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The Learnability of Cognitive and Metacognitive Reading Strategies in Moroccan Higher Education: A Quasi-experimental Study

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Abstract

Constituting a substantive part of my unpublished Doctoral Dissertation that was defended in 2015, the present study probes into the impact of (meta) cognitive reading strategy training on Moroccan EFL students' strategic processing of textual content. In principle, it draws parallels between the (meta) cognitive strategic act implemented by the English department first-semester university learners (Control group: N=50; Experimental group: N=63) before the metacognitive strategy intervention and the one enacted by these two targeted groups after the intervention. To put to the test this straightforwardly stated assumption, such research instruments as reading comprehension texts, reading strategy training, and retrospective questionnaire were resorted to for eliciting the relevant data. The results reveal that the delivery of explicit (meta) cognitive strategy training is deemed a contributive factor in culminating in improved (meta) cognitive strategy application among the treatment group. Thus, a panoply of recommendations that are germane to education and research as well as a range of limitations which confronted the current research study are tacitly put forth.

Keywords: metacognition, cognitive reading strategies, metacognitive reading strategies, reading comprehension, strategy use, text processing

1. Introduction

It is plausible that the act of conducting insightful, rigorous research on English as a foreign language (EFL) reading in tertiary education cannot generate richly intriguing outcomes unless it is fundamentally linked to metacognition/ metacognitive thinking. This markedly

overriding assertion has been sturdily buttressed by many reading specialists and scholars (e.g., Huou & Cho, 2020; Morshedian, Hemmati, & Sotoudehnama, 2017; Miholic, 1994; Msaddek, 2015; Stewart & Tei, 1983) who underscore the leading, valuable role of metacognition in processing and synthesizing the written discourse in differing academic settings. In this respect, metacognitive thinking facilitates the task of grasping the textual input in an effectual fashion. Given that cognition and metacognition are inherently different in the way that cognitive tasks are directed and regulated by metacognitive thinking, they are inextricably interrelated. They both play a key role in contributing to an effective comprehension of the intended meaning. Hence, thinking about one's thinking is the core of strategic behaviour (Paris, Wixson, & Palinscar, 1986).

The specific issue under investigation reveals the authentic essentiality of the (meta) cognitively-oriented reading strategies (RSs) as facilitating agents for enabling EFL learners to develop deeper, richer understanding of what the author/writer intends to convey via his/her text. In this perspective, numerous research studies (e.g., Barone & Xu, 2008; Cook & Mayer, 1983; Forrest-Pressley & Gillies, 1983; Garner, 1987; Montague & Tanner, 1987) call for the use of these specific types of RSs (cognitive and metacognitive) to enhance text comprehension on a massive scale. This attests to the clear-cut premise that learning these strategies can contribute to the unraveling of the intended meaning of diverse genres of texts (e.g., narrative, expository, etc…) to which EFL university students, as mature learners, are regularly and invariably exposed.

In essence, it is declared that reading strategy instruction can be an invaluable medium for the development of the reading competency and proficiency of EFL learners. If the latter are provided with adequate training in the application of (meta) cognitive strategies to a diversity of written passages, it is markedly evident that they will be strategic, competent, and critical readers. Therefore, the findings of this experimental study will explore whether the inclusion of (meta) cognitive reading strategy instruction (CMRSI) in the Course of Reading Comprehension at the university level can contribute to the achievement of an enhanced textual reading and the attainment of meaning comprehension. Within this particular framing, it is assumed that the teaching of (meta) cognitive text-related strategies can be an essential precondition to assisting EFL university students, namely at the first semester level, to effectually assimilate and understand different written texts.

2. Review of Relevant Literature

2.1 A Cognitive Perspective on EFL Reading

It is plainly manifest that in their attempts to understand the textual content within the broad landscape of academia, learners tend to adopt basic cognitive approaches which robustly constitute effective prerequisites in the field of second language (SL)/ foreign language (FL) reading. These approaches are mainly embodied in the bottom-up, the top-down, and the interactive orientations that are part and parcel of the proactive process of reading differing types of written discourse in an academic environment.

To start with, the bottom-up approach, which is also termed "data-driven processing" (Celce-Murcia & Olshtain, 2000), puts a substantial emphasis on the written text as an

essential means of achieving comprehension. Indeed, in their effort to understand the text, readers heavily rely on the process of decoding the meaning of words and sentences. This demonstrates that the "reader processes each word letter-by-letter, each sentence word by word and each text sentence-by-sentence in a linear fashion" (Grabe & Stoller, 2002, p.32). Succinctly put, the meaning of the written discourse is constructed via the analysis and understanding of the included lexical items and statements. In this sense, reading is manipulated by textual input and the reader plays a relatively passive role in the process (Resnick & Weaver, 1979). Thus, within the general framing of the bottom-up approach, the building of the meaning is text-related and content-based. This alludes to the basic premise that readers focus their attention on what is contained in the text as the primary source of meaning.

Adopting the same view of reading stated by Gough (1976), LaBerge and Samuels (1985) assert that the act of reading written texts involves "transforming written patterns into meanings" (p.689). Moreover, they posit that the two major variables, automaticity and attention, are of critical significance to the reading process. For LaBerge and Samuels (1985), automatically knowing the meaning of lexical items can allow the learner readers to allocate a great deal of their mental effort, cognitive ability, and careful attention to the process of text comprehension. In other words, if EFL readers easily perceive the included concepts/ terminologies, they can process the textual content more effectively and successfully.

The top-down approach, as claimed by wood (1983), refers to "the expectations, thoughts, and knowledge of the reader" (p.6). It is primarily concerned with the fact that readers can formulate predictions and hypotheses while being engaged in the process of reading. This approach, which is "conceptually-driven" (Schwartz, 1984), makes the reader depend, to a greater degree, on his/her previously acquired knowledge as an important step towards the attainment of an effective comprehension of the written text. The principal aim of the reader, in the course of attempting to make sense of the text, is merely to confirm or disconfirm the formed predictions and anticipations regarding the textual content. So, unlike the bottom-up approach which is text-related, the top-down approach is hypothesis-based as it contributes to the construction of text meaning.

Basically, the top-down approach is conceived of by many researchers (e.g., Alderson, 2000; Goodman, 1982), as the 'psycholinguistic approach' to reading. In fact, Goodman (1982), a reading theorist, tends to relate the act of reading to the basic fundamentals of cognitive psychology. For Goodman (1982), reading is a 'psycholinguistic guessing game' in which readers predict the text meaning on the basis of minimal textual information and maximum use of background knowledge. Widely seen from this view, the reader, in his/her attempt to approach a specific text, tends to select the crucial ideas and link them to his/her prior knowledge with the key purpose of achieving an overall understanding. This reveals that the reading process, as Goodman (1982) states, involves predicting, confirming and correcting.

Grabe (1991), who holds a similar view, maintains that interactive approaches to reading refer to two differing conceptions: (a) the interaction between the reader and the text and (b) the interaction of many component skills (p.383). The first conception is fundamentally concerned with the basic premise that an effective understanding of the textual meaning is

dependent on both the readers' prior knowledge and the information contained in the text. This means that the process of comprehending the underlying content is conceptualized as an interactive 'dialogue' between the reader and the text. Indeed, the reader attempts to interpret what is included in the written discourse in the light of what he/she already knows.

As for the second conception, the interaction of component skills, it refers to the implementation of both lower-level skills (e.g., authentic word recognition skills) and higher-level skills (e.g., comprehension/ interpretation skills, (Carrell, 1989; Rayner & Pollatsek, 1989; Samuels & Kamil, 1984). The integration of these two component skills is of primary importance in the sense that they assist readers, while approaching the written input, to attain an effective comprehension. These component skills can be made use of by the learner readers in a simultaneous and interactive way. Clearly, the two conceptions, the reader-text interaction and the component skills integration, do basically underlie the interactive approach to textual reading.

2.2 Metacognition & EFL Textual Processing

The term metacognition, as a purely mature form of reasonable, high-level thinking that enables the cognitive processing of information, occupies a seemingly vast part in the domain of educational and cognitive psychology. Indeed, it was coined by Flavell (1971) who tended to explicitly expound the metacognitive control as well as the cognitive monitoring that orient the human mind towards not only comprehending a host of conceptions and ideologies, but also thinking about the proactive and introspective mechanisms through which information is perceptually and cognitively processed. This reveals that metacognition is viewed as an efficacy-oriented process of reflective thinking and rational reasoning (Msaddek, 2016). It is the learner's potential ability to think, rethink and reflect upon the high-level processes and procedures that facilitate the execution of a wide plethora of cognitive activities/ tasks (i.e., reading, writing) within the arena of language learning in particular, and within the education sphere in general.

In an attempt to clarify the viable role of metacognitive knowledge in textual reading, Stewart and Tei (1983) divide this knowledge into three kinds, namely knowledge of reading, knowledge of textual meaning, and knowledge of strategies. The first type, which refers to the way one can approach a particular written text, "enables readers to make better use of their resources" (Stewart & Tei, 1983) as readers, namely skilled ones, utilize both their background knowledge and information-processing techniques to successfully cope with the text. As regards the second type, knowledge of textual meaning, readers are expected to pinpoint the significant parts of the text that make up the core content. Indeed, the fact of concentrating on and giving increased attention to the crucial ideas, views, and concepts can significantly facilitate the process of meaning construction. With respect to the knowledge of strategies, it pertains to the learners' acute awareness of RSs, namely cognitive and metacognitive ones that are foundational to the construction of textual comprehension. These stated three types of metacognitive knowledge (i.e., knowledge of reading, knowledge of textual meaning, strategy knowledge), if suitably applied by learners, can contribute to the achievement of an efficient textual comprehension.

2.3 Cognitive & Metacognitive Reading Strategies (RSs)

Flavell (1981) admits that cognitive reading strategies (CRSs) are "aimed at the straightforward goal of making cognitive progress". They are utilized by learners to approach any written text for the sake of obtaining the meaning. Actually, as mental procedures, CRSs enable learners to perceive and conceive the content in order to "increase the likelihood of comprehension" (Van Den Broek & Kremer, 2000). They are used by learners throughout the process of text reading. For instance, by reading the text title or the first paragraph of the text, learners can predict the included meaning. In so doing, they formulate a framework within which they can sufficiently process and assimilate the content. They can also infer the meaning of some lexical items and sentences via depending on the context. Another basic cognitive strategy that can be made use of in text processing is selecting the major ideas that form the core content of the written discourse. In fact, these and other strategies (e.g., visualizing, underlining, note taking, paraphrasing), which assist the learners to gain an overall understanding, are cognitive in essence.

On the contrary, metacognitive reading strategies (MRSs) are those strategies which involve self-reflection and thinking about reading (Lawrence, 2007). They enable learners to plan what they are expected to make sense of, monitor the process of comprehension and evaluate their performance in the reading process. Basically, MRSs are of critical importance and higher value in that they assist EFL readers to observe and be aware of how the course of understanding is achieved during textual reading. In other words, it is through the use of MRSs that learners can direct their cognitive efforts and abilities towards the accomplishment of an effective, consistent comprehension of the text meaning. This type of strategies can be conceived of as 'regulatory' capabilities which constitute the prerequisite steps that are taken by learners in approaching and having a full grasp of the subject matter of the given text. Accordingly, both cognitive and metacognitive RSs are targeted in the current study.

2.4 Major Classifications/ Taxonomies of Reading Strategies (RSs)

Given the dichotomous conceptions, approaches, and views pertaining to the process of reading, it can be stated that the strategies used in this process have also been differently categorized and classified by many reading researchers and theorists. Indeed, a wide range of 'taxonomies' of reading strategies (RSs) have been developed and set forth with a view to clarifying how processing, analyzing, and synthesizing the written discourse is conducted by the learner readers. Yet, though there exist seemingly divergent typologies of RSs, most, if not all, researchers seem to converge on certain typical points and features that characterize these strategies.

In his attempt to explore the RSs used by the readers, Olshavsky (1976-77), for instance, adopting a 'think-aloud' procedure, puts forth two types: (a) problem identification strategies and (b) problem solving strategies. The first type (e.g., stated failure to understand a word, stated failure to understand a clause) is used by readers to pinpoint the problem that stands as an obvious impediment to proceeding in textual reading and attaining comprehension. As concerns the second type, it is intended "to solve problems encountered in reading" (Olshavsky, 1976-77, p.671). In effect, problem solving strategies, according to Olshavsky,

are manifestly embodied in using the context, rereading, synonym substitution, inference, addition of information and hypothesis-making. These strategies that pertain to identifying and solving problems during text analysis play an important role in the comprehension process.

Block (1986) conducted a study in order to reveal the basic RSs implemented by native and ESL speakers. Using also a 'think-aloud' procedure, as an effective way of allowing her subjects to verbalize their thoughts, she came to the conclusion that RSs can be classified into general and local strategies. 'General strategies' are closely associated with text understanding and comprehension monitoring (e.g., anticipating content, recognizing text structure, integrating information, questioning textual content, using background knowledge, monitoring comprehension), whereas 'local strategies' are purely text-bound (e.g., paraphrasing, rereading, questioning the meaning of sentences and words). Indeed, most of these strategies identified by Block (1986) are investigated in the current experimental study through the use of the retrospective questionnaire (RQ).

On the other hand, in his attempt to classify RSs, Davies (1995), another reading researcher, presents two 'taxonomies': (a) observable RSs and (b) non-observable RSs. The first 'taxonomy' is interconnected with the readers' behaviour in trying to understand the textual content in an efficient way (e.g., marking the text, pausing, rereading). With reference to the second 'taxonomy', it is primarily concerned with the readers' complete involvement in the process of reading written texts (e.g., activating prior knowledge, questioning the text, interacting with the text, monitoring one's understanding, setting goals). Indeed, according to Davies (1995), RSs can be deemed either as unconscious behaviour (observable strategies) or conscious behaviours (non-observable strategies). In other terms, unconscious RSs are usually, if not always, performed by readers, both skilled and unskilled, in a spontaneous, unplanned way, whilst conscious RSs involves a great amount of mental efforts and attention.

Mokhtari and Reichard (2002), using a 'self-report technique' called 'Metacognitive Awareness of Reading Strategies Inventory' (MARSI), tend to categorize RSs into three primary kinds. The first kind is connected with 'global strategies' which are mainly implemented by learners with the purpose of planning how they can process the textual content. These strategies are manifested in many basic steps (e.g., setting a purpose for reading, activating prior knowledge, predicting, confirming predictions, previewing textual content, using context clues). The second kind pertains to 'problem solving strategies' which are used by learners with a view to remedying the comprehension failure they encounter during text processing (e.g., reading slowly, reflecting on reading, rereading, visualizing the content, guessing the meaning of unknown words). As to the third kind, it is related to 'support strategies' (e.g., taking notes, paraphrasing, self-questioning, underlining and summary writing). These strategies "provide the support mechanisms aimed at sustaining responses to reading" (Mothtari & Reichard, 2002).

By conducting a quasi-experimental study that was intended to measure the efficacy of the explicit (meta) cognitive reading strategy instruction in revamping EFL university students' strategy use and reading achievement gains in the Moroccan context, Msaddek (2015) taxonomizes reading strategies into cognitive and metacognitive ones. Cognitive reading

strategies (CRSs) are manifested in predicting, inferring, main idea selection, visualizing, underlining, note taking, and paraphrasing. As for metacognitive reading strategies (MRSs), they encompass planning strategies (e.g., goal-setting, background knowledge use), monitoring strategies (e.g., self-monitoring, self-questioning, rereading), and evaluating strategies (e.g., recalling, summarizing). These strategies can be utilized by the learners in synthesizing and apprehending different types of written discourse.

Granted that many researchers (e.g., Block, 1986; Davies, 1995; Mokhtari & Reichard, 2002) set up diverse classifications of reading strategies (RSs), the provided categorization (cognitive and metacognitive reading strategies) can be an inclusive, general one in the sense that it incorporates, to the researcher's knowledge, almost all the most crucial strategies pertaining to studying and learning from written texts in tertiary education. Indeed, this set forth 'taxonomy' of RSs presents an overall overview of the primary mental mechanisms, procedures, and processes that are involved in textual reading as a cognitive undertaking in an EFL context.

The types of RSs put forth above are only few among many others presented in the wide body of the reading literature. In view of this fact, it is found that many reading researchers share common strategies in their categorizations. For instance, 'monitoring comprehension' is viewed by Block (1986) as a general strategy which allows readers to have control over the reading process, whilst Davies (1995) groups it as a non-observable reading strategy which entails the regulation and direction of cognitive efforts. Further, the strategy of 'rereading' is manifestly included in all the above-presented categorizations. Another overlap in categorizing the RSs is observed in the general strategies and the global ones which are presented by Block (1986) and Mokhtari and Reichard (2002) respectively.

All the cited strategies related to textual analysis are currently investigated in this study through the use of the retrospective questionnaire (RQ), which was designed by the researcher, in an attempt to uncover whether these strategies are developed by the learners out of maturity and spontaneity or via the exposure to instruction. On the whole, in trying to come up with a holistic, universal categorization of RSs, it can be particularly put forth that the latter can be classified into two primary clusters: cognitive and metacognitive strategies. This 'taxonomy' is highly advocated by many reading specialists and researchers (e.g., Barone & Xu, 2008; Brown, 1981; Garner, 1987; Msaddek, 2015; O'Malley & Chamot, 1990; Vellutino, 2003).

2.5 Reading Strategy Training

It is true to posit that an array of insightful studies have reflected that instruction/ training in comprehension strategies is effective in helping students learn strategies and that when these strategies are applied, better comprehension follows (Boulware-Gooden, et al., 2007; Morshedian, et al., 2017; Pei, 2014; Pressley & McCormick, 1995; Williams, 2007). This premise reveals that the process of strategy instruction is fundamentally integral to assisting learners to nurture an enabling range of RSs while engaged in the act of processing the written text. Indeed, an entire understanding of what is contained in text passages can be achieved only if learners are adequately trained in the use of (meta) cognitive RSs. Therefore,

reading strategy instruction (RSI) can be deemed of potential importance to the acquisition and development of RSs as it certainly assists learners to be 'self-directed', 'self-controlled', and 'self-regulated' in their conscious attempt to make complete sense of text information. This is what the present intervention study straightforwardly intends to achieve.

Most important, RSI can have a beneficial impact on the learner readers' strategy use. This basic view is underpinned by Kern (1989) who suggests that strategy instruction has a positive effect on the readers' ability to infer text meaning. It essentially assists EFL university students, as mature, autonomous learners, to develop utter awareness of a variety of heuristics that facilitate the act of undertaking an efficiency-bound sort of academic reading. That is, learners, by thinking critically and reflectively, can plan and adjust their approach to analyzing the discourse content, engage in inferential procedures, resort to sophisticated paraphrasing, track comprehension, and assess the reading act undertaken. Hence, upon receiving reading strategy instruction, learners can immerse themselves in planful, deliberate, and purposeful reading as some researchers (e.g., Dole, et al., 1996) strongly affirm. This uncovers that the utility of RSI mainly lies in the increased improvement of the readers' strategic steps which lead to the achievement of an utter comprehension of the text. The findings of this conducted experiment are intended to support this postulated claim.

3. Research Objectives & Research Questions

The current quasi-experimental study investigates the impact of (meta) cognitive reading strategy training on Moroccan EFL students' strategic processing of the written discourse. In other words, it draws a comparison between the (meta) cognitive strategic act invoked by the English department first-semester university learners (Control group: N=50; Experimental group: N=63) prior to the intervention and the one deployed by these two groups following the metacognitive strategy intervention. Under this account, two leading research questions have been formulated with a view to unraveling the issue under scrutiny.

a. To what extent do Moroccan EFL university learners cognitively and metacognitively strategize the written discourse?

b. In what ways does the explicitness-oriented metacognitive strategy training revamp Moroccan EFL university learners' deployment of cognitive and metacognitive reading strategies?

4. Method

4.1 Participants

The current study addresses two EFL university groups (control group & experimental group) pursuing their studies in the English department at the Faculty of Letters and Human Sciences (FLHS) in Rabat. The treatment group (N= 63) was initiated into thoroughly comprehensive (meta) cognitive strategy training for a semester-long period (Semester One), whilst the control group (N=50) was instructed in reading comprehension without receiving any reading strategy-based training that is metacognitive in essence. Indeed, both groups were mixed-ability learners who differed markedly at the level of EFL reading potentiality.

4.2 Procedure

This exploratory study is predicated on a quasi-experimental research design. The underlying rationale behind the implementation of this type of research design is to demonstrate the vital significance of the process of cognitive and metacognitive reading strategy instruction (CMRSI). In fact, the quasi-experimental design adopted herein may reveal the extent to which the learnability of reading strategies (RSs), cognitive and metacognitive, is possible in a Moroccan university EFL context. In other words, the exposure of the experimental group to the differential types and the actual application of the text-processing strategies can evince an increased improvement at the level of text analysis and meaning synthesis. Actually, the authentic effectiveness of an instructional intervention can be evident so long as it includes both the control and treatment groups which are deemed the main respondents in this study.

The prime objective of the explicit (meta) strategy training was to equip Moroccan EFL first-semester university students with the underlying (meta) cognitive strategic moves used in text processing and meaning analysis. Indeed, the experimental group was not only initiated into the typologies and essentiality of RSs, but also to the process of practicing and applying the focused strategies in analyzing and approaching differing genres of written discourse (e.g., narrative, expository) for the whole semester (Semester One). Taking serious account of the fact that most Moroccan EFL learners utilize more cognitive than metacognitive RSs, the operated CMRSI was practically designed to inculcate the experimental EFL learners with all these types of text-bound strategies with a heavy emphasis on the latter type (metacognitive reading strategies).

As regards the retrospective questionnaire (RQ) used in this case study, it was uniquely devised by the researcher (Msaddek, 2015). It was administered to the EFL subjects belonging to both the control and experimental groups. This was effected with a view not only to uncover and tap into the widely utilized reading ‘heuristics’, but also to gauge the effect of CMRSI on the learners’ reading behaviour and strategic potential in an EFL context. To illustrate, all the targeted EFL subjects (control and experimental), upon completing the reading comprehension texts were asked to fill out the RQ at both the beginning and the end of the training sessions. In fact, the questionnaire delivered in the pre-intervention session was also given to the involved groups in the post-intervention session. This enabled the researcher to explore whether the group being exposed to the experimental treatment had acquired the target text-based strategies throughout the course of the semester (Semester One). This reveals how the strategic reading moves (e.g., predicting, inferring, main ideas selection, visualizing, underlining, note taking, paraphrasing, goal-setting, background knowledge use, self-monitoring, self-questioning, rereading, recalling, summarizing) are conducted and effected by EFL learners.

Essentially, the items included in the retrospection-based questionnaire ‘instrumentalized’ in this study were explicitly stated to assure the process of gaining more accurate, richer data regarding the use of cognitive and metacognitive RSs at both the pre- and the post-experiment stage. For clarity purposes, some incorporated questions required only short answers (e.g., yes/no). Other questions entailed the selection of responses from the given list. In fact, the rationale behind the provision of some multiple-choice answers in the RQ was to

avoid any misunderstanding of the key points of the stated questions among the EFL participant learners and to assist them to think reasonably and critically about what was expected from them to put forth and explain within the bounds of text-analysis techniques. Additionally, other kinds of open-ended questions, whose use in the questionnaire is advocated by many researchers (e.g., Gendall, et al., 1996), were also presented in the RQ in order to give the subjects the chance to report on their strategic reading behavior, processing steps, and analytical moves.

The data gained through the retrospective questionnaire (RQ) were computed by means of the Excel software Program with the purpose of highlighting the perceived influence of the strategy-based training on the participants' (meta) cognitive reading strategies (e.g., predicting, inferring, main idea selection, visualizing, underlining, note taking, paraphrasing, goal-setting, background knowledge use, self-monitoring, self-questioning, rereading, recalling, summarizing). The cognitive and metacognitive reading heuristics reported at the pre- and post-treatment levels were numerically counted in percentile forms and presented in illustrative figures. This evinces whether the initiated training can positively enhance the EFL readers' strategic textual processing, namely among the treatment group.

5. Results

5.1 The Control Group's Reading Strategy Use (RSU) at the Pre- and Post-intervention Levels

As it is displayed in the two figures (1 & 2) below, the usage of the most effective reading strategies (RSs) amongst the control group is relatively constant and limited. The strategies, which were reported by the subjects under the control condition at the pre-intervention stage, seem to be somewhat recurrent at the post-intervention stage. In this regard, the major strategies executed by the control subjects in their processing of the textual input at both the pre- and post-intervention levels are manifested in the following figures.

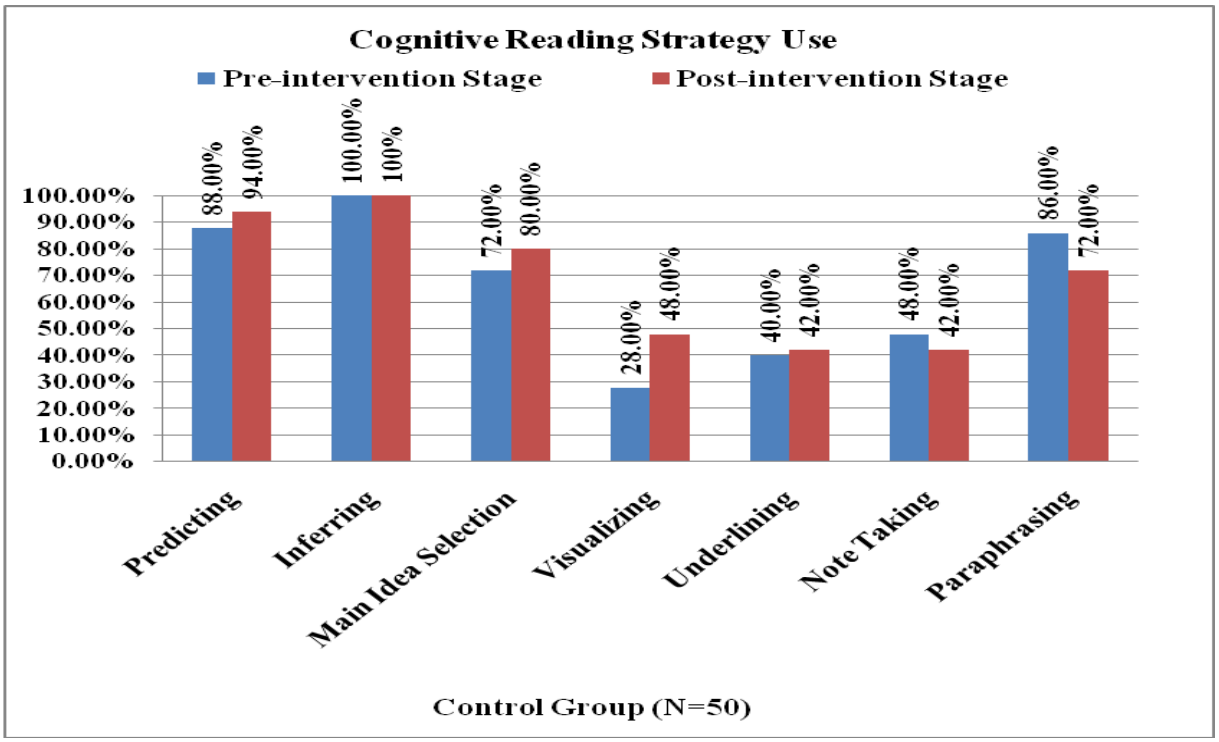

Figure 1. Use of Cognitive Reading Strategies at Pre- and Post-intervention Stages among the Control Group

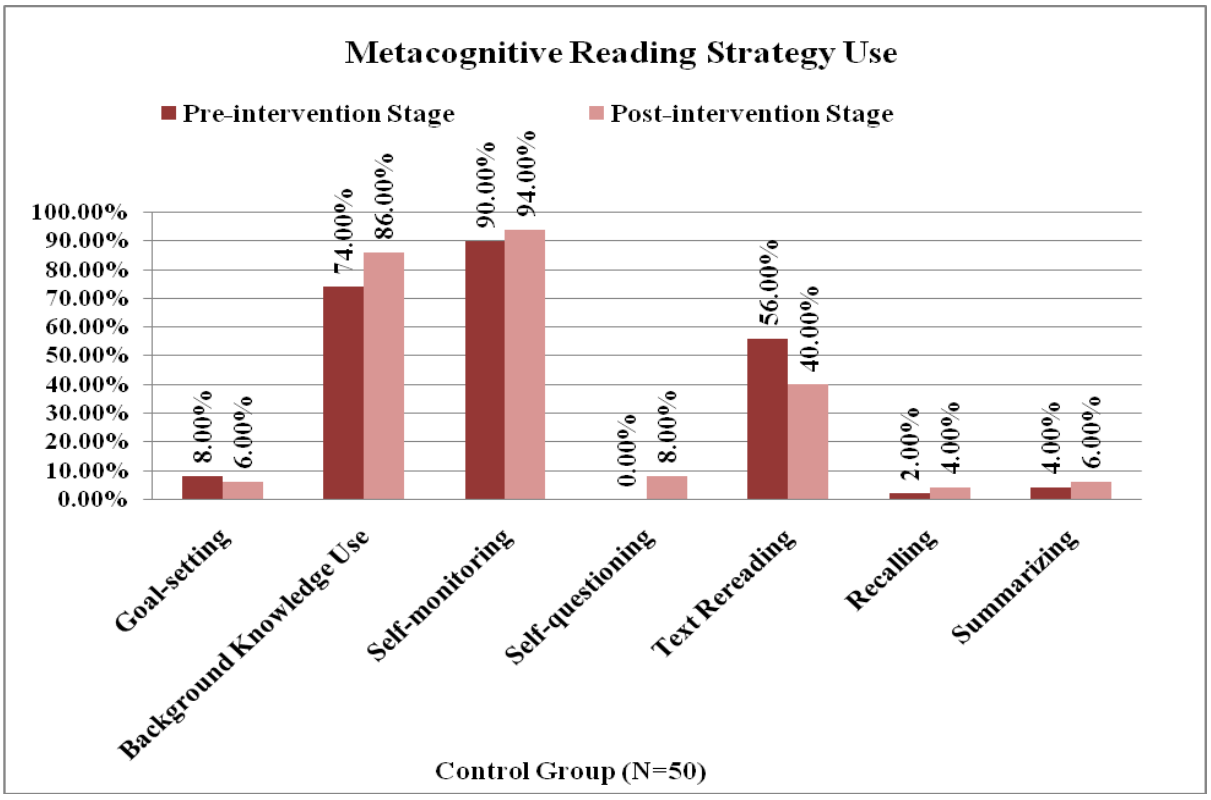

Figure 2. Use of Metacognitive Reading Strategies at Pre- and Post-intervention Stages among the Control Group

A large number of the CRSs and a small set of metacognitive reading strategies were resorted to by the control group for grasping the written discourse. Obviously, at the pre-intervention level, the deployment of cognitive techniques (e.g., predicting, inferring, main idea selection, underlining, note taking, paraphrasing) seems to be increasingly predominant across the pre- and post-intervention. In a similar way, at the post-treatment stage, the control group retained almost the same CRSs which they did invoke and apply while attempting to decipher textual input at the pre-intervention stage (See Figure 1).

With regard to metacognitive reading strategy use (MRSU), there was a noticeable inadequacy in terms of using planning strategies (e.g., goal-setting), monitoring strategies (e.g., self-questioning, rereading) and evaluating strategies (e.g., recalling, summarizing) in analyzing the content of the reading texts assigned at the pre-and post-intervention stages. As the findings above display, in the pre-intervention level, the control group utilized some MRSs (background knowledge use, self-monitoring, and text rereading) in analyzing and synthesizing the written discourse. Whilst background knowledge was utilized by the control group with percentages of 74% and 86% at the pre- and post-treatment respectively, self-monitoring was effected by the control participants with proportions of 90% and 94% across the pre-post-intervention. The other metacognitive strategy, text rereading, was implemented with occurrences of 56% and 40% at the pre- and post-treatment stages sequentially.

Actually, the processes of setting goals before reading, self-questioning the textual content, and evaluating the comprehension act, as metacognitive strategic steps, were not adequately made use of by the control subjects in endeavoring to comprehend the written discourse at the pre-intervention stage. In the same way, at the post-intervention stage, the sampled subjects reflected a heavy reliance on the same strategies (i.e., background knowledge use, self-monitoring, and text rereading) they utilized at the pre-intervention stage.

5.2 The Experimental Group's Reading Strategy Use (RSU) at the Pre- and Post-intervention Levels

It should be noted that the sampled EFL student-readers exposed to the experimental treatment did develop and acquire a plethora of (meta) cognitive reading strategies (RSs). In fact, the strategies that were reported to be depended upon by the experimental group in deciphering the content of the written discourse at the pre-treatment stage were reinforced and supplemented by other enabling strategies at the post-treatment stage. The results pertaining to (meta) cognitive reading strategy use among the experimental group are showcased in the figures below.

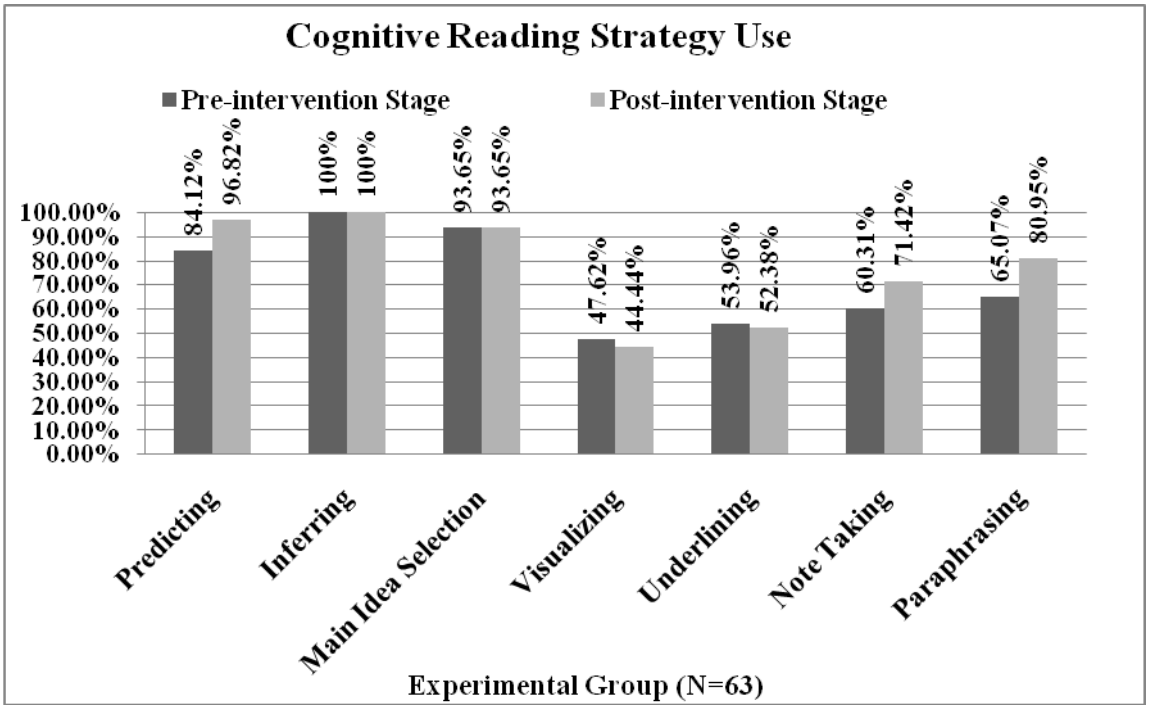

Figure 3. Use of Cognitive Reading Strategies at Pre- and Post-intervention Stages among the Experimental Group

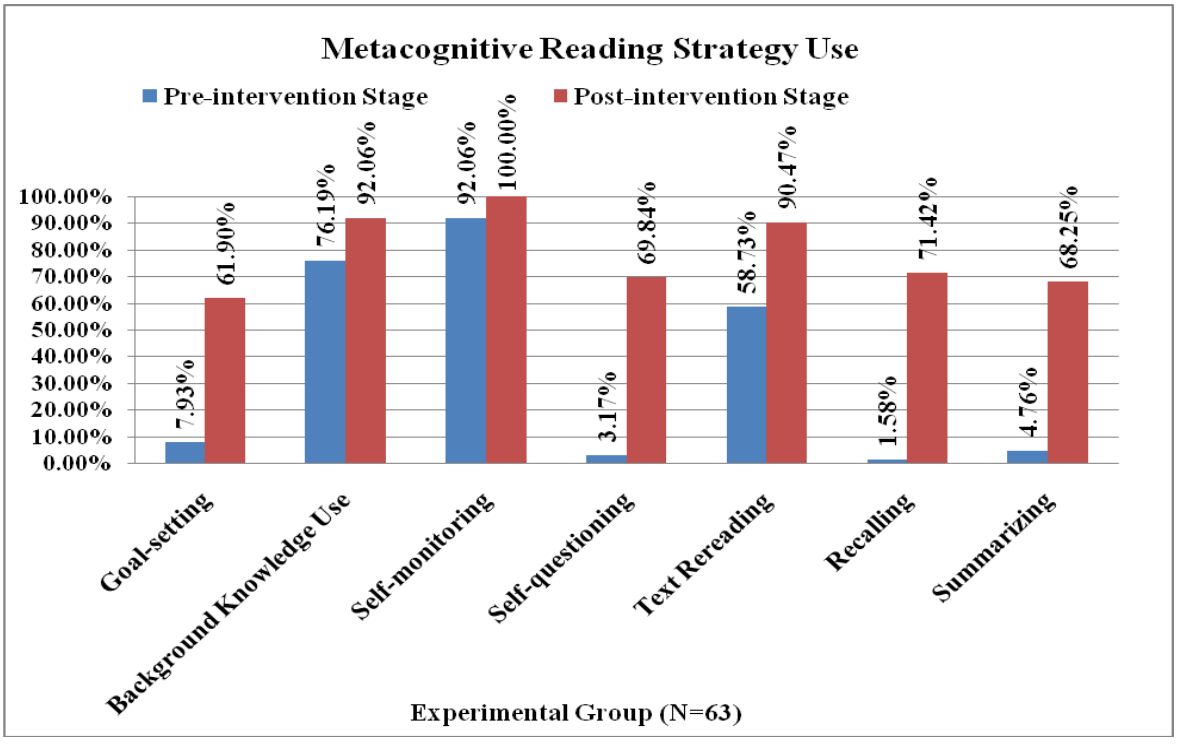

Figure 4. Use of Metacognitive Reading Strategies at Pre- and Post-intervention Stages among the Experimental Group

As the findings stated in the two figures above tacitly show, heightened awareness of the core importance and typologies of the most sophisticated RSs (e.g., predicting, inferring,

paraphrasing, goal-setting, self-questioning, recalling, summarizing), as well as their use in reading the texts assigned throughout the metacognitive strategy intervention, did strengthen the experimental subjects' metacognitive knowledge pertaining to the deployment of these strategic moves and actions which certainly ensure sufficient interpretation and understanding of the textual meaning.

In comparing the cognitive and metacognitive RSs used by the experimental participants throughout the pre- and post-intervention, one can observe that the target EFL readers belonging to the experimental group reported employing more cognitive and metacognitive RSs across the pre-post-treatment continuum. In more specific terms, at the pre-treatment level, by taking a glance at the stated results in the above figures (Figure 3 & Figure 4), one can realize that a heavy dependence on CRSs (e.g., predicting (84.12%), inferring (100%), main idea selection (93.65%), visualizing (47.62%), underlining (53.96%), note taking (60.31%), paraphrasing (65.07%) was reflected by the experimental group, whereas a set of MRSs were employed with minimal frequencies (e.g., goal-setting (7.93%), self-questioning (3.17%), text rereading (58.73%), recalling (1.58%), summarizing (4.76%) in reading the written text.

Yet, at the post-treatment level, the results pertaining to RSU among the strategy-instructed group took differing directionality as an increased dependency on the use of MRSs seems to characterize the experimental group's way of approaching the assigned written texts. While the application of CRSs represents more substantial proportions (e.g., predicting (96.82%), inferring (100%), main idea selection (93.65%), visualizing (44.44%), underlining (52.38%), note taking (71.42%), paraphrasing (80.95%), MRSU is marked by higher frequencies (e.g., goal-setting (61.90%), background knowledge use (92.06%), self-monitoring (100%), self-questioning (69.84%), text rereading (90.47%), recalling (71.42%), summarizing (68.25%) in reading and comprehending the textual content. This evinces an indication that increased awareness of CRSs and MRSs can be the determinant element for effective RSU amongst the participating EFL subjects. The evidence accounting for this high strategy consciousness is the increasing number of (meta) cognitive strategy occurrence in coping with the written discourse among the strategy-trained participants at the post-intervention level (see Figures 3 & 4).

6. Discussion

The present study is intended to measure the conceived influence of metacognitive strategy intervention on university-level students' usage of cognitive and metacognitive reading strategies (RSs). By drawing a parallel between the set of RSs used by both groups (control and experimental) at the pre-treatment stage and the repertory of RSs called upon by both participating groups at the post-treatment stage, it is manifest that the intervention group internalized the (meta) cognitive text-related strategies that are of intrinsic value for grasping the written discourse in its entirety. In essence, prior to the intervention, both the control and treatment groups seem to be parallel in the frequent use of CRSs as well as MRSs.

According to the results reached in light of this research study, the underlying reading 'heuristics' that were frequently deployed by the sampled EFL learner readers are mostly of

cognitive nature. Yet, the strategies, especially the metacognitive ones, reported by the EFL participants of both groups (control and experimental groups) were characterized by insufficiency and ineffectiveness. This apparently reveals that their strategy repertory, namely at the pre-intervention level, was rather undeveloped and limited. Thus, a lack of astute awareness of RSs can restrain, at times, the target groups from implementing the sophisticated heuristic processes across different academic written texts.

At the post-intervention, it was observed that there was a demonstrable difference between the treatment and the non-treatment groups in terms of the frequency of RSU. Notably, an increased utilization of (meta) cognitive text-processing techniques was profiled among the experimental group which was exposed to the strategy intervention. This succinctly implies that the process of instructing EFL learners on text-analysis strategies (i.e., cognitive, metacognitive) contributes to the enhancement of the application of these strategic moves that ensure the accessibility to textual meaning. While some basic RSs resorted to by the experimental participants prior to strategy training were retained, other effective strategies have been added on and recruited as a result of the conducted strategy training among the same group (the experimental one). This particular fact can be corroborated via 'juxtaposing' the findings relative to strategy use of both groups on the post-intervention level (See figures above in the Results Section). In effect, a marked increase in the execution of RSs, namely metacognitive ones, had been achieved from the pre- to the post-intervention among the treatment subjects.

Actually, being provided with sufficient, intensive practice in the use of CRSs in processing and digesting academic written texts, the experimental EFL learners seemed to have developed greater awareness of this kind of generic 'heuristics' whose chief purpose is enabling an effective understanding of the text message in its entirety. Hence, it is claimed that, even though both groups resorted to CRSs, the intervention group did execute them in a coordinated way at the post-intervention stage. This indicates the key role performed by the (meta) cognitive reading strategy instruction (CMRSI) in consolidating the treatment group's mastery of the CRSs deemed necessary for the comprehensibility of the written input.

Based on what is stated above, it is of particular note that building up an understanding of the whole text is intertwined with the use of cognitive text-processing steps. More explicitly, granted that most CRSs can be, at times, deployed by EFL learners unconsciously in attempts to have a full grasp of the printed discourse, it is eminent to put forth the view that, since the experimental group was aware of the different types of the text-based cognitive strategies and was accustomed to their use across various written texts after the pre-intervention stage, their reading potential and thinking skills did significantly develop to a substantial level. This is indicative that strategy training can aid the learners to reach somewhat sufficient sophistication as to cognitive reading strategy use (CRSU).

As to the MRSs, it was apparent that the learners of both groups (control & experimental) did not manage to apply all the strategies that are of metacognitive nature at the pre-treatment level. Undoubtedly, the strategic processes of activating prior knowledge, self-monitoring, and rereading were the most recurrent ones depended upon by the EFL subjects in attempting to strengthen their understanding of the textual input. However, as the control group seemed

to maintain the above-cited strategies from the pre- to post-treatment, the experimental group succeeded in both persisting in the use of those strategies and adding up other enabling metacognitive 'heuristics' (e.g., goal-setting, self-questioning, recalling, summarizing).

To put it differently, the results indicate marked enhancement at level of planning, monitoring, and evaluating strategies at the post-intervention among the experimental group. The latter developed utter cognizance of these self-regulated, strategic moves (e.g., planning, monitoring, evaluating). Thus, cognitive and metacognitive reading strategy instruction (CMRSI), which was received by the strategy-instructed group throughout the whole semester (Semester One), proves to be of key importance in helping learners strategize their reading of the written discourse as prior research studies outstandingly reveal (e.g., Boulware-Gooden, et al., 2007; Dole et al., 1996; Huou & Cho, 2020; Maftoon & Tasnimi, 2014; Morshedian, et al., 2017; Palincsar & Brown, 1984; Paris, et al., 1984; Pei, 2014; Razi & Çubukçu, 2014).

In particular, despite the common use of background knowledge, as a planning strategy, among both the control and experimental groups at pre-intervention stage, only the experimental group appeared to have acquired the metacognitive planning technique of goal-setting at the post-intervention. As the strategy-trained learners (the experimental group) were made aware of what they were expected to achieve in the course of textual reading, they were able to proceed more effectively, and thereby provide valid responses to the set comprehension questions relative to the assigned written discourse. To illustrate, pinpointing the rationale for their reading and relating the text content to their background knowledge, the EFL readers of the treatment group were capable of conducting the reading process efficiently. Thus, the significance of the planning strategies, as it was emphasized by prior researchers (e.g., Afflerbach & Meuwisson, 2005), resides in the fact that they assist the EFL learners to set the stage for the execution of monitoring and evaluating strategies and to realize an effective comprehension of the written text.

As regards the monitoring strategies, the participants of both groups at the pre-intervention level made somewhat sufficient use of the strategies of self-monitoring and rereading. Indeed, it can be acknowledged that the challenging content of the assigned written texts induced the target EFL learners to check their ongoing understanding and 'reinspect' some difficult sections. Nonetheless, at the post-intervention level, the control group remained persistent in using the same meaning-checking strategies (e.g., self-monitoring, rereading), whereas the experimental subjects did improve in the recruitment of these strategies and did have recourse to self-questioning as an effective 'heuristic' to clarify the writer's/author's implied meaning.

Constituting a firm bedrock for the comprehension-checking behaviour, self-questioning assists the learners to construct a conceptually insightful understanding of the textual content. This set forth notion was explicitly highlighted by some reading scholars (e.g., Afzali, 2012; King, 1991; McCallum, et al., 2011). Thus, the adoption of the potential to raise some reflective, self-regulatory questions intended to direct and regulate the reading process can only be achieved through CMRSI which is the foundational instrument for enhancing the EFL learners' strategic behavior and cognitive performance in reading comprehension. This is suggestive of the fact that the EFL learners' monitoring strategies, namely self-monitoring

and self-questioning, can be susceptible to improvement at differing levels through instructional intervention.

In relation to the evaluating strategies, which are incarnated in content recalling and text summarization, they were insufficient, if not starkly absent, at the pre-treatment stage. Though most of the participant EFL learners from both the control and experimental groups tended to perform the summarizing process after reading the printed text assigned at the pre-intervention stage, the summaries provided were merely replication of the textual content. This is evidence that the evaluating strategies are not undertaken by the target EFL learners in an efficient manner, namely at the first-semester level. Yet, at the post-treatment stage, it was manifested that the control group did not reflect any increased recourse to recalling and summarizing. This is contrary to the retrospective data reported by the treatment group who tended to both recall and sum up the content of the studied texts. In fact, these evaluating strategies (e.g., recalling, summarizing) can reinforce the monitoring strategic steps since they are utilized to ensure that the act of proceeding in textual reading has been effectively performed.

7. Conclusion

This study is part and parcel of my Doctoral Dissertation (Defended in 2015) that experimentally targeted the effect of explicit training in cognitive and metacognitive reading strategies (RSs) on Moroccan English department university learners' strategy usage and reading achievement gains. In fact, being part of this previously defended thesis, the present small-scale research study investigated this assumed influence of explicit/direct strategy training on the EFL learners' (meta) cognitive strategy use. This was basically substantiated via the conducted semester-long experimental intervention.

It is obvious that one cannot negate the foundational perspective that EFL student-readers implement both cognitive and metacognitive strategies in analyzing EFL written passages. But, the ineffective use of CRSs and the insufficiency in the application of MRSs are really what characterize most EFL learners' approach to any written discourse dealt with at the university level. In this sense, the empirical evidence presented by the current study places into perspective the implied view that EFL learners can foster the (meta) cognitive strategic moves and that their previously acquired text-processing strategies can be subject to utter improvement through cognitive and metacognitive reading strategy instruction (CMRSI).

In light of the attained results relevant to this experimentally-predicated case study, it is worthy of stating that a number of implications can be drawn with the intent of upgrading the critical importance of (meta) cognitive reading strategy use (CMRSU) in the refinement of the EFL learners' strategic reading behavior. In essence, to the extent that it significantly enables the EFL student-readers to be self-regulated 'strategy users' in the reading process, explicit CMRSI is of great, invaluable advantage in the Reading Comprehension Course taught in the Moroccan Faculties of Letters and Human Sciences. The current findings relatable to this case study suggest that the Reading Comprehension Course, especially at the first-semester level, be reconsidered and imparted utmost significance by the concerned academics and instructors insomuch as it can provide an effective gateway into refining the

EFL learners' reading performance along the continuum of their academic studies.

Clearly, it is admitted that the Moroccan English department first-semester student-readers' regular text reading, which is performed beyond the confines of their academic programs such as reading newspapers, magazines, novels, and books, is not a sufficient condition for improving their way of analyzing, synthesizing, and interpreting the textual content in an effective fashion. This being said, the provision and assignment of well-selected reading texts by the university professor and the step-by-step analysis of the content of these texts by encouraging the learners to extensively apply the instructed RSs (e.g., cognitive, metacognitive) are important factors since this procedure can play a supplementary role in enhancing the learners' potential in making effective sense out of the included written input.

8. Limitations & Directions for Future Research

Overall, though this quasi-experimental study did put forward insightful, pertinent findings, few limitations can be acknowledged and brought to the fore. One limitation is related to the generalizability of the reached results. Indeed, since this study was restricted to the Faculty of Letters and Human sciences in Rabat, it is highly recommended that prospective research studies target other Moroccan higher education institutions in different Moroccan cities for meeting the set requirements of global representativeness.

The other limitation is concerned with the fact that the present study is not longitudinal in nature. Thus, it is fairly suggested that prospective experimental studies in the area of reading strategy training assure the durability of the reading strategy learnability among the EFL student-readers. In so doing, the determination of whether the assumed impact of CMRSI on EFL learners' strategic reading behavior is long-term or short-term could be substantiated and brought to a clear-cut perspective. In this regard, the investigation of the maintenance of (meta) cognitive RSs among the EFL learners after being exposed to a semester-long strategy-based instructional program is a much more recommended research endeavor in the field of EFL textual processing which forms a substantial part in the Reading Comprehension Course at the university level.

References

Afflerbach, P., & Meuwissen, K. (2005). Teaching and learning self-assessment strategies in middle school. In S.E. Esrael, C.C. Block, K. Bouserman, and K. Kinnucan-Welsch (Eds.), *Metacognition in Literacy Learning: Theory, Assessment, Instruction, and Professional development* (pp.141-164). London: Lawrence Erlbaum Associates.

Afzali, K. (2012). The impact of instructing self-questioning in reading literary texts. *International Journal of Linguistics*, *4*(2), 536-550. https://doi.org/10.5296/ijl.v4i2.1862

Alderson, J. C. (2000). *Assessing Reading*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511732935

Barone, D. M., & Xu, S. H. (2008). *Literacy Instruction for English Language Learners Pre-K-2*. New York: The Guilford Press.

Block, E. (1986). The comprehension strategies of second language readers. *TESOL Quarterly*, *20*(3), 463-494. https://doi.org/10.2307/3586295

Boulaware-Gooden, R., Carreker, S., Thornhill, A., & Joshi, R. M. (2007). Instruction of metacognitive strategies enhances reading comprehension and vocabulary achievement of third-grade students. *The Reading Teacher*, *61*(1), 70-77. https://doi.org/10.1598/RT.61.1.7

Brown, A. L. (1981). Metacognition: The development of selective attention strategies for learning from texts. In M. L. Kamil (Ed.), *Directions in Reading: Research and Instruction* (pp.501-529). Washington, D.C.: National Reading Conference.

Carrell, P. L. (1989). Metacognitive awareness and second language reading. *The Modern Language Journal*, *73*(ii), 121-134. https://doi.org/10.1111/j.15404781.1989.tb02534.x

Celce-Murcia, M., & Olshtain, E. (2000). *Discourse and Context in Language Teaching: A Guide for Language Teachers*. New York: Cambridge University Press.

Cook, L. K., & Mayer, R. E. (1983). Reading strategies training for meaningful learning from prose. In M. Pressley and J. R. Levin (Eds.), *Cognitive Strategy Research* (pp. 87-131). New York: Springer Verlag. https://doi.org/10.1007/978-1-4612-5519-2_4

Davies, F. (1995). *Introducing Reading*. London: Penguin Group.

Dole, J. A., Brown, K. J., & Trathen, W. (1996). The effects of strategy instruction on the comprehension performance of at-Risk students. *Reading Research Quarterly*, *31*(1), 62-88. https://doi.org/10.1598/RRQ.31.1.4

Flavell, J. H. (1971). First discussant's comments: What is memory development the development of? *Human Development*, *14*(4), 272-278. https://doi.org/10.1159/000271221

Flavell, J. H. (1981). Cognitive Monitoring. In W. P. Dickson (Ed.), *Children's Oral Communication Skills*. New York: Academic Press.

Forrest-Pressley, D. L., & Gillies, L. A. (1983). Children's flexible use of strategies during reading. In M. Pressley & J.R. Levin (Eds.), *Cognitive Strategy Research: Educational Applications* (pp. 133-156). New York: Springer-Verlag. https://doi.org/10.1007/978-1-4612-5519-2_5

Garner, R. (1987). *Metacognition and Reading Comprehension*. Norwood, New Jersey: Ablex Publishing Corporation.

Gendall, P., Menelaou, H., & Brennan, M. (1996). Open-ended questions: Some implications for mail survey research. *Marketing Bulletin*, *7*, 1-8.

Goodman, K. S. (1982). Revaluing readers and reading. *Topics in Learning & Learning Disabilities*, *1*(4), 87-93.

Gough, P. B. (1976). One second of reading. In H. Singer and R.P. Ruddell (Eds.), *Theoretical Models and Processes of Reading* (2nd ed.), pp. 509-535). Newark, DE: International Reading Association.

Grabe, W. (1991). Current developments in second language research. *TESOL Quarterly*, *25*(3), 375-406. https://doi.org/10.2307/3586977

Grabe, W., & Stoller, F. L. (2002). *Teaching and Researching Reading*. London: Pearson Education Longman.

Huo, N., & Cho, Y. (2020). Investigating effects of metacognitive strategies on reading engagement: Managing globalized education. *The Journal of Industrial Distribution & Business*, *11*(5), 17-26. https://doi.org/10.13106/JIDB.2020.VOL11.NO5.17

Kern, R. G. (1989). Second language reading strategy instruction: Its effects on comprehension and word inference ability. *The Modern Language Journal*, *73*(ii), 135-149. https://doi.org/10.1111/j.1540-4781.1989.tb02535.x

King, A. (1991). Effects of training in strategic questioning on children's problem-solving performance. *Journal of Educational Psychology*, *83*(3), 307-317. https://doi.org/10.1037/0022-0663.83.3.307

LaBerge, D., & Samuels, S. J. (1985). Toward a theory of automatic information processing in reading. In H. Singer, and R. B. Ruddell (Eds.), *Theoretical Models and Processes of Reading* (3rd edition, pp.689-718). Newark, Delaware: International Reading Association.

Lawrence, L. J. (2007). Cognitive and metacognitive reading strategies revisited: Implications for instruction. *The Reading Matrix*, *7*(3), 55-71.

Maftoon, P., & Tasnimi, M. (2014). Using self-regulation to enhance EFL learners' reading comprehension. *Journal of Language Teaching and Research*, *5*(4), 844-855. https://doi.org/10.4304/jltr.5.4.844-855

McCallum, R. S., Krohn, K. R., Skinner, C. H., Hilton-Prillhart, A., Hopkins, M., Waller, S., & Polite, F. (2011). Improving reading comprehension of at-risk high-school students: The art of reading program. *Psychology in the Schools*, *48*(1), 78-86. https://doi.org/10.1002/pits.20541

Miholic, V. (1994). An inventory to pique students' metacognitive awareness of reading strategies. *Journal of Reading*, *38*(2), 84-86.

Mokhtari, K., & Reichard, C. A. (2002). Assessing students' metacognitive awareness of reading strategies. *Journal of Educational Psychology*, *94*(2), 249-259. https://doi.org/10.1037/0022-0663.94.2.249

Montague, M., & Tanner, M. L. (1987). Reading strategy groups for content area instruction. *Journal of Reading*, *30*(8), 716-723.

Morshedian, M., Hemmati, F., & Sotoudehnama, E. (2017). Training EFL learners in self-regulation of reading: Implementing an SRL model. *Reading and Writing Quarterly*, *33*(3), 290-303. https://doi.org/10.1080/10573569.2016.1213147

Msaddek, M. (2015). *Moroccan EFL Students' Learning of Cognitive and Metacognitive Reading Strategies: Rabat FLHS Semester One Students as a Case Study* (Unpublished

Doctoral Dissertation). Faculty of Letters and Human Sciences, Mohamed V University, Rabat, Morocco.

Msaddek, M. (2016). The impact of metacognitive strategy training on comprehension monitoring among Moroccan EFL university learners. *Arab World English Journal* (AWEJ), *7*(4), 139-154. https://doi.org/10.24093/awej/vol7no4.10

O'Malley, J. M., & Chamot, A. U. (1990). *Learning Strategies in Second Language Acquisition*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139524490

Olshavsky, J. E. (1976-1977). Reading as a problem solving: An investigation of strategies. *Reading Research Quarterly*, *12*(4), 654-674. https://doi.org/10.2307/747446

Palincsar, A. S., & Brown, A. L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction*, *1*(2), 117-175. https://doi.org/10.1207/s1532690xci0102_1

Paris, S. G., Cross, D. R., & Lispon, M. Y. (1984). Informed strategies for learning: A program to improve children's reading awareness and comprehension. *Journal of Educational Psychology*, *76*(6), 1239-1252. https://doi.org/10.1037/0022-0663.76.6.1239

Paris, S. G., Wixson, K. K., & Palincsar, A. S. (1986). Instructional approaches to reading comprehension. *Review of Research in Education*, *13*(1), 91-128. https://doi.org/10.3102/0091732X013001091

Pei, L. (2014). Does metacognitive strategy instruction indeed improve Chinese EFL learners' reading comprehension performance and metacognitive awareness? *Journal of Language Teaching and Research*, *5*(5), 1147-1152. https://doi.org/10.4304/jltr.5.5.1147-1152

Pressley, M., & McCormick, C. B. (1995). *Advanced Educational Psychology for Educators, Researchers, and Policymakers*. New York: Harper Collins.

Rayner, K., & Pollatsek, A. (1989). *The psychology of Reading*. Englewood Cliffs, NJ: Prentice Hall.

Razi, S., & Çubukçu, F. (2014). Metacognition and reading: Investigating intervention and comprehension of EFL freshmen in Turkey. Procedia - *Social and Behavioral Sciences*, *158*, 288-295. https://doi.org/10.1016/j.sbspro.2014.12.090

Resnick, L. B., & Weaver, P. A. (1979). *Theory and Practice of Early Reading, Volumes I-III***.** Hillsdale, NJ: Erlbaum.

Samuels, S. J., & Kamil, M. L. (1984). Models of the reading process. In P.D. Pearson, R. Barr, M.L. Kamil & P. Mosenthal (Eds.), *Handbook of Reading Research* (vol. 1, pp. 185-224). New York: Longman.

Schwartz, S. (1984). *Measuring Reading Competence: A Theoretical-prescriptive Approach*. New York & London: Plenum Press. https://doi.org/10.1007/978-1-4899-0387-7

Stewart, O., & Tei, E. (1983).Some implications of metacognition for reading instruction. *Journal of Reading*, *27*(1), 36-43.

Van Den Broek, P., & Kremer, K. (2000). The mind in action: What it means to comprehend during reading. In B. M. Taylor, M. F. Graves, & P. van den Broek (Eds.), *Reading for Meaning: Fostering Comprehension in the Middle Grades* (pp. 1-31). New York: Teachers College Press.

Vellutino, F. R. (2003). Individual differences as sources of variability in reading comprehension in elementary school children. In A.P. Sweet and C.E. Snow (Eds.), *Rethinking Reading Comprehension* (pp. 51-81). New York: The Guilford Press.

Williams, J. P. (2007). Literacy in the curriculum: Integrating text structure and content area instruction. In D.S. McNamare (Ed.), *Reading Comprehension Strategies: Theories, Interventions and Technologies* (pp. 199-219). New York & London: Lawrence Erlbaum Associates.

Wood, G. (1983). *Cognitive Psychology: A Skills Approach*. California: Cole Publishing Company.

Appendix

Retrospective Questionnaire

-Personal information:

a- Are you ☐ male or ☐ female?

b- Age: .....

c- Number of years of studying English: ☐ Three years ☐ Four years ☐ Five years ☐ Over five years

Please, answer these questions:

1-What are the main techniques that you used during reading the text to comprehend the meaning?

.....
.....
.....
.....
.....

2-Did you predict the included meaning before reading the assigned written text?

☐ Yes ☐ No

3-If so, how did you predict the meaning included in the text ?

☐ Noticing the text title ☐ Reading the first paragraph of the text
☐ Reading the first sentence of the text ☐ Knowing the text genre
☐ Paying attention to some key concepts
Others:.....

.....

.....

4-How did you understand the meaning of some concepts (words) in the written text?

☐ Associating the words with other ones in the text
☐ Reading the whole sentence to understand the meaning of the concepts/words
☐ Guessing the meaning of the words from the context
☐ Ignoring the difficult words
☐ Finding the similarity of meaning in another language
Others: .....

.....

.....

5-How did you understand the meaning of some sentences in the written text?

☐ Relating the sentences to other ones in the text
☐ Reading the whole paragraph to understand the meaning of the sentences
☐ Guessing the meaning of the sentences from the context
☐ Not paying attention to the complex and difficult sentences
Others: .....

.....

.....

6-Did you select the main ideas while you were reading the assigned text?

☐ Yes ☐ No

7-If so, how did you select the major ideas that are contained in the text?

☐ Underlying the key ideas ☐ Writing down the major ideas
☐ Highlighting the major ideas ☐ Memorizing the key ideas

Others:.....

.....

.....

8- Did you underline any key words or sentences that are included in the text?

☐ Yes ☐ No

9- Did you take note of some major ideas and terms while you were processing the the content?

☐ Yes ☐ No

10- Did you form any mental images about the textual content while you were reading?

☐ Yes, to a large extent ☐ Yes, to some extent ☐ No

11- Did you depend on paraphrasing the words and sentences in order to facilitate the process of understanding?

☐ Yes ☐ No

12-If so, how did you paraphrase the meaning of some words and sentences that are included in the text in order to achieve an effective comprehension?

(You can choose more than one item)

☐ Attempting to come up with synonymous words
☐ Translating the words & sentences into Arabic (L1)
☐ Relating each word and each sentence with the subsequent one
☐ Translating the words & sentences into French (L2)
☐ Translating the words and sentences into other languages (e.g., Spanish, German, Italian, Amazigh...)
☐ Reading the text without paraphrasing the words and sentences

Others:.....
.....
.....

13-Did you set any goals before beginning reading the written text?

☐ Yes ☐ No

14- If so, please list briefly some of the goals that you actually set before reading the text.

-.....
-.....
-.....

15-How important did you find the role of your previously-acquired knowledge in the process of understanding the content of the text?

☐ Very important ☐ Important ☐ Not important

16-To what extent did you depend on your prior knowledge to facilitate the comprehension of the text?

☐ To a large extent ☐ To some extent ☐ To a limited extent

17-What are the major techniques that you used to check your comprehension of the written text during reading?

-.....
.....
.....
.....

18-How did you deal with the difficult words and sentences during reading the given written text?

(You can choose more than one item)

☐ Reading slowly
☐ Guessing the meaning from the context
☐ Stopping for a while to check understanding
☐ Rereading the previous sentences
☐ Rereading the previous paragraph
☐ Ignoring the difficult words and sentences and continue your reading

Other techniques: -.....
-.....
-.....

19-How did you deal with the difficult paragraphs during reading the written text?

☐ Ignoring the difficult paragraphs and reading subsequent ones
☐ Rereading the difficult paragraphs many times

☐ Rereading the whole text over again

Other techniques:-.....

-.....

-.....

20-During your reading, did you engage yourself in the process of self-questioning about some statements, concepts and ideas that are presented in the text?

☐ Yes ☐ No

21-If so, briefly provide a sample of the questions that you asked yourself during the process of reading the assigned text.

-.....

-.....

-.....

-.....

22-How many times have you read the assigned text?

☐ Once ☐ Twice ☐ Three times ☐ Over three times

23-Did you evaluate your overall understanding of the written text after finishing the reading process?

☐ Yes ☐ No

24-If so, what were the major techniques that you used to evaluate the effectiveness of your understanding of the presented text? (Please explain)

-.....

.....

.....

.....

.....

Thank you!

Notes:

Note 1. The retrospective questionnaire (RQ) was uniquely designed by the researcher in collecting the data. (Source: Msaddek, 2015)

Note 2. A set of questions that targeted other variables were removed from the original retrospective questionnaire (RQ) included in my unpublished Doctoral Dissertation.