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| RESEARCH ARTICLE

Self-Efficacy Beliefs and the Effect of Metacognitive Strategy Training on EFL Student Writing Performance: An Experimental Study

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| ABSTRACT
The purpose of this study was to explore the mediational influence of writing self-efficacy and its relationship to the effect of metacognitive strategy training on Moroccan EFL student-writers' argumentative essay-writing performance. To this end, the study involved three distinct groups: two experimental groups categorized by their levels of perceived writing self-efficacy (high or low), and a control group. The two experimental groups received a treatment that consisted of metacognitive strategy training in the planning of an argumentative essay, while the control group received no intervention. The statistical results of the study showed that the two experimental groups displayed more improvement on the post-test than did the control group, whose performance remained invariable. Also, the experimental group with higher initial self-efficacy levels demonstrated more substantial enhancement in performance compared to the group with lower self-efficacy. This finding revealed that the level of self-efficacy seemed to influence mediationally the student-writers' writing performance. Interestingly, more than half of the second experimental group showed improvement on the post-test. Adopting the repeated measures method, the re-administration of the self-efficacy questionnaire to this group displayed that more than half developed their self-efficacy over the treatment period. This finding accounted for the improvement of their performance. It also corroborated the mediational role of self-efficacy. These findings collectively highlight the impact of students' confidence in their writing abilities on their overall writing performance. The results emphasize that writing self-efficacy can either facilitate or hinder students' writing progress, underscoring the importance of nurturing self-belief to foster effective writing development.

| KEYWORDS

Argumentative writing, metacognition, planning writing, process writing, self-efficacy, strategy training.

| ARTICLE INFORMATION

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1. Introduction

It has long been tenaciously held that there is a quasi-automatic direct relationship between the (meta-)cognitive training of any skill and its immediate application and use in the target situation. Numerous studies have suggested that metacognitive strategy awareness enhances academic achievement and learners who are metacognitively conscious of their own strategies have procedural advantage over those who are not when it comes to task performance. The possession of metacognitive strategies helps the learner to process the material deeply and fosters deeper levels of understanding and learning (Davidson & Sternberg 1994). It is postulated that if a given learner wants to be, say, a 'proficient' writer, he has to undergo explicit training on the types of strategies evidenced by successful writers and on when and how to know what skill set to be deployed in a particular writing context. There is no doubt that metacognitive strategy awareness contributes to achievement, but the question to be raised here is: to what extent is it guaranteed that when a given learner is trained on the use of a strategy or a skill will without fail, use it appropriately as expected?

Numerous research findings have shown that the relationship between the acquisition of metacognitive strategy knowledge and actual task performance is conceptually very complex and may involve other non-cognitive influential mediational factors (Garner, 1987). Some researchers who have carried out studies about the contribution of metacognitive strategy awareness to academic achievement admitted clearly that some of their experimental subjects who received the treatment did not benefit from the training and performed less than expected. In this respect, Abouabdelkader (1997) conducted an experimental study to see the extent to which metacognitive strategy instruction improves writing performance. He admitted that "not all the student-writers involved in the experimental group displayed enough improvements at the post-test" (pp. 262-263). They did not show improvement not because they did not know how to implement what they had been trained on, but maybe because of their lack of confidence in what they had acquired. This is attested to by a post-treatment retrospective interview whereby the experimental non-improving student-writers confessed that that they were fully aware of the task required skills but they did not simply make use of them. The other question to be put forward here is: why did these experimental subjects not bring into play their treatment-built strategies? Is it because they did not know how to put them into execution, or because their confidence in them was disproportionately insufficient?

Self and strategy research has demonstrated that metacognitive strategy training alone is not sufficient nor desirable to be adopted as the sole approach to skill instruction because it is restrictive to just the cognitive variables and disregards the socio-affective side of the learners (Gardner, Lalonde, & Moorcroft, 1998; Pajares & Schunk, 2001, 1994; Pajares, 1999; Zimmerman, 1995). It is not therefore surprising to find that learners who hold high positive personal beliefs about themselves and their capabilities outperform those who harbor self-doubts and are apprehensive about tasks, even though the two types of learners are on equal footing in so far as the task requirements and the skills involved are concerned. According to Bandura's (1986) Social Cognitive Theory, the beliefs that individuals develop about their capabilities, what he calls 'self-efficacy beliefs', powerfully influence how they will behave. While this does not necessarily mean that self-efficacy beliefs add to the learner' competence, it seems conducive to the generation of intrinsic interest and motivation in the task and arms the learner with sustained effort, resiliency, and determination when difficulties crop up along the way (Pajares & Valiante, 1997). This sense of personal agency, as it were, is believed to play a mediational role between past experience and skill knowledge and subsequent performance. Self-efficacy beliefs have also been found to be crucial mediators of all types of achievement (Pintrich & Schunk, 1996). It follows from what has been cited that the metacognitive approach to skill development neglects inadvertently the pivotal role of self-beliefs between skill-getting and skill-using, to borrow Rivers's terms (1973). The social cognitive approach comes then to account for and accentuate the active role of these beliefs and to show their contribution to academic achievement.

Based on the above, the present experimental study attempted to investigate the mediational impact of writing self-efficacy in relation to the effect of metacognitive strategy training on planning argumentative composition writing upon the overall student-writers' argumentative essay-writing performance. The study's two major questions were thus the following:

1) Does metacognitive strategy training enhance essay-writing performance?
2) What mediational influence, if any, do writing self-efficacy beliefs have to contribute to the improvement of the writing ability?

Based on these two questions and for the sake of consistency, four hypotheses were formulated as follows:

- Hypothesis N° 1: Metacognitive strategy training is effective in enhancing students' essay-writing planning performance.
- Hypothesis N° 2: The experimental student-writers with high self-efficacy will achieve better scores on the post-treatment test than the control group and their experimental counterparts with low levels of self-efficacy.
- Hypothesis N° 3: The two experimental groups will have consistent score achievement on the post-treatment test regardless of their level of self-efficacy.
- Hypothesis N° 4: The experimental student-writers with low self-efficacy will achieve better scores on the post-treatment test than their experimental counterparts with a high level of self-efficacy.

This study did not aim to comprehensively explore all the skills involved in the argumentative writing process. Instead, it focused specifically on the planning stage. In particular, it examined the mediating role of writing self-efficacy beliefs and the impact of metacognitive strategy training on planning argumentative compositions on overall student-writers' performance in argumentative essay writing. A simplified visual representation of the study's variables can be illustrated as follows:

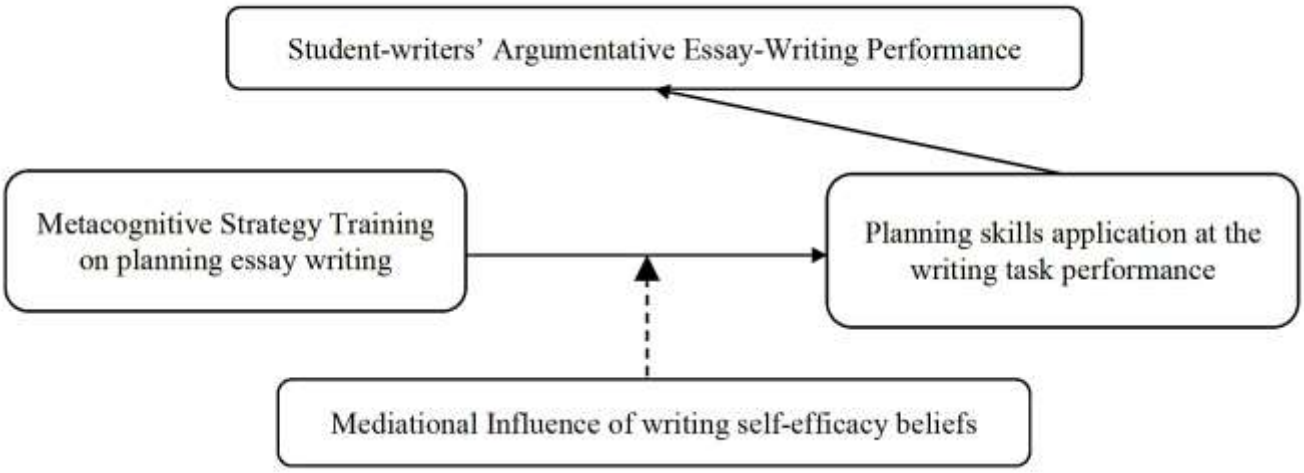

Figure 1. Scope of the Study

As the figure shows, self-efficacy beliefs and metacognitive strategy training are the independent variables and the student-writers' essay-writing performance is the dependent variable.

2. Literature Review

2.1 Paradigm Shift in Writing

Over the last decades, writing theory and pedagogy have witnessed a radical shift from the product-centered or model-based approach which views that "good writing [conforms] to a predetermined and ideal model" (Zamel, 1987, p.697), and an approach that follows a straightforward linear plan-outline-write action (Taylor, 1981), to the process-oriented approach that considers writing "[…] as a form of problem-solving which involves such processes as generating ideas, discovering a 'voice' with which to write, planning, goal-setting, monitoring, and evaluating what is going to be said as well as what has been written" (White & Arndt, 1991, p.3). Implicit in the last quote is the fact that composing a piece of writing is a *non*-linear cyclical process in which the processes of planning, writing, and evaluating are in a constant recursive interaction from the very instant of thinking of writing a topic to the production of the final polished draft.

This shift of emphasis from the 'slavish' product emulation to the process was fueled in part by the growing dissatisfaction with the inefficiency of the model-based approach to teaching writing that overemphasizes the mechanical breakdown and re-assemblage of a 'sacred' model and puts a premium on accuracy and absolute error-freedom. This model-oriented method is said to inhibit "creative thinking and writing" (Silva, 1990) and turns the learner-writer into "a mere responder and mimicker of other people's thoughts and expression" (White, 1988, p.6). Research studies into what writers do as they compose and their insightful findings were also a major catalyst behind this theoretical paradigm shift in writing. The case studies of Janet Emig (1971) of the composing process of twelfth graders and other researchers' studies such as Zamel (1982b, 1983), Raimes (1985), Perl (1980), Flower and Hayes (1981b), to name just a few, made tremendous contribution to the understanding of the composing process and offered valuable implications to writing research and pedagogy.

2.2 Writing and its Cognitive Processes

As writing is one of the most complex human mental activities, its amazing complexity arises from the fundamental question: what happens when people compose? This question has been approached differently by a variety of disciplines but has not yet been satisfactorily answered. Despite the alarming note Murray (1980, p.14) sounded concerning the difficult scrutiny of the writing process when he said that:

> Meaning is made through a series of almost instantaneous interactions. To study those interactions within ourselves, other writers, or our students, we must stop time (and therefore the process) and examine single elements of the writing process in unnatural isolation.

Numerous studies tried, however, to uncover the mental inner workings of writers as they compose. Following is a report on some of the well-known research studies and findings in this regard.

Ever since Emig's case study of her twelfth graders, a host of researchers followed suit to study the nature and the types of processes involved in composing. They made use of a variety of new-fangled research instruments such as think-aloud protocol analysis, case studies, retrospective self-reports, and many more, with the passionate desire to capture a snapshot of "the flow of composing" as Perl (1980) put it.

Zamel (1983) found in her study of advanced L2 student-writers that the processes of composing—typically seen as prewriting, writing, and reviewing—do not adhere to the linear sequence once believed under the model-based approach. Planning, for instance, is reported to take place not only during the writing process but also during the reviewing phase. She concluded that the composing process is "creative and generative and may not be based on a clear sense of direction or explicit plan, but rather a plan that allows for further discovery and exploration" (p. 180).

In another study on the composing process of unskilled ESL students, Raimes (1985) corroborated Zamel's findings on the recursiveness of writing. All the students made what Perl (1980, p.396) called "the shuttling backward-and-forward movements of the composing process". They read, then write, then edit. They read, then edit, then write and the cycle continues throughout. These unpredictable 'jumps', as they were, are said to be largely determined by the writer's goals (Dyson & Freedman, 1990). It is interesting to note incidentally that the backward movements in writing correspond closely to the eye-regressions found in the behaviour of readers as they read (Gough, 1972).

Using the think-aloud protocol analysis, Perl (1980) investigated the repetitive 'basic patterns' of the composing process of a group of teachers who were asked to compose aloud into a tape recorder on an assigned topic. The first finding of this study showed that all the writers kept moving forward and backward all the way through their composing. Perl explained that the generating wheel of composing keeps going only thanks to the backward movements the writers made. When the process seems to come to a halt, then writers go back to something they have written in the hope to muster momentum for the next step. In this respect, it is noteworthy to mention that there are several observational studies on the pause-time during composing. Matsuhashi and Cooper (1981) found that the longest pauses during writing happen during planning for about two-thirds of the total composing time against one-third for actual writing and reviewing together. By the same token, Rosenberg (1977; in Black, 1982) maintains that the longest pauses of his student-writers happen when they are trying to retrieve unrelated semantic content from the long-term memory. Returning to Perl, she found two basic processes in the composing process of her subject writers, namely *retrospective structuring* which refers to the backward moving over what has been written in the hope to make composing go forward and *projective structuring* that pertains to the "ability to craft what one intends to say and make it intelligible to others" (p. 368) by attending to their needs and expectations.

These research studies and others give empirical testimony to the recursive nature of the writing process and despite the varied multiplicity of designations tagged to the processes involved in the act of composing such as *reviewing/drafting/revising* (Murray, 1980), *planning/translating/reviewing* (Flower & Hayes, 1981b), *idea generation/text production/text editing* (Bruce *et al*., in Black, 1982), *pre-writing/transcribing/post-writing* (Nold, 1981) and the list could go on, there seems to be three fundamental processes that we may call pre-writing, writing, and rewriting. These processes are believed to be highly interactive and overlap all the time in a recursive holistic process called *composing*.

2.3 Planning in the Writing Process Models

Numerous prototypical models of the composing process have been developed based on research findings and have been empirically tested for validation and their psychological reality. This discussion will focus on three well-known process models, with special attention given to the planning component. The aim is to understand how planning fits into each model and interacts with the other processes.

2.3.1 Flower & Hayes's Model -- 1980

When examining process models during the cognitive stage of writing process development, Grabe and Kaplan (1996) noted that Flower and Hayes (1980) synthesized their own and others' research findings to develop a cognitive model. This model consists of three interacting operational processes responsible for text production: planning, translating, and reviewing. As depicted in the figure below, the planning process, where the writer "sets goals and plans the content of a paper" (Flower & Hayes, 1981b, p. 41), is further decomposed into three types of processes: generating, organizing, and goal-setting.

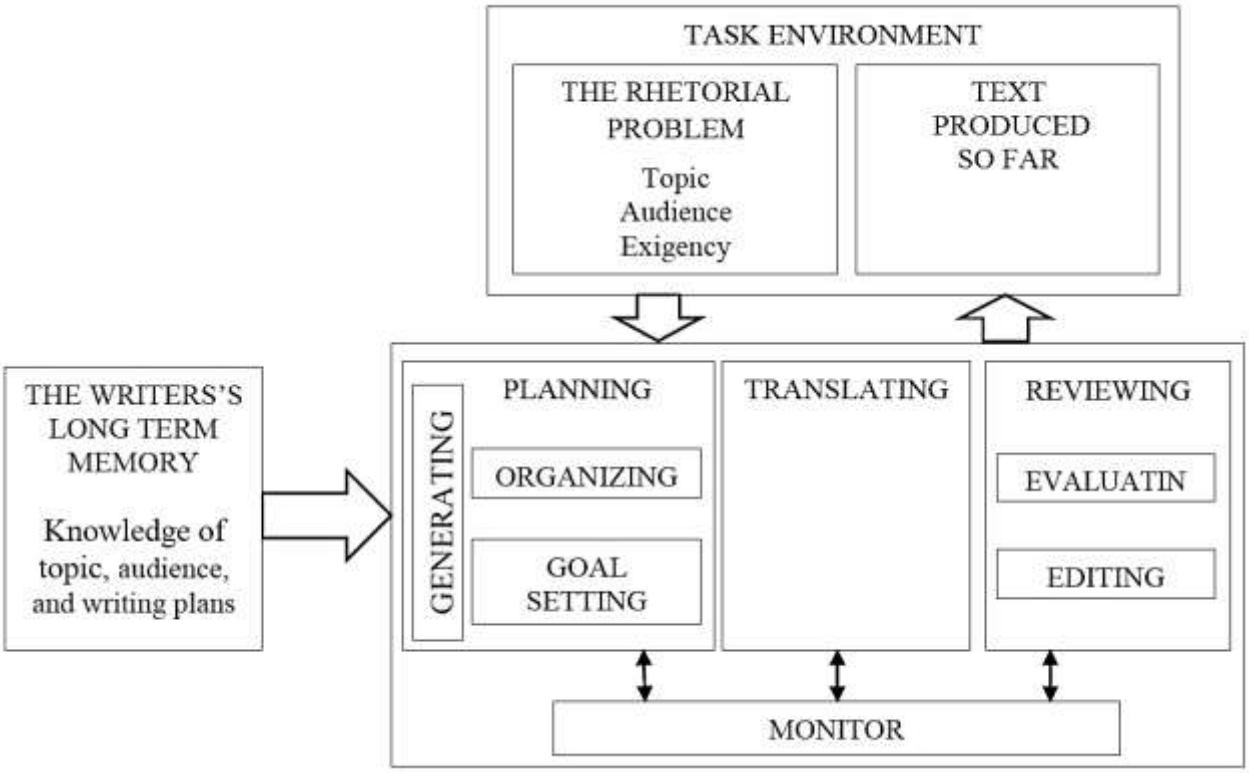

Figure 2. Flower and Hayes' Writing Process Model (Source: Grabe & Kaplan, 1996, p. 92)

In a subsequent article titled "Plans That Guide the Composing Process" (1981b), Flower and Hayes delved deeper into the planning component of their model. The following section explains the types of plans involved in the planning process, as illustrated in the figure below.

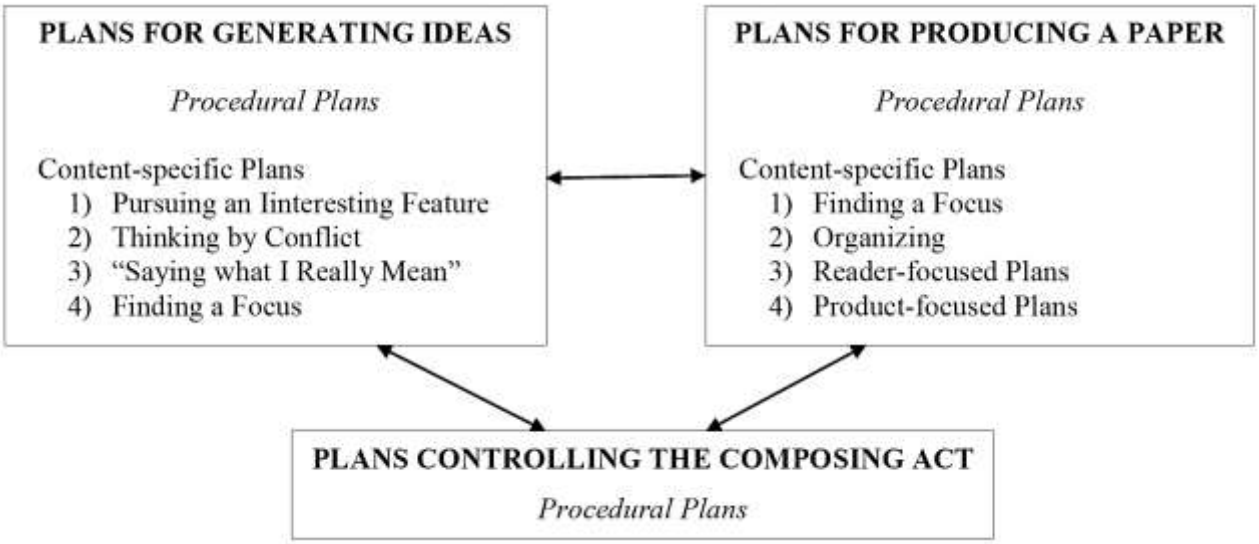

Figure 3. Plans Writers Use in Composing (Source: Flower & Hayes, 1981b, p. 42)

2.3.1.1 Idea Generation Plans

These plans refer to the writer's attempt to produce information about a topic. Idea generation plans are of two kinds: 1) *Procedural Plans* or the 'how-to' plans: they allude to the writer's heuristic strategies, such as brainstorming and outlining to generate content on a writing topic; and 2) *Content-Specific Plans*: these are concerned with the writer's search for topic-related 'raw' information from the long-term memory or external resources such as books, articles, etc. The second type of plans subsumes under it four categories of content-specific generating subplans. While the first three subplans (i.e., Pursuing an Interesting Feature, Thinking

by Conflict, and WIRMI) are adopted by the writer to keep going the wheel of content generation during composing by either further exploring an enticing idea, word, or an opinion that has been written or by trying to find a contradiction to something jotted down, or simply explaining a previously written note. In 'Finding a Focus' plans, the writer readies himself for the transformation of the ideas into a first-draft text by specifying a purpose around which to weave the generated strings of ideas.

Overall, the main function of the generating process, according to Flower and Hayes, is to build up a network of topic-related ideas about the topic of the writing assignment through the employment of strategic content-specific skills.

2.3.1.2 Paper Production Plans

After making use of a battery of operational skills to generate ideas and establish a focus, the writer is ready to transform the ideas into a paper. As the figure delineates, there are also *Procedural* and *Content-Specific Plans* for producing the paper. *Procedural Plans* here pertain to the writer's strategies such as *try-and-write something* strategy as reported in the protocols to work out an outline for low-level editing processes; that is to say, editing related to matters such as spelling, clarifying an ambiguous idea, etc. *Content-Specific Plans,* on the other hand, relate to the transformation of ideas into an outline-based language. Paper producing Content-Specific Plans includes four types of plans: I) *Forming for Use Plans* which refer to the attempt made by the writer to select from the plethora of the generated ideas what to use and how to use it; II) *Organizing Plans* signify the sequential ordering in outline form the significant ideas around the already established focus; III) *Reader-Focused Plans* make reference to the writer's communicative strategies such as *audience analysis* and *tests* and *role-playing* to impersonate the role of the reader in order to know the needs and expectations of his audience and allow for that in writing to them; and IV) *Product-Focused Plans* that occur "when the composing process is governed by a concern for the form of the finished product" (Flower & Hayes, 1981b, p. 49). Put differently, product-based plans constitute the writer's trial plans to produce an outline on the basis of the 'formal features of a completed outline' of the final text. It merits noting here that the over-concern with the final product formal details in the course of composing makes the latter run the risk of being 'disrupted'. To sum up, Paper Production Plans inclusive of both Procedural and Content-Specific Plans have as one goal the creation of a significant well-ordered outline and therefore giving structure to the large body of generated ideas. The end is an outline.

2.3.1.3 Goal Setting Plans

These plans refer to the writer's intention to set goals and subgoals concerning the audience and the intelligible quality of the final product**.** Collins and Genter (1980, in Esynck & Keane, 1990) identify in this respect four general goals in writing. When we write we set goals to make our text a) comprehensible, b) attractive, c) persuasive, and d) rememberable.

Two important facts are to be emphasized here. Planning is not an isolated process but rather it is related to a rhetorical problem that needs to be solved, and to the writer's long-term memory. As Widdowson (1983) pointed out, writing is a "provoked activity" in that it does not take place in vacuum. Writers do not usually start composing something from scratch but rather they all the time have a problem to solve (hence the rhetorical problem). This rhetorical problem according the model is situated in the task environment that includes the writing assignment and specifications about the context, the purpose, and the target audience. Planning also interacts with the long-term memory to retrieve information relevant to the topic and the goals set.

Finally, Flower and Hayes (1977) contended that the processes of planning, translating, and reviewing occur in a recurrent fashion and not in a predictable stage-based sequence.

2.3.2 Scardamalia & Bereiter's Model [1] -- 1987

Convinced that one single model can never account for the existent differences between skilled and unskilled writers, Scardamalia and Bereiter (1987) proposed a two-model approach to the writing process, consisting of the knowledge-telling model and the knowledge-transforming model. First, the knowledge-telling model refers to the way novice writers compose and how they effortlessly produce a text by simply retrieving from the long-term memory an already assembled body of knowledge without any kind of goal-directed planning. Second, the knowledge-transforming model (see Fig. 3) describes how expert writers, through the use of high order problem-solving strategies retrieve data from the long-term memory and fashion it to solve the content and the audience rhetorical problems of a writing task.

[1] Since the knowledge-telling model does not contain a planning component, no figure of the knowledge-telling model is provided.

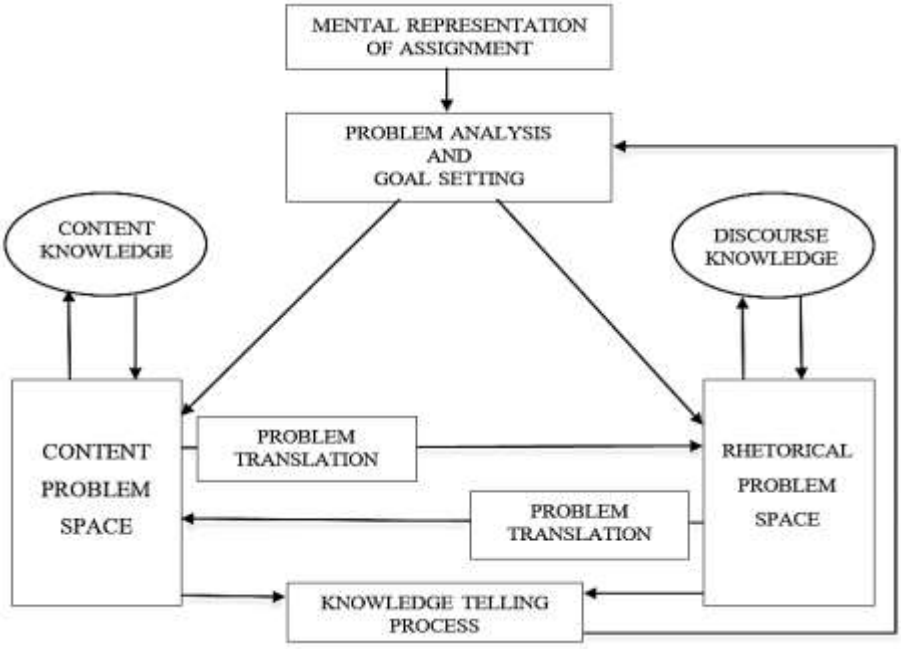

Figure 4. Structure of the knowledge-transforming model (Source: Scardamalia & Bereiter, 1987, p. 146)

Within this theoretical framework, writing is conceived of as a continuously recursive problem-solving process. According to Scardamalia and Bereiter, the way knowledge is generated into the writing process and the alterations it undergoes in the process is the principal distinction that sets apart the two models, and hence mature and immature writers. To them, novice writers *can* be trained out of the knowledge-telling mode of composing into the expert mode through scaffolded modelling.

As shown in *Figure 4*, the writing process is broken down into four processes: 1) mental representation of the assignment; 2) problem analysis and goal-setting; 3) problem transformation; 4) and knowledge-telling, which is included here as a subprocess. Planning in this model is situated in the problem analysis and goal-setting space. It is there where the expert writer analyzes the 'rhetorical problem' (Flower & Hayes, 1981b) into subproblems and therefore sets content-related goals and subgoals towards the resolution of the subproblems. These subproblems refer here to the rhetorical specifications of the task requirements that include the text structure and genre, the tone, the purpose, and the needs and expectations of the target audience. After the planful expert writer represents mentally the topic of assignment and breaks the whole problem into rhetorical subproblems, and sets subgoals to solve each of the subproblems, he then generates topic-relevant knowledge from the long-term memory to be transformed and shaped in the rhetorical problem space. When the rhetorical problem is solved, there comes into action the knowledge-telling process wherein the writer simply records the ideational content that has been generated, organized, transformed, and translated into the first draft, which, in turn, will be edited towards the final text.

2.3.3 Kellogg's Model -- 1994

On the basis of the models of Flower and Hayes (1980) and Scardamalia and Bereiter (1987) as well as his personal findings, Kellogg (1994) proposed an elegant model that includes and extends the two models that have been covered above. Kellogg's model (see Fig. 5) includes the three subprocesses of planning (i.e., generating, organizing, and goal-setting) from Flower and Hayes's model and the knowledge-telling and transforming from Scardamalia and Bereiter's models. The model, as it shows, is additive in terms of the number of process spaces it encompasses; that is, it incorporates, in addition, the processes of collecting, which refers to the writer's library skills, attention allocation, and the working memory. It is important to mention that the previous models address these extensions, but they did not mount enough to be formally considered in the final version of the model.

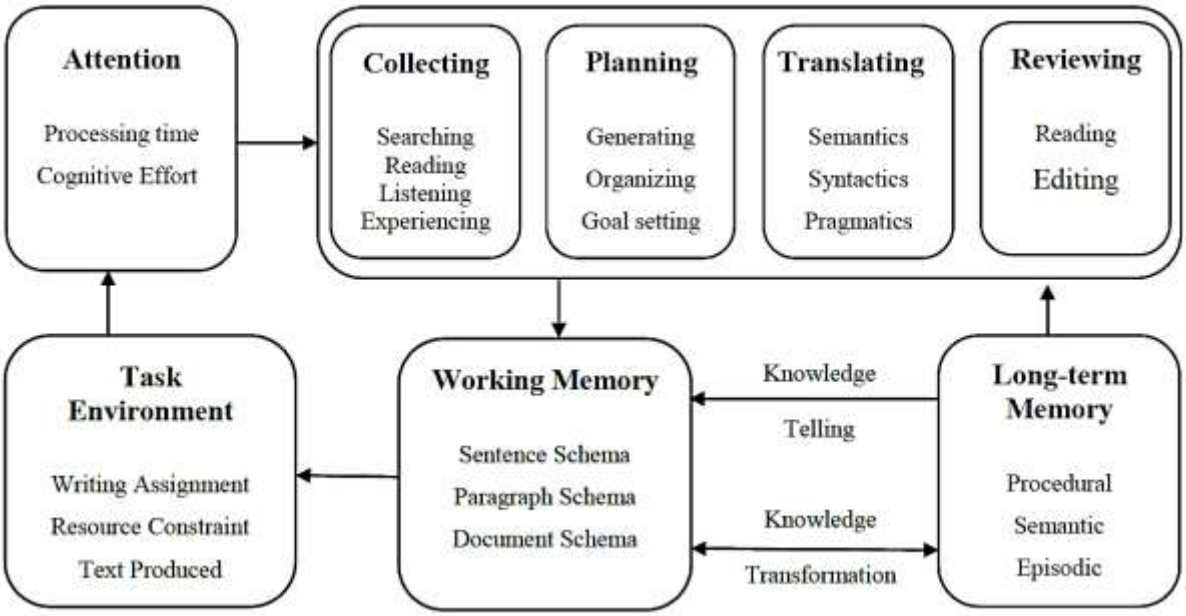

Figure 5. Kellogg's model of the writing process (Source: Kellogg 1994, p. 26)

Conceptualization of the planning component in this model is more or less indistinguishable from Flower and Hayes's as the three processes of generating, organizing, and goal-setting serve the same functions in the episode of planning.

2.4 Writing Self-Efficacy and Writing Performance

This section will focus on defining writing self-efficacy as it is described in relevant literature, and on examining the mediational role of self-efficacy beliefs in relation to writing performance.

2.4.1 Operationalization of Writing Self-Efficacy

Bandura (1997) provided clear guidelines concerning the way self-efficacy beliefs should be operationalized and assessed. The major criteria to construct valid and reliable self-efficacy assessment scales are *specificity* and *correspondence* (Pajares, 1996; Pajares, Hartley, & Valiante, 2001). 'Specificity' refers to the task-specificity of self-efficacy beliefs in that the scale items must reflect the various dimensions of the construct and be formulated in terms of 'can do', which is a judgment of capability. 'Correspondence' pertains, on the other hand, to the consistent reflection of the criterial specifications of the task demands in the assessment scale. A self-efficacy scale assessment that tries to tap, for example, students' beliefs of confidence to solve division problems in math should reflect what it takes to accomplish the task as well as the impediments that may interfere with performance.

Concerning writing self-efficacy, several studies have already done by especially Frank Pajares and colleagues in relation to writing performance. Writing self-efficacy is operationalized in the literature as "students' judgments of their confidence that they possess various composition grammar, usage, and mechanical skills appropriate to their academic level" (Pajares, Miller, & Johnson, 1999, p. 10).

2.4.2 The Mediational Role of Writing Self-Efficacy

The mediational role of self-efficacy has been the objective of several studies in writing and other fields. In what follows is a report of some of the relevant studies.

Zimmerman, Bandura, and Pons (1992) conducted a study on the causal role of self-efficacy for self-regulated learning and achievement goals. A sample of 116 9th and 10th graders responded to a questionnaire in the beginning of the semester that tapped their self-efficacy for self-regulated learning and personal goal-setting. The results showed that thanks to their high sense of self-efficacy, some students set higher achievement goals for themselves that they achieved at the end of the semester. Students' self-efficacy for academic achievement correlated significantly with their self-set grade goals. In a similar study, Zimmerman and Bandura (1994) studied the role of self-regulatory self-efficacy and writing achievement. The results showed that perceived academic self-efficacy beliefs significantly correlated with writing achievement both directly and indirectly.

In another line of research, Pajares and Johnson (1994) investigated the relationships among students' outcome expectations, writing self-efficacy, writing apprehension, and general confidence in relation to writing performance. The study reported significant direct relationship between self-efficacy and writing performance. More importantly, the multiple regression analysis showed that writing self-efficacy mediated the impact of outcome expectations and writing performance. In a subsequent study on the mediational influence of writing self-efficacy on writing performance, Pajares and Johnson (1996) did a study to test the influence of writing self-efficacy, aptitude, and writing apprehension on essay-writing performance. Students' perceptions of their writing self-efficacy were tapped using a questionnaire while writing aptitude assessment consisted of teachers' ratings of students' writing aptitude plus students' scores on a statewide assessment of writing aptitude. The study reported a strong relationship between self-efficacy and writing performance (.60). Self-efficacy mediated largely the strong effect of aptitude on writing performance.

To further explore the mediational role of writing self-efficacy. Pajares and Valiante (1997) conducted a study on the influence of writing self-efficacy, writing aptitude, perceived usefulness, and writing apprehension on writing performance of elementary students using a path analysis. Adding further corroboration to the mediational role of writing self-efficacy to previous studies, the results demonstrated an independent contribution of writing self-efficacy to students' writing performance ($\beta = .356$). Self-efficacy also mediated the effect of writing aptitude on writing performance.

In light of the above results, Pajares, Miller and Johnson (1999) explored gender differences in self-efficacy for self-regulation in writing. A sample of 363 students (174 girls and 189 boys) participated in the study. During the first class period, students completed a self-efficacy questionnaire. In the second class period, they were asked to write a 30-minute essay. The results of the multiple regression analysis showed an independent contribution to writing performance ($\beta = .397$). Also, the path analysis revealed that self-efficacy mediated the strong influence of aptitude on writing performance ($\beta = .380$).

All the above studies show explicitly that self-efficacy beliefs have a strong influence on writing performance. They also attest to the mediational role of writing self-efficacy between variables such as aptitude and perceived usefulness of writing on writing performance.

3. Methodology

3.1 Research Design

In educational research, the effect of instruction in metacognitive strategy awareness is often measured through experimental designs. Typically, the experimental group receives specific training, while the control group does not. By comparing pre- and post-test scores of both groups, researchers can determine the extent to which differences in performance can be attributed to the treatment, rather than to extraneous variables. This study utilized an experimental design to explore the mediating role of writing self-efficacy in the relationship between metacognitive strategy training for planning composition writing and overall performance in argumentative essay writing. Notably, this study was a quasi-experiment, as the subjects were not randomly assigned to groups.

3.2 The Sample

The sample for the present study included a total of 41 high school baccalaureate students, aged 17 to 20. They belonged to two separate classes. One class served as the control group with 15 students, while the other class was divided into two experimental groups. The first experimental group consisted of 12 students, and the second experimental group comprised 14 students.

The two experimental groups were dichotomized using the median split method according to their level of self-efficacy indexed by a literature-based writing self-efficacy point-scale questionnaire. The questionnaire was adapted from previous researchers (Pajares & Johnson, 1994; Pajares & Valiante, 2001; Pajares, Miller, Johnson, 1999) who used the ten-item scale to tap students' writing self-efficacy in relation to the various components of the writing skills. The questionnaire items were piloted for clarity prior to administration. The ten-item self-efficacy scale ranges from 0 to 1000 points. Students scoring below 500 were classified as having low self-efficacy and coded as 2 in the data. Those scoring above 500 were classified as having high self-efficacy and coded as 1. Table 1 shows the distribution of subjects across these groups.

Table 1
Distribution of subjects among the different groups

Groups	Self-efficacy Level	Females	Males	Total
1st Experimental Group	1	1	11	12
2nd Experimental Group	2	1	13	14
Control group	-	1	14	15
TOTAL	41			

3.3 Comparability of the study groups

As with any experimental study, efforts were made to ensure that the experimental and control groups were comparable in terms of their performance on the dependent variable and that all the factors that could potentially interfere with the study's results were controlled. A series of statistical tests were run to establish the baseline among the three groups of subjects.

3.3.1 Levene's Test

Prior to the treatment implementation, the three groups took a pre-test on an argumentative writing task, with their essays scored by two raters. To ensure the groups were equal in performance, a Levene's test was conducted to assess the homogeneity of variances. The results, shown in Table 2, indicated that the groups were not equal, as the significance value was below .05 (Sig. < .008).

Table 2
Test of Homogeneity of Variances of Pre-test scores

Levene Statistic	df1	df2	Sig.
4,845	2	38	.008

To address the problem of inequality in group variances, the extreme cases in the student-writers' scores (ranging from 02 to 06 out of 20) were removed, reducing the number of subjects in each group. Initially, the first experimental group had 13 subjects, the second experimental group had 18 subjects, and the control group had 19 subjects. After removing the extreme scores, another Levene's test was conducted to determine whether the groups were now equal.

Table 3
Second Test of Homogeneity of Variances of Pre-test scores

Levene Statistic	df1	df2	Sig.
,658	2	38	.524

After the removal of extreme scores, a second Levene's test was conducted, which showed that the three groups were now equal in terms of their variances, as indicated (see Table 3) by a significance value greater than .05 (Sig. > .524).

3.3.2 Analysis of Variance

With the assumption of homogeneity fulfilled, an ANOVA analysis was conducted to further ensure that the groups' means were equal. Table 4 presents the descriptive statistics of the three groups' pre-test scores.

Table 4
Descriptives of the Pre-Test ANOVA of the Three Groups' Scores

Groups	N	Mean	SD	Min	Max
1st Experimental Group	12	9,87	1,93	7.00	12,00
2nd Experimental Group	14	9,85	1,65	7.00	12,00
Control Group	15	9,66	1,44	7.00	12,00
Total	41	9,79	1,63	7.00	12,00

* p< 0.01 (2-tailed).

The ANOVA results clearly indicated that the mean values of the three groups were not significantly different from one another (Means: 9.87, 9.85, and 9.66). The standard deviations also revealed that the within-group variability was very low across all three groups (SDs: 1.93, 1.65, and 1.44). Regarding essay scores, the last two columns show that the maximum and minimum scores across all groups were 12 and 7, respectively. The second output displays the ANOVA table, which compares the means of the groups' pre-tests.

Table 5.
ANOVA of the Pre-Test Scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,378	2	,189	,068	.935
Within Groups	106,110	38	2,792		
Total	106,488	40			

The ANOVA results (Table 5) indicated that the three groups had no significant difference in their mean scores on the pre-test ($F(2,38) = 0.68$, $p > .05$). Hence, based on this analysis, it could be concluded that the three groups had equal performance levels on the pre-test considering that a non-significant p-value was found which indicated that the variation between groups was not statistically meaningful. The study's internal validity was therefore reinforced pointing out that variations noted post-treatment are more likely connected to experimental situations rather than initial disparities between writing abilities of the groups.

3.4 The Treatment

3.4.1 The training program

The treatment of the study included a training on the use of five planning strategies, namely brainstorming, semantic mapping, outlining, organizing, and audience-and-use analysis. On the basis of the writing models discussed in the review of the literature, the planning stage was broken down into idea generating, organizing, and goal-setting. Brainstorming and semantic mapping were then two idea generation strategies, while outlining was an organizing strategy and audience-and-use analysis was a goal-setting strategy. Efforts were made to include strategies for each subprocess of the holistic planning process. The selection of these strategies was based on the effectiveness criterion. Research has shown that brainstorming, semantic mapping, and outlining were found to be effective planning strategies in increasing the number of ideas generated and enhancing the overall quality of the final product (Kellogg, 1994). Training in the audience-and-use analysis strategy was also found to help student writers to adapt their written discourse to different audiences, from highly technical to completely non-technical audience (Ching, 2002).

3.4.2 The metacognitive strategy training model

The model for teaching the above strategies was developed on the basis of the guidelines of Oxford (1990), Wenden (1991) and Jones et al. (1987, as cited in Wenden, 1991). The model comprises six main stages.

3.4.2.1 Strategy use assessment

The first step in the model emphasizes that the target strategy should be assessed before it is modelled to the subjects. Two assessment tools were used in the study: note-taking and interviewing. The first training session, students were asked to take notes on all the activities they engage in before starting to write. Following this, they participated in an unstructured class interview to obtain more in-depth assessment data.

3.4.2.2 Explanation of the strategy

After the assessment, the teacher introduced the strategy by naming it and instructing the students on how to use it step-by-step. During this phase, the knowledge the student writers received was mainly declarative and conditional. The explanation of the strategy focused on describing its characteristics, its usefulness, and the specific contexts in which it should be applied, including when, where, and how to implement it effectively.

3.4.2.3 Modelling the strategy

At this stage, the teacher modeled and demonstrated the use of the strategy. Crucially, the teacher verbalized their thought processes throughout the demonstration to help student writers understand the essential steps involved in employing the strategy.

3.4.2.4 Scaffolding the instruction

After the teacher had modeled the strategy and demonstrated its application to the student writers, it was time for the students to practice using the strategy. Periodically, the teacher moved around to provide monitoring support to the student writers. The

teacher continued to scaffold the strategy until the students demonstrated that they could apply it independently. This gradual reduction of support was a deliberate strategy to foster the autonomous use of the strategy by the students.

3.4.2.5 Developing motivation

At this critical phase, the teacher focused on providing student writers with successful experiences in applying the strategy. This primarily involved assigning relatively easy tasks related to each strategy. The teacher intentionally connected the students' successful performance to the use of the strategy being studied, aiming to motivate them and demonstrate the tangible benefits of the strategy.

3.4.2.6 Evaluating the strategy training

The final step in the model focused on evaluating the effectiveness of the strategy training. This evaluation was conducted through feedback sessions at the end of each training session and follow-up discussions. The primary goal of this evaluation was to encourage student writers to reflect on the strategy they had been practicing, thereby fostering a deeper understanding and thorough processing of the strategy.

This model was meticulously followed in implementing the treatment over a two-week period. The first and sixth sessions were dedicated to the pre- and post-assessment of the writing performance of both the experimental and control groups. The treatment implementation schedule is outlined below.

Table 6.
The treatment implementation schedule

Sessions	Lessons	Planning Strategy	Timing
Session 1	Pre-test administration		1h30
Session 2	Lesson 1	Introduction to argumentative writing	30 min
		Brainstorming	1h30
Session 3	Lesson 2	Semantic mapping	2 hours
Session 4	Lesson 3	Outlining & organizing	2 hours
Session 5	Lesson 4	Audience-and-use analysis	2 hours
Session 6	Post-Test administration		1h30

All the writing prompts during the practice stage were focused on topics related to for-and-against issues, aiming to contextualize the strategy within argumentative writing.

4. Results and Discussion

4.1 Results

4.1.1 Inter-Rater Variability

To enhance the internal reliability of the experiment, an inter-rater reliability analysis was conducted on the scores given by the two raters for both the pre-test and the post-test. This analysis was performed using the SPSS correlation analysis statistical tool. The table below summarizes the correlations.

Table 7
Descriptive Statistics of the Raters' Pre- and Post-test Scores Correlations

Raters	Tests	Mean	Std. Deviation	N
Rater I	Pre-test	9,75	1,17	41
	Post-test	10,25	1,63	41
Rater II	Pre-test	9,79	1,68	41
	Post-test	10,42	1,48	41

This table summarizes the means and the standard deviations of the pre- and the post-test scores by the two raters. It is noticeable that there seems to be no gapping difference between the means of the raters' score sets on both the pre- and the post-tests.

Table 8
Raters' Pre- and Post-test Scores Correlations

	1	2	3	4
1st rater pre-test	1			
2nd rater pre-test	.66**	1		
1st rater post-test	--	--	1	
2nd rater post-test	--	--	.70**	1

** p< 0.01 (2-tailed).

As can be seen in Table 8, the two raters' pre-test score sets correlate consistently. The correlation coefficient obtained is r = .66, indicating a positive correlation between the two raters' evaluations of the student-writers' essays on the pre-test. Similarly, the correlation between the post-test scores given by the two raters is also significant, with a correlation coefficient of r = .70.

4.1.2 ANOVA of the Three Groups' Post-test Scores

So far all the analyses were run to ensure that the three groups are equal in so far as their writing performance is concerned as well as to demonstrate through correlational analysis that the student-writer's essay-writing performance does not vary as a function of rater change. What follows then after establishing the baseline is an analysis of the three groups' scores on the post-test to determine whether differences exist in their performance or not and eventually whether the treatment had any effect on the experimental groups or not.

Table 10
ANOVA of the Post-Test Scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32,784	2	16,392	7,711	**.002**
Within Groups	80,777	38	2,126		
Total	113,561	40			

*p< .05

The high F-ratio value of 7.711 indicates a significance value of less than 0.05. This reveals a significant difference among the means of the three groups. The analysis of variance shows that the groups did not perform equally on the post-test, F (2, 38) = 7.711, p < 0.05. Therefore, we can conclude that there is a significant difference between the groups, necessitating post hoc comparisons to determine which group means differ significantly.

Table 11
Tukey HSD Post Hoc Tests

(I) Group	(J) Group	Mean Difference (I-J)	Sig.
1	2	1,3988	.050
	3	2,2083*	**.001**
2	1	-1,3988	.050
	3	,8095	.305
3	1	-2,2083*	**.001**
	2	-,8095	.305

* p < .05

This table presents the pairwise comparisons of the three group means. There is a significant difference between the first experimental group and the control group ($p < 0.05$). However, the mean difference between the first and second experimental groups is not significant ($p > 0.05$). Similarly, the difference between the means of the second experimental group and the control group is slight and not statistically significant ($p > 0.05$). Thus, we can conclude that the first experimental group scored higher ($M = 11.54$) on the post-test than both the second experimental group ($M = 10.14$) and the control group ($M = 9.30$).

4.1.3 T-test of the Two Experimental Groups Post-test Scores

After demonstrating that the first experimental group outperformed the second and control groups, an Independent Sample t-test was conducted to determine the effectiveness of the treatment in relation to their self-efficacy levels by comparing the means of the two experimental groups on the post-test.

Table 12
T-test on the Post-test Scores of the Two Experimental Groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
POST-TEST	Equal variances assumed	1,363	,254	2,47	24	.021	1,39	,56465	,23343	2,56419
	Equal variances not assumed			2,40	19,067	.026	1,39	,58112	,18279	2,61483

The table above presents the t-test analysis of the post-test scores for both the first and second experimental groups. The objective is to evaluate the effectiveness of the treatment in relation to the students' perceived self-efficacy. The first part of the SPSS output displays the result of Levene's test, indicating that the performance of the two groups on the post-test is relatively consistent ($Sig. > 0.05$). This finding is supported by the t-value, which is not significant ($t = 2.47$, $df = 24$, $p > 0.05$). Therefore, we can conclude that despite their differing levels of self-efficacy, the experimental groups showed comparable improvement on the post-test.

Table 13
One Sample T-Tests of the Scores of the Three Groups

	Mean	t-value	Sig. (2-tailed)
1st Experimental Group	11,54	3,14	**.009**
2nd Experimental Group	10,60	1,87	.083
Control Group	09,33	-1,72	.106

* p< 0.05 (2-tailed).

The table above presents the results of the t-tests on the pre-test and post-test scores of the three groups. For the first experimental group, the mean difference between the pre-test and post-test scores is significant ($t = 3.14$, $df = 11$, $p < 0.05$). This indicates a significant improvement in their writing performance from the pre-test to the post-test.

In contrast, the table shows that the writing performance of both the second experimental group and the control group did not change significantly between the pre-test and the post-test. The second experimental group's significance value is not far beyond the threshold ($p > 0.05$), suggesting some improvement, albeit not statistically significant. The control group, however, appears to have experienced a decline in writing performance, as indicated by the negative t-value ($t = -1.72$).

In summary, the first experimental group showed significant improvement in writing performance, while the second experimental group showed non-significant improvement, and the control group showed a decline.

4.2 Discussion

4.2.1 The first experimental group

The first experimental group, coded in the data as having high self-efficacy, showed significant improvement on the post-treatment test. The writing performance of this group was significantly different. An analysis of the scores for each subject shows that all subjects, without exception, displayed grade progress on the post-test. These findings strongly suggest that this group benefited from the treatment it received and that the treatment was effective in enhancing their argumentative essay-writing performance.

Analysis of the post-test essays revealed clear differences compared to the pre-test essays in several respects. First, the post-test essays exhibited greater fluency, as evidenced by the significantly higher word count in the majority of the essays compared to the pre-test essays. This suggests the effectiveness of the pre-writing strategies practiced as part of the treatment.

Second, as far as the argumentative organizational plans are concerned, all the essays, without exception, conformed to the patterns taught in the treatment. It is noteworthy to mention here that all the students preferred Pattern A (introduction/thesis/arguments/refutation of anti-thesis/conclusion) to Pattern B (introduction/counter-argument 1/refutation/counter-argument 2/refutation/ counter-argument 3/refutation, etc./conclusion). The reason behind this may be that Pattern B calls for more cognitive engagement and understanding of the reader's opponent arguments. They all opted for the first pattern to organize their essays and left the refutation move till the penultimate paragraph.

Overall, in light of these findings it can be safely concluded that this group of subjects improved their performance in argumentative writing. The treatment seems to be the responsible variable for this improvement, if we take into account its effects on the student-writers' post-test written productions. Improvement in word fluency, better organization, and instances of audience awareness all attest to the effectiveness of the treatment.

4.2.2 The second experimental group

The subjects of this group were differentiated from the first group on the basis of their low self-efficacy as opposed to the high self-efficacy of the first group. The t-test analysis of the pre- and post-test scores of this group did not show a significant difference. Although the t-test showed no significant difference between their performance on the pre- and the post-tests, the analysis of variance showed that there is a slight mean improvement (X: 9,85 to X: 10,14). Pairwise comparisons of each student-writer's scores on both the pre- and the post-tests led to the conclusion that some subjects improved their performance on the post-test and this was attributed to the slight mean rise.

Analysis of the essays of this group revealed significant differences in some students' writing performance on the post-treatment test. These differences manifested themselves in the overall organization which conformed to the organizational pattern A. These students also showed cases of audience awareness and more word fluency. The other students did not seem to have improved much.

The findings of the writing performance analysis of this group suggest that some subjects (8 out of 14) displayed some improvement on the post-treatment test, although they had a low level of self-efficacy – a finding contrary to the expectations.

4.2.3 The control group

This group was the group that received no treatment and served as the control group in the experiment. The t-test analysis of the scores obtained on the pre- and the post-tests revealed that there is no significant difference ($t= -1,27$, $df=14$, $p>0.5$). The group means further corroborated this finding (pre-test X: 9,66; post-test X: 9,66). Additionally, the essays of these student-writers showed a complete absence of the any of the two classical organizational plans of argumentative writing. The typical essay organization consisted of an introduction in most cases, a one-paragraph body, and a conclusion that was sometimes neglected in some essays. Concerning the audience, all the essays lacked a direct appeal to the reader. The whole writing was a sort of listing of personal ideas rather than arguments addressed to a specific audience. In so far as word fluency is concerned, there seemed to be no significant numerical difference. Counting the words in two randomly chosen essays, it was found that there was no significant mean difference. The findings suggest that the writing performance of the control group remained consistent on the two tests and there was no improvement.

4.2.4 Limitations of the study

Like any research study, this study has certain limitations. The first limitation of the study is its small sample size. Running the same experiment with a large sample would have been more enlightening. Using the actual size was, however, instrumental in obtaining a snapshot of what goes on in the writers' minds as they acquire and apply writing strategies. Statistically speaking, no attempt was made in the analysis of the data to make any direct causal relationships among the variables. Such causal relationships could be established using more sophisticated statistical analyses such as path analysis which was not possible in the present study given the small sample size and the few variables manipulated. T-test and ANOVA data analytic tools were, however, adequate to get answers to the study's questions.

4.3 Variables Analysis

4.3.1 Metacognitive strategy training

This study aimed to evaluate the effectiveness of instruction in metacognitive strategy use for planning argumentative writing. The experimental treatment involved training student-writers in these strategies. The findings strongly support the effectiveness of this approach, aligning with previous research (Ching, 2002; Kasper, 1997).

The first experimental group showed significant improvement on the post-test, attributable to the treatment. Most of the second experimental group also improved, while the control group, which did not receive the training, showed no gains. These results suggest that raising students' awareness of declarative, conditional, and procedural knowledge positively impacts their future application of these skills.

These findings are consistent with those of Ching (2002), who found that metacognitive strategy training improved the overall quality of students' compositions. In conclusion, metacognitive strategy training effectively enhanced students' essay-writing performance.

4.3.2 The mediational role of self-efficacy

The study also aimed to investigate the mediational role of writing self-efficacy beliefs. As discussed in the literature review, writing self-efficacy has been shown to mediate the effects of various factors, such as aptitude and outcome expectations, on writing performance. This study provides further evidence for this mediational role.

The first experimental group, consisting of individuals with high self-efficacy, displayed significant improvement in writing performance on the post-treatment test compared to their initial test. Notably, a majority of the second experimental group (8 out of 14) showed improvement in writing performance despite having low self-efficacy. Using repeated measures, the self-efficacy questionnaire was re-administered to the second experimental group after the treatment. It was found that 8 out of 14 student-writers increased their self-efficacy during the treatment period. The number of student-writers with high self-efficacy increased significantly (from 6 to 20) using the same median split method.

The improvement in self-efficacy of the second experimental group explains their enhanced writing performance on the post-test. Training in metacognitive strategy use not only improved their writing performance but also developed their self-efficacy in writing through the provision of scaffolding and motivation that was part of the metacognitive strategy training model followed during the treatment.

In line with previous research, the study's findings strongly suggest that self-efficacy independently contributes to writing performance, confirming the results of several studies cited in the literature (Pajares & Johnson, 1994, 1996; Pajares & Valiante, 1997; Pajares, Miller, & Johnson, 1999). The increase in self-efficacy among experimental subjects is consistent with Ching's (2002) findings.

Overall, the study's results indicated that metacognitive strategy training was effective in developing student-writers' strategies and that this effectiveness was mediated by their perceived self-efficacy beliefs.

4.4 Research Hypotheses and Questions

4.4.1 Research Questions:

1. **Does metacognitive strategy training enhance essay-writing performance?**
   - The study's findings indicated that metacognitive strategy training effectively enhances essay-writing performance.
2. **What mediational influence, if any, do writing self-efficacy beliefs have on the improvement of writing ability?**
   - The results showed that writing self-efficacy mediated the relationship between metacognitive strategy training and writing performance.

4.4.2 Hypotheses and answers:

1. **Hypothesis 1: Metacognitive strategy training is effective in enhancing essay-writing performance.**
   - The findings confirmed this hypothesis, as the training significantly improved essay-writing performance.
2. **Hypothesis 2: Experimental student-writers with high self-efficacy will achieve better scores on the post-treatment test than those with low self-efficacy.**
   - This hypothesis was supported. The first experimental group, with high self-efficacy, outperformed the second experimental group, which had low self-efficacy, demonstrating the mediational role of self-efficacy.
3. **Hypothesis 3: The two experimental groups will achieve consistent scores on the post-treatment test regardless of their level of self-efficacy.**
   - This hypothesis was rejected based on the results, which showed differing performance levels between the groups.
4. **Hypothesis 4: Experimental student-writers with low self-efficacy will achieve better scores on the post-treatment test than those with high self-efficacy.**
   - Since Hypothesis 2 was supported, this hypothesis was automatically rejected. The first experimental group, with high self-efficacy, performed better than the second experimental group with low self-efficacy.

5. Conclusion

The findings of the present study indicate that instruction in metacognitive strategies significantly improved students' writing performance. Students would benefit a lot from the provision of procedural knowledge of various writing strategies, beyond just declarative knowledge. Demonstrating the application of each strategy can help students effectively imitate and acquire these skills.

Additionally, training in invention strategies during the planning stage increased word fluency and improved organization. Teachers need to emphasize this critical phase, as effective planning and organization are key to successful writing.

Self-efficacy was found to mediate the impact of metacognitive strategy training on writing performance. Therefore, It is advisable for teachers to prioritize socio-affective aspects by consistently offering positive feedback to enhance students' confidence and motivation. Cognitive training alone is not enough; fostering personal confidence through supportive feedback is crucial for improving writing skills. Finally, incorporating a metacognitive strategy training guide within the writing syllabus can promote autonomous learning and further support students' development of writing skills.

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