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# The Synergistic Influence of Thinking Styles and Metacognitive Knowledge on EFL Learners' Written Production

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**Abstract**

Writing is a cognitive task that reflects the writer's thought; it is a productive skill granting the learners of English as a foreign language (EFL) the opportunity to display their linguistic knowledge and convey their ideas. However, the students think differently which leads them to adopt distinct ways for generating a written product. Therefore, the present study attempts to explore the influence of exploiting different knowledge processing approaches on EFL learners' writing performance taking into consideration the synergistic function of the students' awareness and thinking styles in written production. To achieve such an objective, the studied case revolved around a sample of 40 third year EFL learners studying at the English department at Tlemcen University. The research instruments included two tests and follow-up questionnaires. The collected data were analyzed quantitatively and qualitatively. The research findings have elicited that the students' writing performance fluctuates depending on the level of thought assessed in the given tasks leading to the conclusion that the quality of the written output is largely determined by the adopted type of thinking style which is closely associated with the learners' awareness of their personal knowledge and abilities.

**Keywords:** writing – learners – thinking styles – awareness

## İngilizceyi Yabanci Dil Olarak Öğrenen Öğrencilerin Yazılı Metinlerindeki Üstbilişsel ve Düşünme Stillerin Sinerjistik Etkisi

**Özet**

Yazma, yazarların düşüncelerini yansıtan bilişsel bir beceridir. İngilizceyi yabancı dil olarak öğrenen öğrencilerin fikirlerini iletmek ve dilsel bilgilerini göstermek için bu beceriye ihtiyacı vardır. Ancak, öğrenciler birbirlerinden farklı düşünürler. Bu nedenle, her öğrenci yazılı metin üretmek için bir düşünme tarzını benimser. Bu makalede, İngilizceyi yabancı dil olarak öğrenen öğrencilerin farklı bilgi-işlem yaklaşımlarını benimsemelerinin yazma performanslarına etkisi incelenmiştir. Bu hususta öğrencilerin farkındalıkları ve düşünme stillerinin sinerjistik işlevleri dikkate alınmıştır. Bu amaca ulaşmak için vaka çalışması kullanılmıştır. Örneklem, Tlemsen Üniversitesi İngilizce Bölümü üçüncü sınıfta okuyan 40 öğrenciden oluşmaktadır. Araştırma araçları olarak iki test ve bir anketten yararlanılmaktadır. Toplanan veriler nicelik ve nitelik olarak analiz edilmiştir. Çalışmadan elde edilen sonuçlar ışığında yazma becerisinde düşünme şekillerine bağlı olarak öğrencilerin performanslarının değişimi belirlenmiştir. Bu nedenle, üretilen kompozisyon kalitesinde farklı düşünme tarzının benimsemesinin büyük etkisi olduğu gözlenmiştir. Ayrıca, düşünme stilleri ile öğrencilerin kişisel bilgi ve yeteneklerinin farkındalığı arasındaki ilişki vurgulanmıştır.

**Anahtar kelimeler**: yazma – öğrenciler - düşünme stilleri - farkındalık

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## Introduction

Writing is a language skill that has to be successfully manipulated by EFL learners in order to achieve effective communicative purposes. It reflects individual ways of thinking displayed in the use of distinct compositional styles resulting in different writing performance levels. Accordingly, the present study tries to highlight the influence of the students' awareness and knowledge processing approaches on the quality of their written productions. It embodies a theoretical and practical part; the practical phase will be described in the upcoming sections, but before doing so, it is necessary to provide a theoretical overview of written composition and its instruction.

In fact, writing constitutes a problem solving task achieved through recursive processes (Hyland 2011: 18). Additionally, written production entails working memory processes that enable the writer to handle issues related to the generation of ideas and rhetorical matters (Kellogg 2008: 02). It is a skill that is taught using different instructional methodologies. Indeed, the teaching of composition is based on the use of different methods including the product and the process approaches that may be applied separately or may be combined together depending on the teachers' objectives. The product approach which hinges on the rules of current-traditional rhetoric represents a non-social perspective; it gives importance to the final written product taking into consideration its readability and grammatical correctness; it advocates the use of tasks that urge the learners to expand statements, write sentences and produce pieces of discourse (Nunan 1989: 36).

The process approaches are linked to five main orientations that are referred to as the expressive, cognitive, dramatistic, tagnemic and social perspective. The cognitive view claims that writing goes through three stages including planning, translating and reviewing (Flower & Hayes 1981: 375). The expressive perspective that is also called prewriting is based on the assumption that invention is a means of revealing the writer's linguistic potential (Dyer 1990: 100); the tagnemic view considers writing as a process of discovery resulting from the writer's manipulation of a set of inventional strategies leading to knowledge construction via questioning, exploration and imagination (Lauer 2004: 80). The dramatistic perspective sees writing as a sort of invention using heuristic techniques. The social view regards writing as a social creative product (Dyer 1990: 100). In reality, the process approach is concerned with the strategies used by the writer to produce composition (Nunan 1989: 36).

In addition to the product and process approaches, writing instruction may also involve the genre-based approach which hinges on the principles of various perspectives including the assumptions of English for specific purposes (ESP) and systemic functional linguistics as well as the principles of new rhetoric (Flowerdew 2012: 86). Moreover, the process-genre approach which represents a combination of the process-oriented and genre-based paradigm may constitute an effective way of teaching written composition (Wang 2009: 91). Therefore, different perspectives

shape writing instruction. However, the process approach seems to be the most prominent methodology. The latter focuses on the cognitive and mental aspects of composition. This view is tightly linked to the fact that written production constitutes a graphic representation of one's thought. Hence, the writer's compositional style represents a reflection of his/her thinking mode. This idea is elaborated in the subsequent title.

**Writing and Thinking Styles**

The process of written composition depends on the writer's conceptual, sociocultural and metacognitive knowledge. Conceptual knowledge embodies the writer's topical and linguistic knowledge. The sociocultural one entails the individual perception of the social context. The writer's awareness of the audience stems from the mixture of conceptual and sociocultural knowledge (Kellogg 1994: 49). Metacognitive knowledge comprises the personal awareness of one's abilities, assets and strategies required for the fulfilment of a specific assignment (Baker 2013: 419).

In fact, linguistic knowledge determines the quality of the written output; it is activated throughout the different writing phases. In the prewriting stage, writers are more concerned with idea generation involving words or phrases. This planning phase relies on the use of sentence fragments rather than full utterances (Blass & Gordon 2010: 2). The logical organization of the produced sentences results in a piece of discourse. Thus, the writer should pay attention to vocabulary, mechanics, grammar and the content of the written utterances. The production of written discourse requires the ability to integrate meaningful ideas into a well-structured form taking into consideration the coherence and cohesion of the produced text (Nunan 1989: 36).

In reality, the mastery of the writing skill hinges on the writer's successful manipulation of linguistic knowledge that is reflected in the adequate word choice and appropriate discourse structure. Moreover, the content of the written product is important because it reflects topical knowledge which is related to the writer's thought. Hence, thinking and writing are interrelated since the latter is a means of expressing the former. In fact, thinking is classified into two categories; the first type is procedural as it concerns the procedures and the ways of processing data and performing tasks. The second one is substantive since it turns around the quality of the ideas or the content. The blending of these modes of handling thought results in reflective thinking which is subdivided into self-corrective, metacognitive and recursive thought (Lipman 2003: 27). Actually, two types of thinking styles are discerned: reproductive and productive. Reproductive thinking which is also called the imitative style stipulates lower order levels of thought. However, productive thinking represents a creative mode of reflection that depends on higher order levels of thinking (Bright 2013: 74). It can be demonstrated in a set of criteria involving fluency which denotes the abundance of ideas, flexibility that implies the variety of information, originality embodied in the provision of innovative thought and elaboration which means developing the given ideas through details (Starko 2010: 128).

Indeed, writers are thinkers whose ideas are conveyed in a written form. They manipulate reproductive and productive styles of thought in writing. Nevertheless, these two manners of thoughtfulness are designated by different terms in the written composition research literature. In fact, there is a distinction between the high-road thinker and the low-toad thinker. The low road is a direct progressive manner of generating texts without giving importance to goal setting; the high road entails dialectical thinking involving analysis and evaluation (Bereiter & Scardamalia 1987: 258). These two styles of thinking denote two distinct approaches of information processing while generating written composition. The low road represents the knowledge telling strategy while the high road constitutes the knowledge transforming approach (Johnson 2005: 18). These two approaches to knowledge processing are highly influenced by metacognition (McCormik 2003: 87).

In fact, the knowledge telling approach focuses on lower-order thinking skills involving recall and comprehension. On the other hand, knowledge transforming concerns higher-order thinking skills including analysis, synthesis and evaluation (Tynjâlâ 2001: 43). It embodies the construction of innovative ideas resulting from the accumulated input (Scardalamia & Bereiter 1987: 171). It implies the production of written discourse through problem solving, planning and monitoring (McCormick 2003: 87). Accordingly, knowledge tellers regurgitate the information they have learnt about the discussed subject relying on the Writer-Based style whereas knowledge transformers tend to exploit the Reader-Based strategy as they reflect upon the objectives of generating a written product. Indeed, the Writer- Based prose is a writing style and a way of thinking; it represents an approach denoting the production of knowledge in a written form through the retrieval of information from memory. However, the Reader-Based prose entails the retrieval and organization of ideas taking into consideration the target audience (Flower 1979: 26).

Generally speaking, the development of the writing skill involves three macro-stages: knowledge telling, knowledge transforming and knowledge crafting (Kellogg 2008: 04). Knowledge transforming encompasses knowledge telling (Bereiter & Scardamalia 1987: 350). On the other hand, knowledge crafting reflects expert writers (Kellogg 2008: 07). Consequently, the attainment of expertise in writing is achieved via the writer's shift from a straightforward style to a more sophisticated approach to written composition. Since EFL learners adopt distinct writing styles, they perform differently in written production tasks. This is mainly due to the fact that they have diverse ways of thinking and varying degrees of awareness.

Consequently, this study will shed light on the disparity of the students' writing abilities referring to their consciousness of their potential and strategies as well as the level of thought exercised in this productive skill. It aims at providing more information about such an issue as a way of contributing to scientific investigation relating to written production. In order to investigate the aforementioned issues, the following questions were formulated:

- How does EFL learners' thinking styles variation affect their writing performance?

- What are the linguistic levels that are challenging for the students when altering their manners of thought in written production?

- How does the learners' metacognitive knowledge synergize with their thinking styles in writing?

The researcher has put forward a set of propositions to supply suggested answers to the preceding research questions. The first hypothesis proposes that EFL students' thinking styles variation may affect their writing performance which may tend to be low in thoughtful written production tasks and high in rote writing activities. The second one postulates that some learners may face a greater challenge at discourse level when altering their thinking styles in writing which may prevent them from being creative and becoming skilful writers. The last proposition assumes that metacognitive knowledge may be associated with the type of thinking style which leads the learners' awareness of their own abilities and the tasks constraints to vary depending on the kind of the knowledge processing approach stimulated by the given writing activities. More details about this topic are elicited in the subsequent section that turns around the description of the practical part.

**Methodology**

In order to explore EFL learners' writing performance variation according to their mode of knowledge processing taking into account the function of thinking styles and metacognitive knowledge in shaping the students' approaches to written production, a case study was undertaken. Such a method is very prominent in the domain of educational research since it concerns an in-depth investigation about a particular circumstance (Scott and Morrison, 2006:17). The sample involved 40 EFL learners studying at the department of English at Tlemcen University. A repeated-measures design which is more suitable for the case study method was adopted as it helps to scrutinize experimentally the alteration happening within a single instance (Thomas, 2011: 132). The process of data collection relied on the use of two writing tests and questionnaires as research instruments. The two writing tests aimed at assessing the variation in the learners' writing performance when shifting from low order to high order levels of thinking. The description of the two tests is provided in table 1.

Table 1- Tests characteristics

| | Task1 | | Task2 | | Task3 | | Task4 | |
|---|---|---|---|---|---|---|---|---|
| | Test1 | Test2 | Test1 | Test2 | Test1 | Test2 | Test1 | Test2 |
| Knowledge level assessed | Knowledge | Analysis | Comprehension | Synthesis | Comprehension | Synthesis | Application | Evaluation |
| Task type | Limited production task | | Limited production task | | Limited production task | | Extended production task | |
| Linguistic level involved | Word level | | Phrase level | | Sentence level | | Discourse level | |
| Scoring | 02.5 points | | 02.5 points | | 05 points | | 10 points | |

A 20-point rating scale was used to score each writing test that encompassed four subtests focusing on specific levels of thinking related to different linguistic elements. The content of the first test is illustrated in figure 1.

***I- Identify the words that correspond to the following definitions.***
a- The element that can be measured or observed in a scientific study: .....
b- A group of participants who take part in an investigation: .....
c- The process of applying a theory on a certain case: .....
d- A trait referring to the influence of personal opinions and emotions on one's own discernment and reasoning: .....
e- The act of drawing general conclusions about the target population by making inferences from the research results related to a particular instance: .....

***II- Explain the denotation of the subsequent words using phrases:***
Methodology: .....
Induction: .....
Objectivity: .....
Emancipation: .....
Prudence: .....

***III- Explain the meaning of the following concepts using sentences:***
Empiricism: .....
Curiosity: .....
Replication: .....
.Neutrality: .....
Deconstruction: .....

***IV- Write an essay in which you demonstrate the significance of research in the domain of social sciences.***
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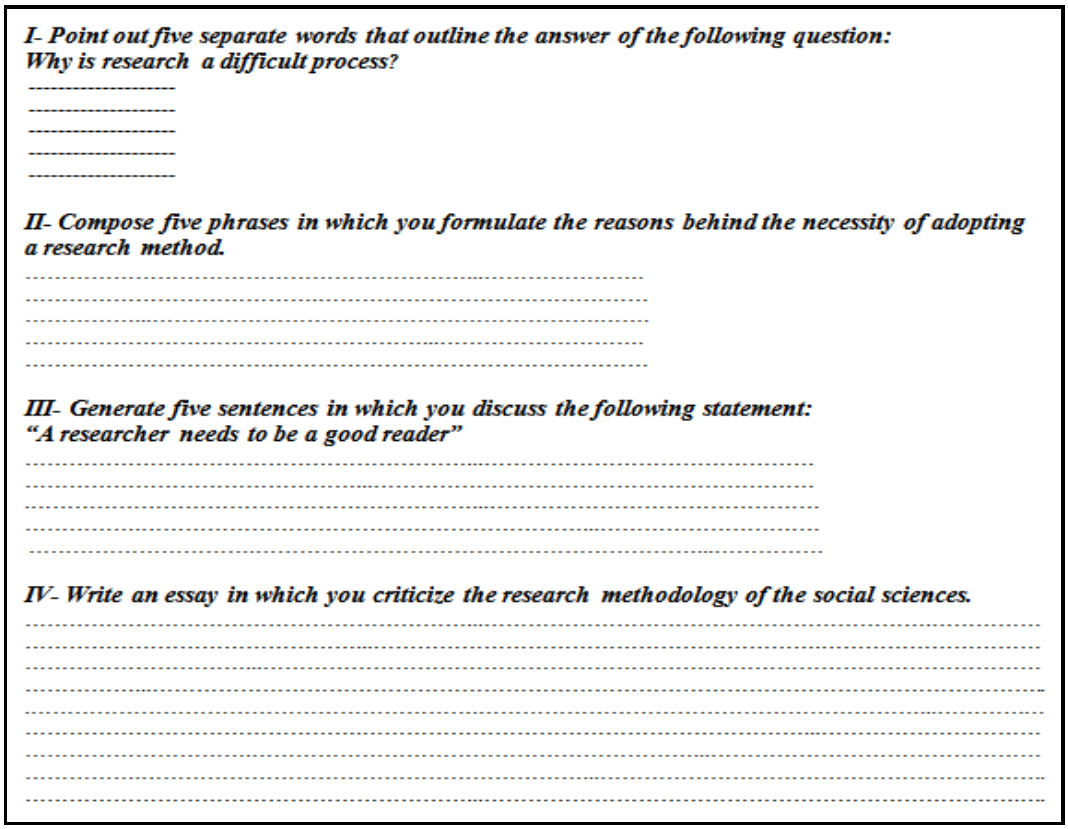
Figure 1- Writing test prompting reproductive thinking

From figure 1, it can be noticed that the first test assessed the learners' writing performance through the use of four tasks requiring limited and extended production based on low order thinking skills. The first activity measured the students' ability to recall some learned words; it dealt with productive vocabulary knowledge. The second and third exercise aimed at testing the learners' degree of comprehension of a set of taught concepts through the production of written phrases and sentences. The last task evaluated the learner application skill via essay writing. The second writing test involved high level thinking skills; its content is elicited in figure 2.


***I- Point out five separate words that outline the answer of the following question:***
***Why is research a difficult process?***

***II- Compose five phrases in which you formulate the reasons behind the necessity of adopting a research method.***

***III- Generate five sentences in which you discuss the following statement:***
***"A researcher needs to be a good reader"***

***IV- Write an essay in which you criticize the research methodology of the social sciences.***

Figure 2- Writing test prompting productive thinking

The second test included four subtests. The first one required the learners to brainstorm and produce a set of words associated to the analysed issue. The second and third task tested the students' ability to synthesize and develop ideas relevant to the discussed topic using phrases and sentences. The last activity assessed the learners' evaluative skill through an essay question.

In addition to the two tests, a follow-up questionnaire was administered after each writing test; it constituted a form of retrospective probing based on the two-wave panel design that aimed at eliciting data concerning the students' manipulation of metacognitive knowledge while writing. The objectives of the follow-up questionnaire are summarized in figure 3.

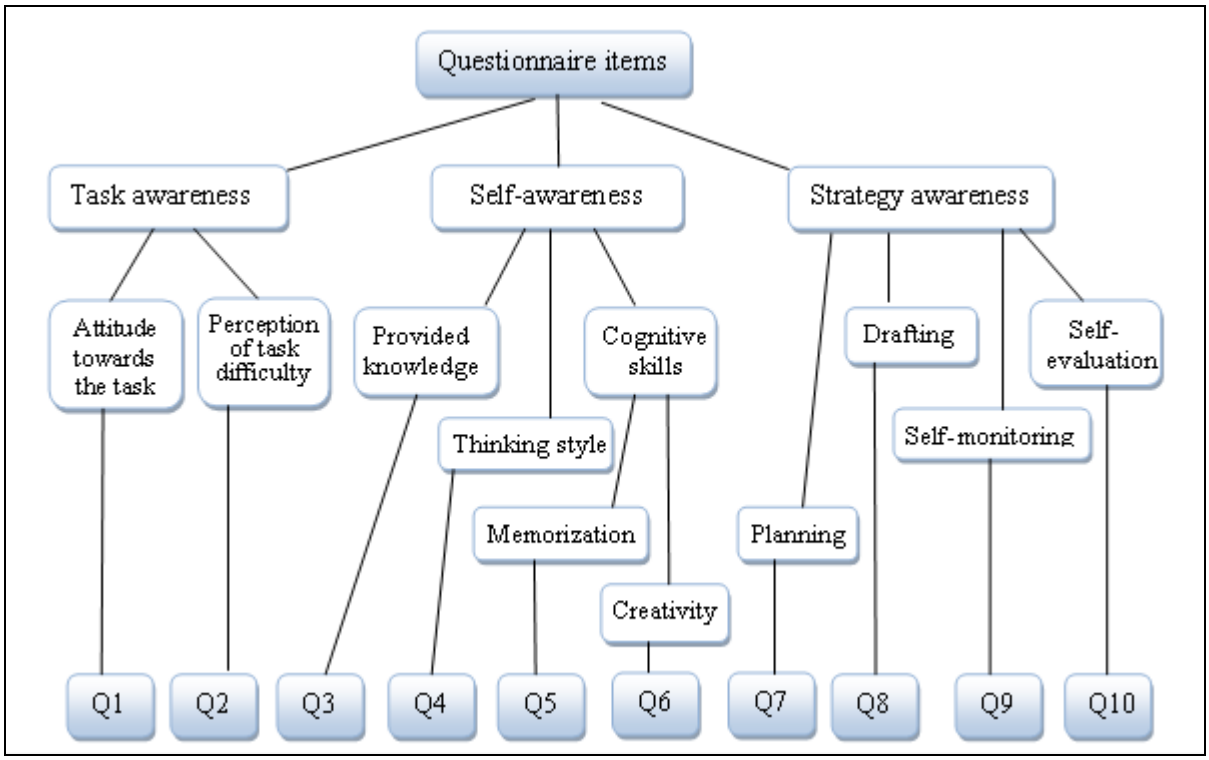



Figure 3- Follow-up questionnaire design

Therefore, the questionnaire was composed of ten questions; it attempted to collect information about the students' perception of their way of processing knowledge and skills in writing; its content is provided in figure 4.

**Students' Questionnaire**

This questionnaire aims at gathering information about EFL learners' manipulation of metacognitive knowledge in writing. Please, answer the following questions after performing the test tasks.

**1- How do you view each task?**

| | Non-preferred | Preferred |
|---|---|---|
| Task 1 | ☐ | ☐ |
| Task 2 | ☐ | ☐ |
| Task 3 | ☐ | ☐ |
| Task 4 | ☐ | ☐ |

**2- How do you perceive each task?**

| | Easy | Difficult |
|---|---|---|
| Task 1 | ☐ | ☐ |
| Task 2 | ☐ | ☐ |
| Task 3 | ☐ | ☐ |
| Task 4 | ☐ | ☐ |

**3- Which type of knowledge did you try to provide?**

☐ Taught information
☐ Constructed knowledge

**4-Which thinking style did you adopt?**

☐ Recall and retrieval of the learned information
☐ Synthesis and reconstruction of the learned knowledge using your own understanding and reflection

**5- To which extent did you rely on memorized knowledge?**

☐ Little ☐ Much

**6- To which extent did you try to be creative?**

☐ Little ☐ Much

**7-What is the strategy you applied for generating ideas?**

☐ Writing whatever comes into your mind on the spot without planning
☐ Thinking, reflecting and planning the expected output before writing

**8- When translating your ideas into a written form, which approach did you follow?**

☐ Writing directly on the given answer sheet without utilizing a rough draft
☐ Using a rough draft before writing on the given answer sheet

**9- Did you revise your answers?**

☐ Yes ☐ No

**10- Did you reflect on the quality of your ideas?**

☐ Yes ☐ No

Figure 4- Students' questionnaire

The questionnaire elicited the learners' consciousness of the writing process and strategies they applied for completing and responding to the given subtests. It relied on the use of dichotomous questions belonging to the close ended format which yields quantitative data. It tried to gather information about the students' rating of the tasks difficulty and the kind of the knowledge they supplied when answering the test. Then, it questioned them about their thinking styles by requesting them to mention if they were reproductive or productive thinkers. Also, it inquired about their cognitive abilities as they were asked to assess their degree of regurgitation and creativity. Furthermore, it investigated the students' employment of metacognitive strategies in written production tasks. The utilization of the aforementioned research tools helped to furnish quantitative and qualitative data whose analysis supplied a set of findings that are summarized in the following section.

**Data analysis**

The summary and interpretation of the gathered information relied on the exploitation of descriptive statistics including the mean and the standard deviation. Additionally, hypothesis testing relied on the application of inferential statistics involving a paired t-test, the McNemar's test for the significance of changes and the chi-square test of association. All these statistical tests were set at the 0.05 level of significance. In addition to the provision of quantitative information, qualitative data were furnished through the analysis of the content of the students' responses to the tests. The main research findings are summarized below.

**Tests results**

A two-tailed paired t-test was performed to assess the difference between the means of the tests scores. Table 2 provides an account of the main findings of the analysis of the students' marks obtained in the two testing conditions.

Table 2- Paired t-test results

| | Paired Difference | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 95% Confidence Interval of the Difference | | | | p-value |
| | M | SD | Lower | Upper | t | df | (2-tailed) |
| Pair1 Test1- Test 2 | 1.96 | .252 | 1.03 | .289 | 4.93 | 39 | .001 |

It can be inferred that the quality of the learners' written products is affected by their thinking styles since their performance in the first test (M=12.46) was greater than the one achieved in the second test (M=10.50) as it is illustrated in table 2. This result is overwhelmingly significant. Furthermore, the students' achievement in the majority of the sub-tests varied from a test to another. The McNemar' test for the significance of changes was conducted to rate the degree of alterations in the learners' performance in the subtasks. The outcomes of such an analysis are displayed in table 3.

Table 3- McNemar test results

| Test 1: / Test 2: | + / + | + / - | - / + | - / - | McNemar $x^2$ | p-value |
|---|---|---|---|---|---|---|
| Task1 | 04 | 25 | 10 | 01 | 6.43 | .01 |
| Task 2 | 06 | 13 | 18 | 03 | 0.81 | .37 |
| Task 3 | 09 | 16 | 13 | 02 | 0.31 | .58 |
| Task 4 | 03 | 28 | 08 | 01 | 11.11 | .001 |

N=40, df=1

From table 3, it can be noticed that the performance level attained by most of the students in the first activity decreased in the second test. This implies that a significant change was observed concerning the first task. Additionally, the majority of the learners failed to get better results in the fourth exercise of the second test revealing an overwhelmingly significant change in the students' writing performance in the last task. Indeed, the learners' scores in the first and fourth subtest of the second test were lower than those of the first one. Thus, the challenges faced by the students when resorting to a creative style of thought are more prominent at the level of vocabulary and essay production tasks stipulating analytic and evaluative skills. This means that the deployment of productive thinking in writing exerts a high cognitive load on the writer. Hence, the quality of the written output varies according to the adopted type of thinking styles which depend on the learners' degree of awareness. Accordingly, this issue is elicited in the subsequent section which concerns the analysis of the information supplied by the follow-up questionnaires.

**Questionnaires' results**

The chi-square test of association was conducted to analyze the data collected from the questionnaires for the purpose of providing evidence about the relationship between metacognitive knowledge and the type of thinking style deployed in writing. The findings of the two follow-up questionnaires are displayed in table 4:

Table 4- Students' questionnaires results

| Item | | Wave 1 | Wave2 | $x^2$ | *p-value* |
|---|---|---|---|---|---|
| Q1.Task Preference | | | | | |
| Task 1 | Preferred | 09 (22.5%) | 12 (30%) | .58 | .446 |
| | Non -Preferred | 31 (77.5%) | 28 (70%) | | |
| Task 2 | Preferred | 15 (37.5%) | 12 (30%) | .50 | .478 |
| | Non -Preferred | 25 (62.5%) | 28 (70%) | | |
| Task 3 | Preferred | 28 (70%) | 22 (55%) | 1.92 | .166 |
| | Non –Preferred | 12 (30%) | 18 (45%) | | |
| Task 4 | Preferred | 22 (55%) | 10 (25%) | 7.50 | .006 |
| | Non -Preferred | 18 (45%) | 30 (75%) | | |
| Q2.Perception of Task Difficulty | | | | | |
| Task 1 | Easy | 27 (67.5%) | 35 (87.5%) | 4.59 | .032 |
| | Difficult | 13 (32.5%) | 05 (12.5%) | | |
| Task 2 | Easy | 18 (45%) | 28 (70%) | 5.11 | .024 |
| | Difficult | 22 (55%) | 12 (30%) | | |
| Task 3 | Easy | 25 (62.5%) | 34 (85%) | 5.23 | .022 |

| | | | | | |
|---|---|---|---|---|---|
| | Difficult | 15 (37.5%) | 06 (15%) | | |
| Task 4 | Easy | 34 (85%) | 18 (45%) | 14.07 | .001 |
| | Difficult | 06 (15%) | 22 (55%) | | |
| Q3. Provided knowledge | | | | | |
| | Taught information | 20 (50%) | 10 (25%) | 5.33 | .021 |
| | Constructed knowledge | 20 (50%) | 30 (75%) | | |
| Q4. Thinking style | | | | | |
| | Reproductive thinking | 13 (32.5%) | 05 (12.5%) | 4.59 | .032 |
| | Productive thinking | 27 (67.5%) | 35(87.5%) | | |
| Q5. Memorized knowledge | | | | | |
| | Little | 17 (42.5%) | 26 (65%) | 4.07 | .044 |
| | Much | 23 (57.5%) | 14 (35%) | | |
| Q6. Creativity | | | | | |
| | Little | 29 (72.5%) | 10 (25%) | 18.06 | .001 |
| | Much | 11 (27.5%) | 30 (75%) | | |
| Q7. Planning | | | | | |
| | No-planning | 15 (37.5%) | 10 (25%) | 1.45 | .228 |
| | Planning | 25 (62.5%) | 30 (75%) | | |
| Q8. Drafting | | | | | |
| | without a rough draft With | 11 (27.5%) | 15 (37.5%) | .91 | .340 |
| | a rough draft | 29 (72.5%) | 25 (62.5%) | | |
| Q9. Revision | | | | | |
| | Yes | 28 (70%) | 21 (52.5%) | 2.58 | .108 |
| | No | 12 (30%) | 19 (47.5%) | | |
| Q10. Self-evaluation | | | | | |
| | Yes | 19 (47.5%) | 22 (55%) | .45 | .502 |
| | No | 21 (52.5%) | 18 (45%) | | |

Table 4 supplies data highlighting the idea that the students' self-awareness and knowledge of the writing task harmonize with the type of thinking styles tapped by the two distinct writing tests. Regarding the first question which concerned the learners' attitude towards each activity, it can be stated that there is a very significant association between the learners' task preference and the thinking level assessed through essay questions; most of the students preferred the reproductive activity based on the composition of written discourse requiring the application of the learned knowledge rather than the productive task that concerned the evaluation of the given topic in an essay.

Concerning the second question, one can mention the statistically significant interrelation between the students' perception of the task difficulty and the thinking level assessed in the exercises dealing with word, phrase and sentence generation in the first three subtests of the given tests. In fact, some students view the limited response activities based on reproductive thinking as more difficult than the ones hinging on productive thinking. This may be due to the fact that the former restrict the students' output to the recall of information which may be challenging for those learners who have difficulties in remembering the taught knowledge. Additionally, there is an overwhelmingly significant association between the students' perception of task difficulty and the type of thinking level tested in essay questions; the majority of the learners viewed the fourth subtest of the second test as challenging.

The students' responses to the third question denote a significant relationship between the type of information provided by the learners and the knowledge processing approach involved in the writing assignment. Nevertheless, some students seem to rely on the taught input in all cases which means that they are not able to reconstruct the learned knowledge and adhere to the lower-order levels of thought. The learners' answers to the fourth question elicited that the type of thinking style deployed by the learners is closely associated with the nature of the given writing test. This result is statistically significant ($x^2$ = 04.59, p= .032). In fact, the majority of the students said that they resorted to productive thinking when performing the first test while nearly all of them claimed that they deployed the same approach in the second test. This implies that most of the learners exploit the productive style in writing. On the other hand, few students said that they relied on reproductive thinking in the second test. Hence, they have a difficulty in shifting from a reproductive to a productive style of thoughtfulness.

Furthermore, the analysis of the fifth question has led to the conclusion that there is a significant interrelation between the learners' reliance on memorized information and the kind of knowledge processing approach activated by the given assignments as many students said that the degree of dependence on regurgitation in the first test was greater than the second one. Regarding the sixth question, the students affirmed that they were much more creative in the second test than the first one. The findings show an overwhelmingly significant association between creativity and the kind of thinking styles triggered by the writing tests. The results of the remaining questions have revealed that there is not a significant relationship between the level of thought tapped by the two writing tests and the students' strategy awareness at the level of planning, drafting, revising and self-evaluation. This implies that the learners' writing strategies constitute a set of habits and behaviours that depend on the routine of written expression that is shaped through practice and training. Moreover, the content analysis of the responses to the tests tasks has led to the inference of a set of limitations displayed by some students in each activity. Figure 5 provides a summary of the learners' writing difficulties.

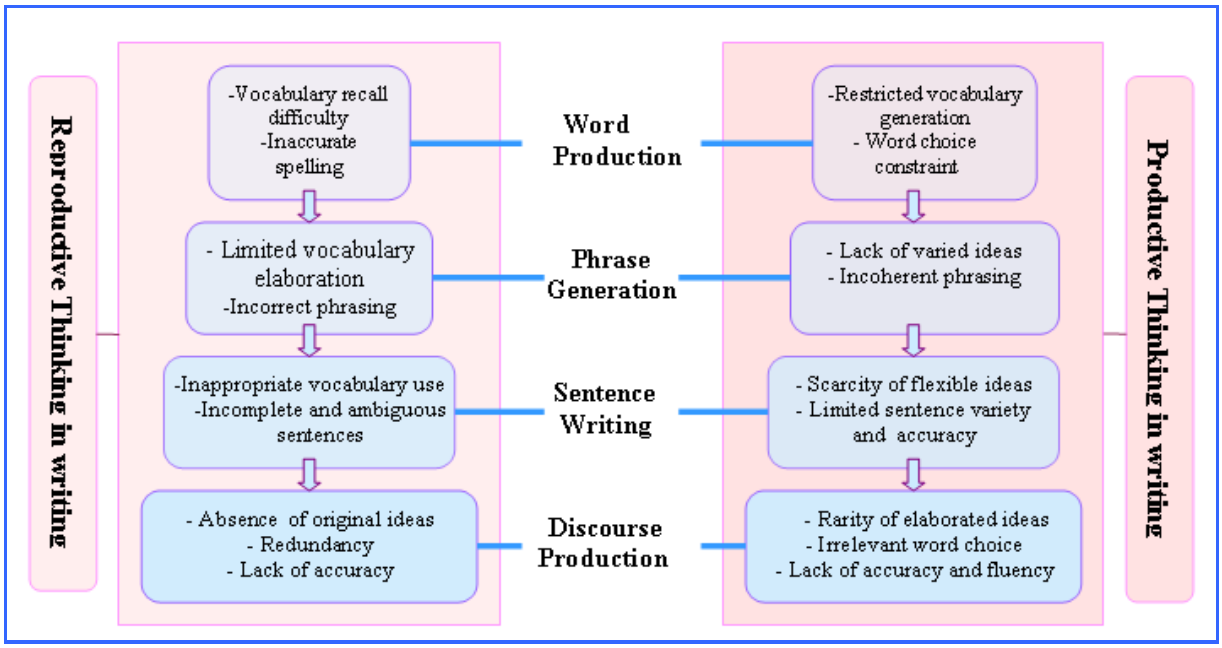



Figure 5- EFL learners' writing weaknesses

Generally speaking, the students' difficulties in creating a written output seem to inflate when resorting to productive thinking. These intricacies are mainly related to word choice and idea generation. Moreover, the most salient hindrance displayed at the level of discourse production is the issue of writing fluency which tends to become more prominent in performing productive tasks. Indeed, the average length of the sentences produced by low performers varied from six to 29 words in the first composition and from five to 25 words in the second one while the average length of the utterances generated by high performers ranged from nine to 40 words in the first essay and from seven to 33 words in the second one. The aforementioned weaknesses prevent the learners from developing expertise in writing. Accordingly, the following section will deal with the interpretation of the obtained results.

**Discussion and suggestions**

The students employ distinct approaches to knowledge processing depending on the nature of the writing task which can affect the quality of their written output. Therefore, the present investigation has attempted to provide information about the impact of EFL learners' ways of manipulating their thought on their achievement in written production. The results of the two tests have revealed that the students' scores obtained in the first test were better than those of the second one leading to the conclusion that the alteration of the learners' thinking styles prompted by distinct tasks influences their writing performance. Hence, the first hypothesis is confirmed. This means that the kind of written expression involving higher-order skills demands much more effort from the part of the learners.

Nevertheless, the writing process as a whole depends on a set of stages that call for distinct linguistic levels including word, phrase, sentence and essay production that may hinder the quality of the final output. The research findings have unveiled that EFL learners face difficulties at the level of word and discourse generation especially when resorting to productive thinking. Accordingly, the second hypothesis is validated. Actually, writing embodies multidimensional aspects including the linguistic dimension represented in the expression of ideas through words in a written form extending beyond the sentence level. The other aspect encompasses the writers' thinking style referring to their way of processing knowledge which also depends on another dimension represented in the manipulation of metacognitive knowledge. In this respect, the questionnaires' results have demonstrated that the students' task awareness and personal knowledge are closely associated with the type of thinking styles tapped by the writing tests. This inference corroborates the third hypothesis.

The findings of previous studies undertaken by various scholars have highlighted the issues related to thinking/writing styles with special reference to Writer-Based prose (Flower, 1979:33-35), the role of the distinct knowledge processing approaches in writing and the function of the metacognitive level in the process of written production (Bereiter and Scardamlia, 1987:210). Indeed, effective writing relies on the successful manipulation of language at various linguistic levels. For instance, vocabulary production deficiencies may slow down the fluency of thought and hinder idea generation which is a means of displaying content knowledge. Moreover, it may weaken the composition of discourse which is also affected by other factors such as the mastery of grammar and writing fluency. These aspects make the act of written expression beyond the sentence level a difficult task based on distinct knowledge processing approaches that depend on the writer's awareness. Consequently, it is necessary to improve the learners' writing ability taking into consideration not only the linguistic aspect of this skill but also the cognitive and metacognitive one. This is why further research is needed to elicit more information about the interaction of these dimensions in writing and the other influential factors such as the learners' personality traits.

In fact, the research findings of the present study have revealed that the learners' thinking styles influence their writing performance. Therefore, it is necessary to teach written composition from different perspectives taking into consideration the linguistic aspect in addition to the cognitive dimension of such a skill. Moreover, the assessment of writing should not only provide information about the students' linguistic abilities and degree of achievement but also trigger their inventive capacities. Furthermore, the teachers should use a variety of written production tasks; reproductive activities may be employed for the purpose of diagnosing the students' strengths and weaknesses in terms of their recall and comprehension of the taught material as well as their ability to apply the learned content and linguistic knowledge while expressing themselves in a written form; productive tasks should be given more importance as they give the possibility to the learners to develop expertise in writing and become creative writers.

Also, the teachers have to encourage the learners to view the writing skill as a form of invention and individual style that has to be prompted and refined in order to enable them to shift from the mere imitation and reproduction of others' ideas to the stage of creativity and personal production so that they will be able to be innovative when dealing with assignments entailing the generation of pieces of discourse longer than essays such as short term papers and dissertations. In addition to this, the students should be informed about the necessity of altering and refining their writing habits via the use of activities that foster the practice of writing strategies to train the learners to plan, redraft, revise and edit their written product.

**Conclusion**

When expressing themselves in a written form, the students deploy distinct approaches to convey their ideas and process knowledge depending on their capacities and the type of the provided activities. Accordingly, the present study has attempted to explore the influence of EFL learners' thinking styles on their writing performance taking into consideration the harmonization between metacognitive knowledge and the variation in the assessed levels of thought. The research findings have elicited that EFL learners' degree of achievement in writing tests varies according to the kind of the tested thinking style. This means that the deployment of productive thought in writing requires much skill than the use of the reproductive one as it calls for the learners' ability to infer, generate and elaborate creative and innovative ideas. However, such a capacity necessitates the mastery of various linguistic elements. In this context, the tests results have revealed that written production becomes more challenging for the learners when performing high level thinking activities dealing with the production of words and pieces of discourse. Moreover, the research results have indicated that EFL learners' knowledge of the task and personal skills are associated with the type of thinking style tapped by written production activities.

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