Article

Metacognition in Academic Writing: Analyzing Strategies and Gender Differences among Moroccan University EFL Learners

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ABSTRACT

Metacognitive awareness plays a facilitative role for students to regulate, monitor, and evaluate their cognitive processes. While plethora of studies has been conducted in L2 writing context, yet little research has delved into the interconnectedness between metacognitive strategy use, gender as mediating factor, and writing performance in English as a Third language (L3) context. To fill this research gap, the present study tackled the relationship between students' awareness of metacognitive writing strategies and argumentative writing performance. It also sought to determine the role of gender in moderating this relationship. Using convenience sampling, eighty-two second-year university students were assigned an argumentative essay test and were administered an adapted version of a questionnaire to measure their awareness of metacognitive writing strategies during the writing process. Data were analyzed using various statistical tools, including multiple linear regression and ANCOVA analyses. Results indicated that although students demonstrating moderate levels of awareness of metacognitive writing strategies, this awareness did not strongly correlate (r=0.192) with their academic writing performance. Despite students' awareness of metacognitive strategies, they still lacked active implementation of these strategies. Gender analysis revealed the existence of slight gender differences in metacognitive awareness of writing strategies and writing outcomes, with females slightly outscoring their male counterparts on both metacognitive and writing achievement. To this end, we recommend implementing targeted explicit instruction and scaffolded support to aid students in applying these strategies effectively in their academic writing tasks. By fostering metacognitive awareness and emphasizing ongoing practice, students cannot only translate their metacognitive awareness into improved performance but also acquire the essential tools for academic success.

I. INTRODUCTION

More than any other language skill, writing is a heavily demanding linguistic and cognitive activity. Trilingual learners often face significant challenges to develop writing skills across various languages. Hence, to carry out a writing task in a multilingual and diglossic context such as Morocco (Sayeh & Razkane, 2022), metacognitive strategies are of higher utility for organizing, monitoring, and evaluating cognitive strategies to effectively fulfill objectives of a writing task (Amalia et al., 2023; Han, 2024). It is believed that metacognitive strategies help students become more proficient language learners (Flavell, 1976; Haukås, 2018) and aid participants to improve their academic writing skills (Alfaifi, 2022; Basaffar & Bukhari, 2023; Khan & Kumar, 2023; Razzaq & Hamzah, 2024; Razkane et al., 2024; Teng & Zhang, 2024). Other researchers (Razkane & Diouny, 2024, Razkane et al., 2023; Sumarno, 2020; Nabilla, 2022) found

that high achieving students use significantly more metacognitive strategies compared to low achievers. In the same vein, Khan and Kumar (2023) believed metacognitive strategies are essential in maintaining consistency and cohesion, enhancing critical thinking, and systematizing the writing process.

A significant proportion of English as a Foriegn Language (EFL) university students continue to struggle with different writing tasks (Abouabdelkader, 2018; H. Abouabdelkader & Bouziane, 2016; Chi et al., 2024; Elkhayma, 2020; Mallahi, 2024). Within the multilingual Moroccan context, with English being the third language (L3), the performance of Moroccan EFL university demonstrates weak composition skills (Abouabdelkader, 2018). Moreover, Oubadi (2024) reported that students' writings demonstrated multiple deficiencies ranging from structural aspects and language issues to language interference from Ll. Accordingly, Elkhayma (2020) indicated that students frequently utilized reference and lexical ties, while rarely employing ellipsis and substation techniques. However, their use of these reference ties and linking was not significantly correlated with writing scores. That is, although students employed a significant number of cohesive devices, their performance remained below average.

In addition to the linguistic challenges in writing, other studies have attributed L2 writing issues to lack of metacognitive strategies (Negretti & McGrath, 2018; Teng, 2021). Hence, an increasing trend of research about the critical importance of investigating metacognitive strategies in EFL writing has recently emerged (El Madani et al., 2024, Teng and Qin, 2024; Wang et al., 2024). These studies have been conducted to investigate the role of metacognitive strategies in shaping writing and reported that these strategies were found to improve writing performance. More specifically, research has highlighted that metacognitive awareness not only help students exploit their cognitive skills, but also raise their writing proficiency levels by making their writing more systematic (Razkane et al., 2024). In short, a good writing quality can depend on applying both cognitive and metacognitive writing strategies (MCWS).

Metacognition constitutes an indispensable part in the creation of high-quality written content. That is, learners necessitate the development of metacognitive implementation to produce superior-quality work (Rofiqoh et al., 2022). For instance, Basaffar and Bukhari (2023) found a significant positive association between learners' metacognitive knowledge and writing performance. Similar findings were reported by Han (2024) who demonstrated that writing achievement and motivation significantly elevated after using metacognitive strategies. While Wang et al. (2024) observed that metacognitive implementation boosted lexical variation and accuracy, Teng and Huang (2021) indicated that metacognitive strategies positively influenced writing accuracy but had no effect on fluency or complexity.

Contrary to the above findings, Oussou et al., (2024) reported non-significant relationship between argumentative writing and metacognitive awareness. This absence of significant relationship was justified by lack of appropriate understanding of metacognitive writing strategies. Additionally, Qin et al. (2022) found that the participants' metacognitive knowledge correlated significantly with their writing performance and reported that more proficient EFL students demonstrated better metacognitive knowledge in the three metacognitive writing processes compared to the less proficient counterparts. Confirmatory results were reported by Hartina et al. (2018), who indicated a significant correlation between students' use of metacognitive strategy and their essay writing performance. In other words, the researchers concluded that MCWS made a substantial contribution to students' performance, accounting for 70.7% of the variance.

Despite the benefits of metacognitive strategies, students continue to experience difficulty in writing because they still need to gain an awareness of metacognitive knowledge (Ramadhanti & Yanda, 2021). They do not possess neither conceptual (declarative) knowledge to develop ideas, nor pragmatic (conditional) knowledge, so they are unable to apply the right strategy due to lack of procedural knowledge. Consequently, students do not execute the proper steps in writing and are not aware of the importance of metacognitive strategies (Ramadhanti et al., 2019). Thus, metacognitive knowledge serves a guiding path throughout the writing process to ensure a well-designed and organized piece of writing. Overall, the three metacognitive processes

discussed in this section are distinct in the role played and the order of occurrence within writing. Each process occupies a unique position within metacognition and contributes and complements to create a self-regulated learning and performance improvement. In short, metacognitive strategies in writing can enable students to properly select the best strategies that can guide the writing process and consistently regulate their performance to spot gaps and pitfalls to perform effectively (Rosdiana et al., 2023; Teng & Zhang, 2020).

Studies also examined gender differences in the use of MCWS. For instance, Moqabali et al. (2020) reported findings in which they concluded that students reported a high level of using metacognitive writing strategies. Moreover, female students were found to have more use compared to male counterparts. These findings were further supported in a study by Maharani et al. (2018) on the use of writing strategies in relation to gender and linguistic proficiency, who reported gender differences, in which female students employed various metacognitive strategies, while males were found to highly use memory strategy. Similarly, Mutar and Nimehchisalem (2017) demonstrated a significant gender disparity, revealing that female students employed writing strategies more frequently than their male counterparts.

In summary, the majority of studies stress on the importance metacognitive strategies for university students in navigating the challenges of academic writing. The latter involves three key stages of metacognitive engagement: planning, monitoring, and evaluating. However, despite the significance of these strategies, students often lack the necessary metacognitive knowledge, leading to challenges in idea development, strategy selection, and execution during writing. Some studies demonstrated high use of metacognitive strategies among learners, others pointed to a lack of awareness regarding their benefits. Research suggests a positive correlation between metacognitive strategy use and writing performance, with higher proficiency groups demonstrating greater metacognitive knowledge.

Moreover, to our knowledge very few studies have addressed the correlation between university students' use of MCWS and writing performance in the Moroccan context (El Madani, 2024). Little to no study has considered other factors, such as gender, that could have a possible effect on the interplay between MCWS and writing performance among Moroccan learners. In other words, whether gender affects metacognitive strategy utilization is still under-investigated. Moreover, gaps in the literature persist, including the need for more representative samples and further exploration of the link between metacognitive strategy use and writing performance in different contexts with different age groups.

Theoretically confined within human cognitive development (Zhang & Qin, 2018), the present study addressed the aforementioned gaps by investigating Moroccan undergraduates' level of awareness regarding MCWS and how this awareness relates to writing performance. By determining the extent to which students are aware of planning, monitoring, and evaluating processes, this study can help create autonomous learners able to orchestrate, plan, control, and evaluate their writing process, which can help them yield good-quality essays. Besides, understanding this relationship can offer great insights into which metacognitive strategy leads to successful writing. Thus, the current study also examined the extent to which gender mediates the link between the MCWS and writing. To that end, three main questions were developed:

1. To what extent are Moroccan undergraduate EFL students aware of MCWS?

2. Is there a significant relationship between students' knowledge of MCWS and their writing performance?

3. To what extent does gender mediate the association between students' metacognitive awareness and writing performance?

Overall, while reviewing national and international research, it was noticed that the amount of research has dealt with either the direct association between metacognitive awareness and writing performance (Handayani et al., 2023; Ramadhanti & Yanda, 2021; Rosdiana et al., 2023) or descriptive studies regarding awareness of metacognitive writing strategies (Frendi & Pulungan, 2022; Pramesti et al., 2023). Meanwhile in the Moroccan context, there is a dearth of evidence pertaining to the association between metacognitive awareness and writing performance (El Madani et al., 2024; Oussou et al., 2024; Razkane et al., 2024). There is a limited number of research which examined Moroccan EFL learners'

knowledge of MCWS when dealing with L3 writing tasks. Only Razkane et al. (2024) examined the effects of MCWS on writing outcomes among high school students. Hence, this current study not only investigates the relationship between metacognitive awareness and writing performance in L3, but also examines gender as a covariant in the interaction between MCWS and writing achievement.

II. METHODS

This section discusses the methodology employed in the current research. It presents the research design and proceeds with a description of the context of the study, including the setting, participants, sampling procedures, data collection tools, and data collection procedures.

Study design

The current research delved into the awareness of MCWS among Moroccan EFL students in their fourth semester within the Doukkala region. Employing a quantitative approach and opting for a correlational research design, our aim was to elucidate the associations between MCWS awareness and writing proficiency, facilitating a deeper understanding of the factors influencing writing performance among EFL learners in this context. Through this methodological approach, we aimed to yield insights that contribute to the enhancement of writing instruction and support strategies tailored to the needs of Moroccan EFL students.

Participants

The study was conducted in a higher education institution, namely Chouaib Doukkali University, Faculty of Letters and Humanities in El Jadida. The participants were second-year university (semester 4) from El Jadida province, Morocco. These students study Standard Arabic as L1, French as L2, and English as L3. Using convenience sampling, the original number of participants was 100 semester-four students. However, the sample ended up with 82 fourth semester undergraduates from the English department due to 18 participants not fully completing all the questionnaire items. The sample included 56 female (68,3%) and 26 male (31,7%) participants. Despite the inequality of distribution of gender, we conducted regression and ANCOVA analysis to control for gender and see its impact on both writing and awareness of MCWS. The

choice of this grade is warranted because students should have developed and acquired the necessary argumentative writing skills. The sample had an age range of 18-21 (M=21.91).

Materials and Instruments

The data was collected through a questionnaire and a writing test. The writing achievement test assessed university students' proficiency based on three metacognitive writing strategies, while the questionnaire elucidated extensive information about students' awareness of metacognitive writing strategies.

The writing test

To evaluate students' writing performance, a writing task was distributed before questionnaire. Students were asked to write an argumentative essay. The latter is a piece of writing designed to encourage students in developing their analytical capacities. Argumentative essays engage students in detecting flaws, assessing the credibility and suitability of their arguments, and expressing themselves succinctly and logically (Ma & Li, 2022). The rationale behind the choice of this type of writing emanates from the high cognitive effort that it requires. Students will also have to rely on high order thinking skills (metacognitive) to construct the essay. In addition, based on some of the findings from the literature, students tended to have more difficulties in organization and logical connection of ideas, which are some of the key features of an argumentative essay.

The test was given as part of regular classroom task rather than under strict examination condition. The participants were given the freedom to choose between three different topics. Topics: (1) "Is it fair that people who have no special skills or good educational background get rich and famous through social media?" (2) "Are standardized tests an effective way to assess someone's knowledge?"and (3) "Will the death penalty be effective in lowering crime rates?" students were asked to write the essay in no more than 250 words, which equals four paragraphs. The purpose of the latter was to assess the participants' writing performance and compare their writing scores to their use of MCWS.

Afterward, the test was graded by three raters, including the researcher and two high school teachers of English, using an analytical scoring rubric. The inter-rater reliability of the three judges

was found to be remarkably high, with Cronbach's Alpha coefficients of .997 for both the original and standardized items. Such high values near 1.0 suggest strong reliability, demonstrating high accuracy and precision in the assessment process.

An Adapted version of Questionnaire on metacognitive awareness

Following writing an academic essay, the participants were administered an adapted version by Razkane et al. (2024), which is based on the *Questionnaire on Language Learners' Metacognitive Writing Strategies in Multimedia Environments (LLMWSIME)* (Zhang & Qin, 2018). Based on a six-point Likert scale, the participants were required to state their level of agreement on the items presented, ranging from 1 to 6, with 1 indicating strongly disagree and 6 indicating strongly disagree. The rationale behind using a 6-point Likert scale was to prevent the participants from selecting the midpoint (neither disagree nor agree). The LLMWSIME was selected based on two reasons. First, it tackles the metacognitive writing strategies and assesses the amount of awareness that learners have of them. Second, the questionnaire also contains the major metacognitive strategies such as planning, monitoring, and evaluating, which were the prime focus of this study. Besides, questionnaires have been widely used in metacognition research, which explains why it is regarded as the primary data collection instrument.

The first seven questions are specifically designed to assess planning strategies, followed by twelve questions focusing on monitoring strategies, and then four questions dedicated to evaluating strategies. Since the data collection process was not conducted in one fell swoop and despite the instrument being validated in numerous studies, it was cross-checked for reliability with 20 participants to see if needed to modify some items from the questionnaire for the upcoming phases. The reliability of all the items in the questionnaire was assessed by Cronbach alpha. All three sections of the questionnaire showed significant index of reliability with (Monitoring: $\alpha=0.91$; Evaluating: $\alpha=0.89$; planning: $\alpha=0.82$) respectively, which are all high values since $\alpha>0.70$.

Procedures

All the professors were contacted prior to data collection to get their informed consent. During the questionnaire administration, some participants were skeptical about the nature of the topic and hesitant to fill in the questionnaire. Consequently, we informed all the participants that the writing test and questionnaire were part of an academic research project. We also highlighted that while their participation was highly valued and appreciated, it remained confidential and optional to reassure them and alleviate their worries. We also sought to involve and motivate as many students as possible by offering individual feedback on their essay production upon request.

Professors were also informed about devoting a time frame of 1 hour and 10 minutes from their respective sessions. The students were provided with a paper-based test and a questionnaire. The first hour was devoted to the writing performance test, and right after the completion of the test, they filled in the questionnaire within a 15-minute time frame. This order was chosen because the metacognitive writing processes that framed the questionnaire accounted for an essential part of the student's writing test. Apart from measuring the students' metacognitive awareness, the writing test helped to prepare the way for some items in the questionnaire and provided them with concrete examples of questions assessing each metacognitive writing strategy. It is essential to mention that during the questionnaire completion, students were offered guidance and explanations regarding all the items.

Data Analysis

The data obtained were analyzed using SPSS version 25. The data were analyzed using both descriptive and inferential statistics. More specifically, descriptive statistics presented the distribution of the investigated variables by using means, standard deviation, percentages, and percentiles. Furthermore, Multiple linear regression analysis was employed to predict the writing scores, accounting for the usage of metacognitive strategies when doing the writing task. Finally, the ANCOVA test was run to examine gender as a potential covariate in the association between MCWS and writing performance. It is important to highlight that prior to running the ANCOVA test, all assumptions, including data normality and homogeneity of variance, have been met.

To analyze the writing test, an analytical scoring rubric was employed to assess the performance of

students. The rubric was composed of two levels: the Macro-level and the Micro-level. The former encompassed three different components, including organization, content, and development of ideas. The organization item referred to the extent to which students comprehended the overall meaning of the task. They were also graded for their degree of use of connectors to establish coherence and develop ideas to guarantee cohesion. As far as the micro-level is concerned, it includes a combination of language mastery. Starting with grammar, which was evaluated based on how many mistakes students would make in their essays. Second, the degree of mastery in the use of lexical items and how their understanding of the jargon was also taken into consideration. Moreover, students were graded based on their punctuation and spelling accuracy. All these items were put on a scale ranging from Below Expectations (0-8), Needs Improvement (9-11), Satisfactory (12-14), and Excellent (15-20).

III. RESULTS

This section unveils the results obtained from the current research. The findings deal with different constructs associated with students' metacognitive awareness of writing strategies. The findings are presented in accordance with the order of the research questions.

The Participants' awareness of MCWS

The current study explored the relationship between metacognitive awareness and writing performance. Results obtained from the LLMWSIME indicated that the students demonstrated moderate level of awareness of MCWS. Students' knowledge of planning (M= 4.30, SD= 0.96), monitoring (M= 4.56, SD= 0.78), and evaluating (M= 4.69, SD=1.114) were relatively high. These results suggested that fourth-semester students exhibit diverse levels of awareness regarding MCWS. When considering planning, monitoring, and evaluating strategies collectively, students demonstrated a notably stronger grasp of evaluating strategies compared to planning and monitoring. Scores of standard deviation implies that certain students may possess a more heightened level of awareness of these strategies than their peers. Table 1 illustrates the participants' mean scores with regard to planning, monitoring, and evaluating strategies.

Table 1. Descriptive statistics of the participants' awareness of MCWS

Strategy	Mean	Std. Deviation
Planning	4.3031	.96588
Monitoring	4.5640	.78254
Evaluating	4.6951	1.11459

The Participants' writing scores

Results also revealed that the mean score for fourth-semester students' writing performance was M = 8.64. This indicates that, on average, the students achieved a writing score of approximately 8.64 in their fourth semester. On this basis, the present analysis also reported the distribution of writing performance at ranges or benchmarks: Below expectations range (0-8), Needs improvement range (9-11), Satisfactory (12-14), and Excellent (15-20). The purpose was to conduct a detailed scale anchoring analysis to describe writing performance at these benchmarks.

Descriptive statistics offered an overview of the judges' performance and variability in their evaluations. The mean scores indicate the average performance of each judge on the writing test. Judge 1 achieved a mean score of 8.68 with a standard deviation of 3.84, Judge 2 obtained (M=8.80, SD=3.72), and Judge 3 had (M=8.42, SD=3.80) as illustrated in Table 2.

Table 2. Means and standard deviations of the three judges on the writing test (N=82)

	Mean	Std. Deviation	N
Judge1	8.6829	3.84279	82
Judge2	8.8079	3.72456	82
Judge3	8.4299	3.80206	82

In other terms, the results demonstrated that 47 students who scored below expectations (0-8) constitute 57.3% of the grades. This number represented more than half of the students who took the writing test. The second benchmark, needs improvement, contained 16 students, who account for 18.3% of the grades. The third range, satisfactory, encompassed only eight students with a corresponding percentage of 18.3%. Lastly, among the proportion of students investigated in this study, only seven students reached the advanced benchmark, which was an excellent performance, with a percentage of 7.3%. In short, the findings revealed that students performed slightly below the average at the below-expectation benchmark, with a M=8.64 and SD= 3.77.

Metacognitive writing strategies and writing performance

As stated throughout the paper, we also investigated whether there is a relationship between students' awareness of the three metacognitive strategies and their writing performance. A multiple linear regression analysis was run to assess the effect of the three independent variables simultaneously and determine their relative contribution to the prediction of writing performance. Table 3 below provides the model summary statistics for the multiple linear regression analysis, examining the relationship between writing performance (dependent variable) and the predictors (evaluating, planning, monitoring).

Table 3. Regression analysis results for predictors of writing performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.192[a]	.037	.000	3.77846

a. Predictors: (Constant), evaluating, planning, monitoring

b. Dependent variable: Writing performance

In the above model (Table 3), the R-value is 0.192, suggesting a weak positive correlation between the predictors and writing performance. In this analysis, the R Square value is 0.037, indicating that approximately 3.7% of the variance in writing performance is accounted for by the variables of evaluating, planning, and monitoring. In short, the correlation tests revealed a weak positive correlation between the participants' awareness of metacognitive writing strategies and writing performance.

To determine the relative contribution of the metacognitive writing strategies on participants' writing performance, initially building on the correlations, the stepwise method was used to insert the variables in the regression equation, but no variable was entered. This is due to the weak correlations obtained. Table 4 below shows the final model, with all three independent variables inserted into the regression equation based on the theoretical considerations. Planning was entered first, followed by monitoring and evaluation at the end.

The outcomes showed that the three predictors did not have an effect on writing performance. The coefficient for planning was negative ($B = -0.152$, $SE = 0.691$, $\beta = -.039$, $t = -0.220$, $p = .82$) but not statistically significant; this suggests that changes in planning scores have minimal or no impact on the writing performance scores. Similarly, the coefficient for monitoring was positive but not statistically significant ($B = 0.29$, $SE = 0.93$, $\beta = .062$, $t = 0.320$, $p = .749$), indicating that variations in monitoring scores are not associated with significant changes in writing performance. The coefficient for evaluating was positive ($B = 0.57$, $SE = 0.64$, $\beta = 0.168$, $t = 0.98$, $p = .37$) but not statistically significant. In summary, the three metacognitive strategies (planning, monitoring, and evaluating) did not predict writing performance. Judging by the results of the multiple linear regression analysis, the lack of significance means that these variables do not play a substantial role in explaining the disparities in writing performance.

Gender, students' awareness of MCWS, and writing performance

The study also examined the extent to which gender mediates the relationship between students' awareness of metacognitive writing strategies and writing performance. The ANCOVA test showed that the interaction between metacognitive awareness and gender did not have a statistically significant effect on writing performance, $F(3, 5) = 0.060$, $p = .979$. The partial eta squared ($\eta^2 = .03$) suggested that the interaction between MCWS and gender accounted for a small proportion of the variances in writing performance. That is, students writing achievements were partially explained by

Table 4. Regression analysis of the independent variables on writing performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.255	2.499		2.103	.039
	Planning	-.152	.691	-.039	-.220	.826
	Monitoring	.299	.933	.062	.320	.749
	Evaluating	.570	.641	.168	.890	.376

Table 5. ANCOVA results: Writing performance across metacognitive strategies (controlling for gender)

Dependent variable: Writing performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Model	7109.066[a]	77	92.326	2.738	.129	.977
Metacognitive awareness * Gender	6.079	3	2.026	.060	.979	.035
Metacognitive awareness	90.185	4	22.546	.669	.641	.348
Gender	.313	1	.313	.009	.927	.002
Error	168.615	5	33.723			
Total	**7277.681**	**82**				

a. R Squared = .977 (Adjusted R Squared = .620)

the relationship between metacognitive awareness and gender (see table 5 below for more details). In support of the findings from the regression analysis, the effect of metacognitive awareness on writing performance was not statistically significant, $F(4, 5) = 0.66$, $p = .641$. This means that metacognitive awareness did not have a significant impact on writing performance. However, it is important to acknowledge that the effect size was relatively small. These findings suggest that while metacognitive awareness may have some influence on writing performance, its overall impact may be limited. Additionally, the main effect of gender on writing performance was not statistically significant, $F(1, 5) = 0.009$, $p = .92$. This indicates that there are no significant gender disparities in writing performance. Overall, there was no observed effect of gender as a mediating variable on the relationship between the awareness of metacognitive strategies and writing performance.

IV. DISCUSSION

The main findings reported, in this study, are second-year university students showed a moderate level of awareness regarding MCWS, with planning being the lowest and evaluating being the highest. Unexpectedly, the number of students who reached the excellent writing benchmark was drastically lower than those in the previous ranges. Secondly, weak positive relations were identified between the use of MCWS and writing performance, with evaluating having the highest coefficient and planning having the lowest. Lastly, ANCOVA revealed that both the interaction between metacognitive awareness and gender, as well as the main effects of Metacognitive awareness and gender alone, were also not statistically significant.

As stated earlier, students exhibited moderate knowledge of MCWS based on Oxford's (1990)

classification of the mean scores of strategy use. Building on the classification and since our study used a six-point Likert scale questionnaire, we adapted the range of items the following: high level of awareness (ranging from 4.5 to 6), medium (ranging from 3.5 to 4.4), and low (ranging from 1.0 to 3.4). our findings pertaining to metacognitive awareness corroborate the outcomes of several studies including those of Khan and Kumar (2023), Handayani et al. (2023), Moqbali et al. (2020), Alamri (2019), and Cer (2019), in which their participants had a moderate to high level of awareness regarding these strategies. The findings obtained in the current study perfectly matched the outcome of Alamri (2019) concerning students frequently employing the three metacognitive strategies, where evaluating was the most frequent strategy, followed by monitoring and planning. In short, all the studies demonstrated moderate to high level of awareness pertaining to students regarding metacognitive writing strategies and their importance in the writing process.

However, the findings of the current study also contradict those of other studies regarding the level of awareness, as seen in studies such as Goctu (2017), Ramadhanti and Yanda (2021), as well as the classification of the strategies combined in studies such as Frendi and Pulungan (2022), and Azizi et al. (2017). Gotu (2017) discovered that the majority of students did not employ MCWS. These contradictory findings can be attributed to the type of population targeted in that study, including computer technology students, which differs from the humanities and social sciences context.

Even though in the current study, students reported perceived awareness of metacognitive strategies and their significance, they still lacked active implementation. Particularly, through their

academic essays, students demonstrated lack of planning ideas because of poor organizational skills as well as significant writing issues due to ineffective evaluation strategies. Our explanations of the findings are supported from both literature and theory. As in Oussou et al., (2024), who revealed a weak positive correlation and concluded that there was gap between the knowledge and implementation of MCWS. Drawing explanations from metacognition theory, although students possessed declarative knowledge (being aware of MCWS), they still lacked procedural knowledge (performing MCWS). This disparity between awareness and effective utilization of metacognitive strategies can also stem from students lacking prior knowledge and exposure regarding these strategies.

Besides, Ramadhanti (2021) found that more than half had a low level of metacognitive awareness; this decrease in the level of understanding can be explained by the type of essay adopted in the study. While our research used an argumentative essay, the former used an exploratory one. Regarding the classification of these strategies based on level of knowledge, Frendi and Pulungan (2022) claimed that planning was the more dominant aspect used by students, which is inconsistent with our classification due to differences in the type of essay and the statistical techniques employed. Overall, we can conclude that the type of essay can influence students' level of metacognitive awareness. That is, different essay types can elicit different levels of use of MCWS.

Students' metacognitive awareness of strategies and writing performance

Initially, the results of the current study showed weak positive relationship between metacognitive writing strategies and writing performance. Increasing their metacognitive awareness may positively affect their argumentative text-writing skills. The weak positive correlations can be interpreted by students' lack of implementation of metacognitive writing strategies. This finding was endorsed by studies of Balta (2018) and Oussou et al. (2024), who found a weak positive correlation between students' metacognitive knowledge of strategies and their writing performance. Moqbali et al. (2020) agreed with our aspect of the absence of a significant relationship. However, there was a disagreement with the type of relations in which they reported a weak negative association while

our study declared a positive one. This could be explained by the different grade levels recruited for the study. Our study had university students, while theirs had high school participants.

Contrary to our findings, Azizi et al. (2017) and El Madani et al., (2024), who discovered a significant relationship between writing performance and all the three metacognitive writing strategies. The latter was in line with other studies in the literature (Basaffar & Bukhari, 2023; Al-Jarrah et al., 2019; Qin & Zhang, 2019). They all reported a statically significant positive correlation between the awareness of metacognitive strategies and writing performance. In other words, students with higher awareness tend to be high achievers or effective writers. Although the participants in our study demonstrated a moderate level of metacognitive awareness, the reason for the absence of significant correlation can be explained by the gap between declarative and procedural knowledge. This implies that students possess the knowledge but still need to gain the active and precise implementation of these strategies.

Gender as a mediator between MCWS and writing performance

The ANCOVA results showed that the effect of gender on writing performance was also slightly statistically significant. This implied that gender differences did not lead to significant variations in writing performance among the participants. That is, males and females performed equally in the writing. Accordingly, Surat et al. (2014) discovered no significant differences in using metacognitive strategies based on gender. These findings echoed other research that has also found comparable patterns regarding the use of strategies by the two genders. Other studies that unveiled gender differences included Moqbali (2020) and Maharani et al. (2018). They all confirmed that female students employed more metacognitive strategies than their males. These findings indicated gender disparities in the use and effectiveness of writing strategies.

To sum up, these inconclusive findings highlighted that there could be variations regarding the equation of gender, the use of MCWS across different contexts and cultural backgrounds. While some studies found no significant gender differences, others indicated that females may exhibit more frequent and effective use of these

strategies. Thus, we should carefully consider these contrasting findings when interpreting the role of gender in strategy utilization among university students.

V. CONCLUSION

The results examining the distribution of students' metacognitive awareness across three strategies demonstrated that students reported a moderate level of awareness regarding MCWS. The regression analysis revealed a weak positive correlation between students' awareness of MCWS and their writing performance. High- and low-achievers may differ based on their awareness of these strategies. Thus, to account for this lack of use, it is crucial for instructors to emphasize and teach these strategies explicitly, foster metacognitive awareness and nurture students with the essential techniques for academic success.

The analysis of covariance revealed that two genders did not significantly differ in terms of metacognitive awareness and writing performance. Specifically, gender did not influence the relationship between the two constructs. Thus, we call for more quantitative studies to further examine gender differences in awareness of metacognitive strategies and writing performance. In addition, we also call for the implementation of qualitative studies to uncover other factors which contribute to our comprehensive understanding of metacognition.

To account for the outcomes related to awareness and performance, several recommendations are directed toward policymakers, educators, and the educational institutions. Although the current study showed a weak correlation, it was a positive one. Thus, future experimental studies are called for to test metacognitive interventions and its impact on writing achievement in different learning contexts. We believe training students how to create goals, control their progress, and adopt effective writing strategies can help them become more independent and effective writers. Besides, metacognitive awareness of strategies in writing can facilitate the transferability to different writing tasks and contexts (Razkane et al., 2024). Students can apply the metacognitive strategies in different writing tasks to cope with various academic genres. The ultimate objective is to create a program of metacognitive writing instruction which would enhance students' writing skills and raise their understanding and implementation of metacognitive practices. In light of the obtained findings, one of the most prominent implication is explicitly teaching and fostering metacognitive skills can be beneficial in developing proficient writers and confident writers.

Despite of the current study having several strengths including a multilevel analysis that included both regression analysis and ANCOVA test, no research is perfect. One of the limitations of this study is the focus on a single population within the Moroccan context. While the participants represent the study's context and population, the results may not be applicable to other groups or settings. Thus, future studies should be conducted in other parts of the Moroccan context to provide insights from other academic contexts. Regarding avenues for future research, further studies exploring different dimensions and measures of metacognitive awareness could shed more light on its potential impact on writing performance. While differences in metacognitive awareness might exist in other domains, their impact on writing performance may be mitigated by other factors, such as individual writing abilities, motivation, anxiety, gender, or instructional practices. Exploring these factors in future research may provide a holistic picture regarding the influence of different constructs on writing performance.

ETHICS STATEMENT

This study confirms that the relevant informed consent was obtained from the participants.

CREDIT AUTHOR STATEMENT

All authors contributed equally to the manuscript.

DECLARATION OF COMPETING INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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