is 'the process of thinking to invent ideas, thinking about how to express into good writing, and arranging the ideas into statement and paragraph clearly' (as cited in Basonggo et al., 2016). Contrasting with the 'traditional product-based view' that is limited to a one-way 'linear process of plan-write-edit'(Galbrait, 2009, p.8), this view foregrounds the dynamic, goal-directed activities that are required to initiate performance and grounded in a rich knowledge of writing stages and strategies to achieve optimal performance (Harris & Graham, 2016 ; Danoff, 1993).

On the one hand, writing performance refers to the ability to produce written language through physical and mental activities for the purpose of communication (as cited in Aini & Mufdi, 2021). In Brown's words, it represents 'the overtly observable and concrete manifestation or realization of competence' (2000, p.30). Thus, effective performance requires a set of subskills - generating ideas, categorising notes, drafting and revising the text (Zimmerman et al.,1996) - that address the different stages of the process. The latter encompass: (a) Planning, including setting goals, generating ideas, and organising the overall product; (b) translating the plans into text by converting the conceptual content into a linguistic form; and (c) reviewing the output for more refinement through reading and editing (Hayes & Flower,1980; 1986, as cited in Galbrait, 2009). These recursive cognitive phases need a degree of coordination and monitoring on the part of the writer and make part of the metacognitive control of the writing processes which, in turn, aims to ensure optimal performance (Graham & Harris, 2000; Zimmerman & Risemberg, 1997, as cited in Kellog & Raulerson, 2007). Accordingly, writing performance serves as an indication of one's ability to master the language and allow the writer's competence to be observed as an overt output. In this regard, writing strategies, which cover processes or techniques that are operable at different levels of performance (Robitaille & Connelly, 2007), prove to be crucial in optimising writer's composition.

On the other hand, writing performance can be framed in terms of

an elaborated distinction between two models of writing: the knowledge-telling and the knowledge-transforming models (Bereiter & Scarmadalia, 1987). While the former depicts the process as the acts of retrieving content from memory and organising it by associative relationship, the latter frames writing as a problem-solving task that requires a tailored design. The two models highlight different approaches to writing performance thal distinguish between proficient and the less proficient writers by pointing to the change in the role of the writer who is said to resort to different strategy patterns in performance. Adopting knowledge-telling strategies typically involves: (a) relying on memorisation and direct retrieval of content which is organised by associative relationships; (b) setting concrete goals and generating content relevant to the specific assignment; and (c) considering whether the text is appropriately expressed. By contrast, the skillful writers are said to resort to the higher-level knowledge-transforming activities that involve: (a) constructing more elaborate goals and plans before writing, and using them to guide performance; (b) continuing to develop and refine both their goals and the content during performance; and (c) revising the drafts more extensively by evaluating them against the specific goals. As a result, the proficient or 'mature' writers are described as 'more effectively adapted to their academic goals than the unskilled writers'(Kellog & Raulerson, 2007, p. 237).

Overall, the process approach to writing proves to be particularly helpful for EFL students as it enables them to be more aware of the phases and strategies that contribute in optimising their performance (Sari, 2023 ; Ofte, 2014 ; Galbrait, 2009; Danoff, 1993). Research on FL writing has helped to uncover these crucial areas of effective writing through focusing on the specific processes involved in text composition, namely text production processes. (Galbrait, 2009).

3. Self-regulated Learning

As an academic model, self-regulated learning (SRL) promotes strategic learning by drawing on learner's cognitive, motivational, and behavioral resources to achieve learning objectives. This approach enables the learner to 'initiate, control and regulate their learning performance on any given task' (Wolters et al., 2003). Pintrich (2000) characterised the different conceptualisations of SRL as a dynamic, 'constructive process' that endows learners with a potential control

over their tasks by virtue of the goals they set to themselves. Thereby, academic performance is viewed as 'a goal-driven process in which the learner monitors and regulates internal abilities and responses to negotiate external environments' (Alvi & Gillies, 2020, p.1)

For the purpose of this study, we describe academic learning in terms of cyclical phases, combining social and physical environments as framed within Bandura's Social Cognitive theory of learning (Harding et al., 2018, p.6). According to Zimmerman and Campillo (2003), the SR cycle involves three stages that can be enacted simultaneously. In the Forethought or Planning phase, the learner initiates learning by setting goals and activating their own perceptions and knowledge about: Self, Task and Context (STC). Subsequently, Performance phase, which is the focus of our study, involves the key activities of monitoring and regulating learners'cognition, motivation and behaviour, based on their metacognitive awareness of STC. The last stage of Reflection or Self-evaluation includes learners' reactions and reflections on performance outcomes. The latter serves as a feedback for planning subsequent actions, and thus justifies the cyclical nature of the model.

Throughout the SR cycle, the learner needs to activate an array of strategies that warrant effective performance. Basically, the cognitive SR strategies underlie learner's 'active engagement in the task and contribute to optimal performance' (Pintrich & De Groot, 1990, p. 34), such as resorting to memorisation and imagery to encode or visualise learning material, or to deeper elaboration and organisation activities, such as outlining and paraphrasing material. Falling under the same realm, the metacognitive strategies (MC) enable learners to control and regulate their cognition by questioning their decisions and choice of strategies that best fit the task requirements (Wolters et al., 2003). Both types of strategies prove crucial in effective academic writing, as they allow learners to'reflect on their work through monitoring, planning, and evaluating the outcomes of a literacy task'. (Joordan & Moonsamy 2015, p.100).

In the same vein, Harding et al. (2019, p. 78) asserted that **'**students who are able to regulate their own learning display high-order SRL behaviours, while those who are not regulating their behaviour display low-order SRL behaviours'. In this light, with a particular focus on performance, a proficient SR learner can be portrayed as an independent, active actor who deploys SR skills by focusing on goal-

directed activities and selecting appropriate strategies to plan and guide their learning in an SR cycle. This type of learners is also able to monitor their progress by seeking feedback in view of adjusting their performance and achieving their goals. They further engage, upon the completion of the task, in reflecting on their learning experience in order to use the resulting feedback to set new goals to pursue in subsequent learning tasks.

4. SR Strategies and Writing Performance

The intricate nature of academic writing requires students to develop not only the required linguistic skills but also an extensive range of SR skills. According to Graham and Harris (2016, p. 78), while difficulties in writing generally stem from 'a failure to implement appropriate strategies', effective performance can be achieved by developing 'understandings about the writing process, genre knowledge, and strategies for writing and self-regulating the writing process'. In this sense, a large body of empirical works has widely supported the relevance of SR in learning performance in general, revealing that students who display effective SR strategies are able to perform better on academic tasks than students who do not (e.g. Kitsantas, et al., 2008 ; Briley, Thomson & Iran-Nedjad, 2009 ; Magno, 2009 ; Dignath, Buettner, and Langfeldt, 2008, as cited in Magno and Cayado, 2018).

Prior research has also revealed the significant effect of SR strategies, namely cognitive and metacognitive, in enhancing students' writing performance and achievement (Cer, 2019 ; Helsel & Greenberg, 2007; Kartika, 2015; Roderick, 2019 ; Zimmerman & Bandura, 1994). Furthermore, descriptive research in the field supports the existence of 'a positive correlation between strategy use and writing competence' (e.g., Bai, 2014 ; Chien, 2012, as cited in Bai, 2015). Zimmerman further explains (2008, p. 166) that these 'self-directive processes enable learners to transform their mental abilities, such as verbal aptitude, into an academic performance skill, such as writing'. This can be achieved by mastering specific 'academic skills, such as setting goals, selecting and deploying strategies, and self-monitoring one's effectiveness'. Basically, the writing compositions 'appear to require the self-regulation of planning, text generation, and reviewing through metacognitive control of these processes' (Kellog & Raulerson, 2007, p.238; Graham & Harris, 2009 ; Zimmerman & Risemberg, 1997). This

was also acknowledged by Sari et al. (2023, p. 806) who maintained that 'SRL strategies are effective because they involve self-planning, self-monitoring, and self-regulation, which fit the nature of writing as a process, covering three phases'.

Similarly, experimental designs reveal notable effects that SRL has on language learning and performance, specifically on reading comprehension and writing which commonly serve as the dependent variables in educational research (Magno & Cayado, 2018). For example, Bai's (2015) findings about SR classroom intervention indicate that participants' effective strategy use had a significant effect on their achievement and more importantly on their writing competence, as in generating text, handling feedback, and revising. Sari et al. (2023, p.809) reported a plethora of studies conducted at all levels of education that highlight the effectiveness of SR strategy use in improving students' writing performance. For example, one study conducted by Hughes et al. (2019) emphasized the importance of employing appropriate metacognitive strategies throughout the writing process, including setting goals as a preparation in the prewriting stage; self-monitoring composition during performance; and finally, resorting to self-evaluation in order to reflect on the outcomes in the post-writing stage. In addition to that, the study of Cer (2019) pointed out to the benefits of adopting SR approach in writing and the ways it hones students' linguistic and cognitive abilities**.** In his study at the university level, Kartika (2015) reported a significant increase in students' writing scores after using SR writing strategies.

5. Methods and Materials

This study aims to measure the degree of students' use of SR strategies for the purpose of regulating their cognition/metacognition in academic writing performance. It seeks to examine the nature of the association between the two variables of SR cognitive strategy use and writing performance by means of correlational research.

The population of the study is Master 1 students (N= 82) of Language Sciences at the Department of Letters and English Language at Badji Mokhtar-Annaba University. Their age range is mainly around 21- 22 years old for 48 participants (58.6%). There was a substantial gender bias with 62 female participants (75.6%) while the percentage of males reached (24.4%), which is equivalent to 20 participants.

Data were collected during the first semester of the academic year

2022-2023, where participants were asked to report their actual writing patterns during a regular Written Expression session. This module represents a fundamental unit that is taught from the first year License to Master 1 level, where students are expected to develop adequate academic writing proficiency.

In order to unveil M1 students' use of academic SR strategies in writing performance, the following question is put forward:

- How does students' SR cognitive/metacognitive strategy use relate to academic writing performance ?

Following this thread, it is hypothesized that students' reported SR cognitive/metacognitive strategies reflect their levels of writing performance, specifying that:

H0. Students' use of SR cognitive/metacognitive strategies does not enhance academic writing performance.

H1. Students' use of SR cognitive/metacognitive strategies enhances academic writing performance.

In light of the above-stated question and hypotheses, we define the independent variable in this study as SR cognitive and metacognitive strategies that serve as predictors of the dependent variable, namely participants'academic writing performance.

The study aims to test the hypotheses by analyzing and interpreting the nature of associations that emerge from the intersection of the study variables, namely the self-regulatory cognitive/metacognitive strategies and academic writing performance. It sheds light on:

1. The extent M1 students use self-regulatory cognitive/metacognitive strategies in academic writing.

2. The degree SR cognitive/metacognitive patterns relate to students' levels of performance in academic writing.

5.1. Internal Structure of the Research Instruments

Data sources are participants' self-reports along with their exam marks in the module of Written Expression. The self-report questionnaire was analysed using descriptive and correlational statistics while participants' performance measure was mainly an adapted version of writing scoring rubrics.

5.1.1. Index of Performance

The first research intrument used in this study is an index of

performance that is designed to determine participants' levels of performance in academic essay writing, as part of a regular end-of-term evaluation during the academic year 2022-2023. Essays represent the most common measure of academic writing, helping to uncover the strengths and weaknesses of students in writing, and which may infringe on their performance and achievement scores (Trimmer 2004, as cited in Basonggo, 2016). In essay writing, students are more likely to exert substantial effort and skill to carry out their tasks appropriately. They tend to carefully consider the strategies that they believe help them effectively elaborate and organize their performance to reach their goals, such as note taking, paraphrasing, and asking questions (Sari et al., 2023).

Accordingly, participants' midterm examination marks in the module of Written Expression served as an index of performance. The latter was established on the basis of teacher assigned scores on a 20-point scoring scale. A distinction in writing levels was set between high performing students whose scores ranged above 10 point grade [10 – 20], and low performers whose scores were inferior to 10 [0 – 09.50]. The criteria selected for evaluating students' performance in essay writing were developed from band score descriptions provided in the International English Language Testing System (IELTS ; as cited in Donald & Kneale, 2001), in combination with O'Toole's scoring protocol (2010, as cited in Maher, 2011). The writing compositions obtained from the examination were assessed and scored by taking into consideration the major components of writing performance, viz. (a) Structure and organisation of the essay; (b) Mechanics of writing; (c) theme development related to content ; and (d) use of vocabulary.

5.1.2. Self-report Questionnaire

Following the quantitative approach, the present study adopts the self-report survey as an adequate tool for the examination of participants' SR strategy use in academic writing. The report is an adapted version of the Motivated Strategies for Learning Questionnaire (MSLQ) devised by Pintrich and De Groot (1991) and further elaborated by Wolters et al. (2003). In our case, the questionnaire addressed to the study sample of M1 students includes items that were tailored and operationalised to suit the specific purpose of the study. It invites the participants to reflect on and report their typical ways of engaging into cognitive SR processes during their writing performance.

These processes encompass the activities of setting specific goals, selecting effective strategies to reach these goals, and monitoring performance. This was carried out with the aim of unveiling features of writing practices that are commonly considered in SR research as predictors of performance. (Magno & Cayado, 2017)

The self-report consists of two parts: The first part covers general data related to demographics of the research sample, including age and gender. The second part examines the control and regulation strategies inherent in the performance phase, which is the focus of this study. For this purpose, The study tool was limited to performance scale as selected from the original three phase scales that cover the two other stages of planning and reflection (Pintrich & De Groot,1991 ; Wolters et al.,2003). It was adapted to examine 23 items that relate to two main areas involved in regulating writing performance, which include respectively:

(a) Strategies for the Regulation of Academic Cognition scale comprises 15 items and consists of two subscales: **(1) Elaboration** (items S1 through S4) and **(2) organisation strategies** (items S5 through S15) that are used in: *drafting* and organizing ideas (such as mapping, illustrating, or outlining); *revising* the writing style and editing for mechanical errors; *postwriting* such as understanding and learning from mistakes for better future performance. The second **(b)Strategies for the Regulation of Academic Metacognition scale** (items S16 through o S23) includes items about *mastery strategies,* lying in setting personal goals for learning, vs. *instrumental strategies(S21, S22)***,** limited to completing the assigned tasks. Item (S23) relates to self-editing as a form of Self-evaluation, as in resorting, for instance, to a revision checklist.

The participants were asked to indicate the extent to which they agreed with the statements by relating them to their actual use of SR strategies during their writing perfomance. This was carried out by means of a four-point Likert scale where responses ranged from *never* (1), *rarely* (2), *most of the time* (3), to *all of the time* (4). After collecting participants' responses, the sample data was treated and tabulated to examine the relationship between the study variables. For the purpose of analyzing the sample data, the Statistical Package for Social Sciences (SPSS V.26) was used.

6. Discussion and Analysis of Results

Data analyses of the association between SRL subscales and writing performance were carried out by means of general descriptive statistics and correlation analyses. The SPSS software (SPSS V.26) yielded the following results.

6.1. Strategies for the Regulation of Academic Cognition.

The participants' responses in this axis were moderate and their importance was estimated at 60%, as the average of their opinions (M= 3.04) falls within the third category. The direction of response is average (SD= 0.77), which indicates that the participants' answered positively and agreed to a moderate degree to all the statements.

Question validity test

We used the T test (One Sample Test) and the results were as follows:

Table 1

Results of the cognitive strategy question test

T test	Average difference	SIG	DF	MEAN	SD	test result
67.316	46.32927	0.000	81	46.3293	6.23224	Acceptable

Note. Prepared by the researcher based on SPSS V26 output.

As depicted in the above table, data analysis indicates that the calculated T amounted to **67.316**, which is greater than the tabular T, with the arithmetic mean at **46.3293** and the standard deviation **6.23224**. We also note that the significance level of **.000** is less than its value (0.05). Following the rule about the decision whether to confirm the hypothesis if the significance value is less than (0.05) and the calculated T value is greater than the tabular T value, or reject it if the significance value is greater than (0.05) and the calculated T value is less than the tabular T value. Therefore, we accept the hypothesis that answers the question about Strategies for the regulation of Academic Cognition.

6.2. Strategies for the Regulation of Metacognition.

We used the T test (One Sample Test) and the results were as follows:

Table 2

Results of the metacognitive strategy question test

T test	Average difference	SIG	DF	MEAN	SD	test result
62.346	22.98780	0.000	82	22.9878	3.33886	Acceptable

Note. Prepared by the researcher based on SPSS V26 software.

Results in Table 3. show that the calculated T amounted to **62.346** which is greater than the tabular T, with the arithmetic mean being **22.9878** and standard deviation **3.33886** . Besides, the significance level of .000 is less than its value (0.05), and based on the decision determined by the significance value and the calculated T value, we accept the hypothesis that answers the question related to Strategies for the Regulation of Metacognition.

6.3. Hypothesis Testing

In order to test the validity of the research hypotheses, the statistical methods of correlation were used, as a first step, to discover the strength and type of relationship between SR and students' academic writing performance. As a second step, regression coefficient was calculated to find out the effect of the independent variable (SR Cognitive strategy use) on the dependent one (writing performance).

The first hypothesis states that

H0. Students' use of SR cognitive/metacognitive strategies does not enhance academic writing.

H1. Students' use of SR cognitive/metacognitive strategies enhances academic writing performance.

To test the validity of this hypothesis, the correlation methods were used to unveil the strength and type of relationship between Cognition and writing performance, followed by regression analysis to find out the effect of the independent variable on the dependent one.

Table 3

Results of the simple linear regression analysis

Results of analyzing the relationship between cognition and writing performance					
Cognition	Pearson correlation coefficient (R)			**0.620**	
	Intangible probability value SIG			**0.000**	
Results of simple regression analysis to measure the effect of cognition and writing performance					
coefficient of determination (R^2) **0.514**			estimate of standard error **0.72477**		
Value (F) 18.168					
SIG 0.000					
Variable	B	ESD	Beta	T	SIG
Constant	11. 606	0.200		12.005	0.000
Cognition	0.519	0.017	0.420	8.081	0.000

Note. Prepared by the researcher based on SPSS V26 software.

The analysis results of the correlation between Cognitive strategy use and writing performance show that the correlation coefficient is R =0.620, which is a statistically significant value since the value of the significance probability is 0.000 less than 0.05. We note that there is a moderate direct correlation between the two variables.

Based on the results of the simple regression analysis, measuring the effect of Cognition and written performance, the coefficient of determination (R2) is estimated at **0.514**, which indicates a medium quality of reconciliation. About **51.4%** of the changes in the dependent variable are due to the independent variable of Cognitive strategy use, while the rest (**48.6%)** is due to other factors.

As for the value of variance (F), it amounted to **18.168**, as the tabular value of F is smaller than the calculated one, and it is statistically significant and estimated at 0.000, which is less than the significant level $\propto = 0.05$. The table also shows the value of the slope parameter b, which reached **0.420**, pointing out to the existence of an effect between the two variables. Therefore, any increase in cognitive strategy use by one degree corresponds to an increase in written performance by **0.420**. It indicates that the slope parameter is significant. As for the intersection parameter (fixed limit), it reached **11.606** below the significance level of 0.000, which is less than 0.05,

revealing significance. Therefore, the resulting statistical significance in the two regression parameters indicates that there is an effect between the two variables.

The foregoing reveals that the use of cognitive strategies has a statistically significant effect on particpants' written performance at a significant level $\propto = 0.00$, and accordingly we accept hypothesis H1, which states that cognitive strategy use enhances academic writing performance.

6.4. Interpretation

The study results reveal that the relationship between the research variables is considered moderate according to statistical standards. The findings support the positive association between students' use of self-regulatory strategies and their actual writing performance.

At this level of interpretation, a distinction arises between high performance (HP) and low performance (LP) participants in terms of the SR patterns they exhibit. Regarding the strategies devoted to the Regulation of Academic Cognition (M=3.04, SD=0.77), participants in both groups acknowledged the importance of elaboration and organization strategies during writing. Notably, nearly all respondents converged on resorting to goal setting and planning strategies (S1: HP 97,30%; LP 96,77%) to guide their performance. This reflects students' awareness of the signifcant role of setting goals in initiating and directing performance. As put by Sari et al. (2023), 'when they [*students*] have meaningful reasons for learning a language, they are likely to have more motivation to learn, which can lead to a more successful performance'. Besides, there were differences between the two performance groups, to the advantage of HP, in reporting cognitive strategy use, such as brainstorming techniques (S2: HP97,30% ; LP 83,87%), where they diverged more on resorting to their own background knowledge to generate ideas for the task (S3: HP81,08% ; LP74,19%) than on finding ways to relate the composition to other subjects (S4: HP86,49% ; LP 83,87%).

At a lesser degree, HP reported more use of organisation strategies than LP in drafting activities. They reported more use of strategies related to: mapping (S5: 64,86% ; 51,61%); outlining and illustrating material (S6 70,27%; 61,29%); categorising notes (S7: 72,97% ; 67,74%); revising and modifying the writing style (S9: 81,08% ; 67,74%); polishing the language to improve clarity (S10 : 94,59%

;74,19%) ; and editing the work to check for mechanical errors (S13: 67,57%; 48,39%). Meanwhile, both groups showed equal awareness of the importance of postwriting activities by reporting similar high rates on their attempts to understand errors and learn from mistakes for better future performance (S14: 89,19%; 90,32%), as well as on recording errors to avoid them in future performance (S15: 72,97% ;77,42%).

Turning to academic metacognition regulation, we find that HP depicted higher levels of regulation and monitoring compared to LP, which points out the relevance of metacognitive awareness in efficient writing performance. The related strategies consist of asking questions in the different stages of writing- planning, drafting, and editing as a form of Self-evaluation- for the purpose of monitoring and regulating performance (Kramarski, 2013; Wolters et al., 2003). For example, Mastery strategies are illustrated in participants reporting the way they attempt to identify areas or skills they do not or need to master (S16 : HP 62,16% ; LP 54,84%) ; and the way they seek personal relevance in performing the task by trying to determine very personalised gains from it (S18: HP 78,38%; LP 64,52%).

Likewise, the two groups displayed less marked degrees of instrumental strategy use. This is shown in their ways of asking questions to help monitor and focus their writing (S19: HP 62,16%; LP 51,61%) and generate more content when drafting (S21: HP 59,46%; LP 48,39%). Besides, marked differences, to HP advantage, were found in adapting performance to fit course requirements (S20: HP 62,16 %; LP 38,71%) which can be regarded as crucial SR skill. Similar rates are found in their adopting revision checklists to review composition, as a form of self-evaluation (S23: HP 59,46%; LP 41,94%). Both groups revealed similar ratings in using self-editing questions to revise and edit the work (S22: HP 78,38 %; LP 77,42%), which suggests examining other factors that account for performance differences.

6.5. Implications of the Findings

The study results fall in line with previous studies that support the positive association of SRL behaviour and academic performance in general (e.g., Alvi & Gillies, 2020 ; Harding et al., 2019), and more specifically the positive correlation between SR strategies and writing outcomes (Geres-Smith et al., 2019, as cited in Sari et al., 2023). Although the study revealed moderate correlations between SR strategy use and writing indices, it was found that the more self-regulated

students tend to perform better in academic writing than the less regulated ones. Echoeing Magno and Cayado's (2017, p.63) claim, the study supports that 'learners who adopt effective strategies of self-regulation in their studies and tasks are able to perform well'. This equally proves consistent with Joordan and Moonsamy's study (2015) in which they found out that 'students who report using more cognitive and metacognitive strategies do score higher on tests in the course, grades on papers, lab performance, as well as receive higher grades' (Pintrich, 1989; Pintrich et al, 1991; 1993; VanderStoep et al, 1996). Overall, the study results confirm the predictive nature of our independent SRL variable (e.g. Bai et al., 2020 ; Geres-Smith et al., 2019 ; Graham et al., 2000, as cited in Sari et al., 2023) by revealing the positive effect of SR cognitive strategy use in helping students cope with the complexities of academic writing and enhance their performance.

In addition to SR predictors, the study suggests the existence of external factors that underlie students' writing performance by **(47.2%)**. This indicates that other factors affect students' writing performance. Based on empirical evidence (Joordan & Moonsamy, 2015 ; Harris & Graham 2016, p.77), accounting for students' academic writing performance mainly relate to: (a) the complexity of writing process for students, which requires preparedness and adequate academic literacy i.e., linguistic and competency ability; (b) the current instructional models of writing, assessment methods, and instructor preparation, as major challenges encountered in developing effective instruction where cognitive processes involved in academic literacies are not made explicit in instructional practice;

In this respect, students need explicit and structured training to help them master the skills of effective academic writing, most particularly in the cognitive processes. The latter represent, in Ratangee's view (2007), the foundation of students' academic activities, and their knowledge need to be made explicit in formal instruction (as cited in Joordan & Moonsamy, 2015). More specifically, students need to be acquainted with a range of cognitive and metacognitive strategies to improve performance. For example, they need to be able to ask questions that would prompt them to generate content, monitor their progress, enhance their awareness of the basic aspects of compositions, as well as adopt efficient revising strategies, such as resorting to peer revising strategy (Brown & Campione, 1990; Hallahan, Lloyd,

Kauffman, & Loper, 1983; Reeve & Brown, 1985, as cited in Danoff et al., 1993). Accordingly, it is deemed pratical to equip students with a range of key SR strategies that hone their academic writing skill within classroom practice through the following steps (Harding et al., 2018, p.12-13):

- Observation of the different SR processes modelled by others, and depicted in verbal descriptions, guidance, and feedback.
- Imitation and practice of self-regulated learning behaviour.
- Internalisation of the strategy for more independent use.
- Recording successful strategies and monitoring progress on task.
- Monitoring – whereby both students and teachers reflect on the effectiveness of strategies used in view of adapting them for future performance.

These practical implications of the findings mainly involve an implementation of an SRL model in the EFL writing classroom, which can substantially contribute to hone students' academic performance and help produce proficient writers.

7. Conclusion

The present study focused on unveiling the ways students resort to SR cognitive and metacognitive strategies in academic writing performance. It adopted the correlational method to examine the relationship of the SR cognitive skills to the writing performance of Master 1 students of English by means of a self-report questionnaire and an index of performance. The overall findings revealed a moderate positive relationship between the use of cognitive/metacognitive strategies and writing performance. The research hypotheses were equally confirmed and supported by statistical results. This moderate relationship between the study variables was partially explained by the existence of extraneous factors that affected, at different degrees, students' writing performance and subsequent achievement. These were mainly related to students' linguistic skills and classroom instruction. An array of implications and recommendations highlighted the roles of the teacher and classroom instruction in honing students' writing performance through adopting a self-regulated approach.

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