Explicit Instruction of Memory vs Cognitive Strategies and Reading Comprehension: An Empirical Study with IELTS Candidates

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Abstract

Research in reading comprehension associates the assumption that readers' attributes may influence reading comprehension; different readers may process the same text in different ways, depending on their purposes, motivation, attitudes, interests, background knowledge, and the strategies they use. The present study attempted to investigate the impact of teaching cognitive and memory strategies on male and female IELTS candidates' reading comprehension. To carry out the study, the researcher selected a sample of 88 male and female EFL learners, who attended IELTS preparation classes in Afarinesh English Language Institute regularly. The participants were randomly assigned into three groups; namely, two experimental groups and a control group. Eight memory and cognitive strategies were taught explicitly in the two experimental groups respectively during the treatment, whereas the current usual techniques were being used in the control group. The results showed that the experimental groups outperformed the control group in reading comprehension. The difference between the mean scores of the two experimental groups was not statistically significant. That is, instructing cognitive and memory strategies have had somehow similar impact on the IELTS candidates' reading comprehension. Finally, the participants' gender as a moderator variable did not make a significant difference in their reading comprehension.

Keywords

explicit instruction, memory and cognitive strategies, reading comprehension

1. Introduction

There is an essential challenge in reading-based studies that researchers cannot easily define L2 reading. A completely devised model of reading ought to show what is reading, what happens during reading, what levels of processing occur, and for what purposes. Researchers have arrived at some understanding

of what successful first language reading consists of, but these understandings have influenced the studies in L2 reading during the last three decades (Bernhardt, 2000; Grabe & Stoller, 2002).

It is clear to everybody that reading is very important; however, there has been much dispute over the question of the reading process (Farhady, 1998). During the reading process, there is an interaction between the background knowledge of the reader and linguistic knowledge of the text (Alptekin, 2006). While learners are reading a text, they comprehend meaning. Thus, reading is a gradual, developmental, and time-consuming process which is very complex and involves a variety of skills. During this complex process, readers use strategies to grasp and interpret meaning, which is very crucial to them. Scholars have set three views to reading, including a) bottom-up processing (Smith, 1978, 1986) in which readers analyze the text to extract meaning from it; b) top-down processing (Goodman, 1967) in which readers bring meaning to the text from their backgrounds. Their schemata provide them with mentality to understand the text; and c) interactive processing (Rumelhart, 1977; Stanovich, 1980) in which meaning is the product of the interaction between the linguistic knowledge of the text and the background knowledge of the reader.

The two processes, that is, top-down and bottom-up process, explain two different processing directions during reading; from the reader to the text, and from the text to the reader (Carrell, 1991; Grabe, 1997; Nuttall, 1996). The conceptually-driven processes were recognized as higher-level processes, such as arriving at meaning at whole text-level and using schemata or background knowledge to bring meaning to the text. The data-driven processes included so-called lower-level processes, such as identifying words and arriving at meaning at word or phrase level. In the realm of L2 reading research, many researchers advocated the interactivity of reading processes (Carrell, 1985; Carrell, Devine, & Eskey, 1988; Bernhardt, 2000; Grabe & Stoller, 2002; Urquhart & Weir, 2014).

The interactional model is considered as the most distinguished theoretical framework for reading. Based on this model, reading is the output of the interaction between the reader and the text. Comprehension may vary among readers depending on the text features and reader characteristics. Text includes features of discourse and grammar, while reader characteristics include not only language proficiency, attitude, and motivation, but also background knowledge. The context features such as physical surroundings, and the allocated time are also important in reading process (Alderson, 2000; Burton, 1987). These two perspectives are placed on a continuum on which different combinations of strategies involved in top-down and bottom-up processing are involved in reading process (Finkbeiner, 2001).

Reading comprehension has been viewed as the outcome of the interaction between the text, setting, reader, reader background, reading strategies, the L1 and the L2, and reader decision making since 1990s. The two approaches of top-down and bottom-up for reading processing and the strategy use were the issues for reading research (Brantmeier, 2002).

In effective learning and teaching, the role of learner and learning strategies has been emphasized by the researchers. The use of strategies as one of the most important factors for language learning has been emphasized; hence, different methods have highlighted strategy instruction in many contexts (Oxford,

Crookall, Cohen, Lavine, Nyikos, & Sutter, 1990; Dreyer & Nel, 2003).

Based on the traditional techniques used for teaching reading, the students are encouraged to read the text, review the words in the text, and answer the questions, which are not effective (Farrell, 2001). This way is not effective in that we just require the students to comprehend the text and answer the comprehension questions. In fact, we are testing their comprehension ability rather than teaching them how to read. To emphasize the way to teach reading, some researchers have proposed reading strategy instruction (Carrell, 1998; Klingner & Vaughn, 2000).

The strategies intended to be examined here are a set of memory and cognitive strategies. These two categories, according to Oxford (1990) have been classified into some separate strategies. Memory strategies are such as grouping, associating or elaborating, placing new words into a context, using imagery, semantic mapping, using keywords, structured reviewing, and using mechanical techniques. Cognitive strategies are such as highlighting, summarizing, taking notes, transferring, translating, analyzing expressions, getting the idea quickly, and recombining. From among all memory and cognitive strategies, eight strategies were selected to be instructed to IELTS candidates due to practicality reason. These strategies were taught during IELTS preparation course and then incorporated by the participants while reading passages in IELTS test.

As for the gender differences, there is no doubt that psychological differences between males and females are quite many, as confirmed in many studies (Brantmeier, 2003; Cameron, 1992; Pae, 2003; Tavakoli & Sayadian, 2012). Although unanimity can hardly be seen in the findings of such studies, the bottom line seen in all of them is that gender can be of some effect on the way of learning a foreign language and all the skills and subskills of it are under the influence of this characteristic. That is the reason why it has been taken into consideration in the present study.

There is a controversy between scholars in the way children develop comprehension. Based on the ideas of some researchers (e.g., Denton & Fletcher, 2003), children develop their comprehension ability as naturally as young children do in their mother tongue. However, other scholars (e.g., Pressley, 2006; Pressley, Wharton-McDonald, Mistretta-Hampston, & Echevarria, 1998) claim that children cannot develop their reading comprehension merely through reading more text. To defend the latter position, some others (e.g., Gough & Hillinger, 1980; Wren, 2002) believe that for students to understand what they read, they should be taught strategies explicitly. Pressley et al. (1998) stated that if an individual learn and apply even one strategy, his comprehension will improve. If multiple strategies are learned and utilized by an individual, the comprehension will significantly improve.

One more point in reading instruction is when it should start, and how long it should last. According to Boulware-Gooden, Carreler, Thornhill and Joshi (2007), when children learn to decode, reading instruction should not stop but continue to the stage in which children develop multiple strategies to comprehend various texts they read. Kragler and Martin (2009) argue that "strategic control over comprehension may develop quite early in children who have had more advanced literacy activities" before they enter kindergarten (p. 514). To other researchers, the instruction of strategies can take place

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even before children master decoding (Smith, 2006; Dori, 2007). It is important that teachers teach effective reading comprehension strategies implicitly through involving children in dialogs during reading aloud before they learn to read.

There are different views on reading strategy instruction. Nash-Ditzel (2010) maintains that teachers can use modeling not only to instruct strategies, but also how, when, and where to use each strategy. Proficient readers use a collection of strategies automatically, while less proficient readers are often unaware of the fact that good readers use a variety of strategies to make meaning and repair understanding while reading. As Iwai (2011) claims, children employ "direct explanation of strategies" which is most frequently used in literature as explicit strategy instruction (p. 158). With the same token, Gooden (2012) believe that "strategy instruction encourages students to think about their mental processes and execute specific strategies to interact with text" (p. 17). Researchers (e.g., Iwai, 2011; Israel, 2007; Pressley & Afflerback, 1995; Takallou, 2011) unanimously agree that readers utilize these strategies before, during, and after reading. Some of these strategies can be used before, during and after reading like *predicting*, whereas other strategies are used during reading, like *guessing the meaning of unfamiliar words from the context*. It is the teacher who should teach the students when and where to employ which strategy.

Based on the researchers' experience of teaching reading in IELTS preparation courses, lack of reading comprehension can be mainly attributed to unfamiliarity with effective reading strategies. When students are pressed to read, they often select ineffective and inefficient strategies. This is due to their low level of reading strategy knowledge and lack of meta-cognitive control (Dreyer, 1998). Unfortunately, there is little efficient instruction in this regard. It is widely seen that IELTS reading instruction is simply limited to the assignment of a reading passage, accompanied by a number of questions with various formats. This has raised much complaint about the quality of IELTS instruction. On the other side, reading strategy instruction is based on the idea that even students with poor comprehension ability can successfully be taught to apply the strategies used by good readers (Farrell, 2001; O'Malley & Chamot, 1990; Oxford, 1990). It is claimed that when poor readers learn to apply these strategies, their reading comprehension improves (Farrell, 2001). But very few teachers, especially those dealing with IELTS instruction, incorporate strategy teaching into their teaching career.

2. Method

2.1 Participants

From among the original number (100) of the participants enrolling in Afarinesh Language Institute, 88 were selected. They were the homogeneous ones who were selected based on a language proficiency test, the one administered by the institute. The participants who fell one standard deviation below or above the mean were included in the sample. Accordingly, a few candidates were excluded and the study proceeded with 88 ones. Both male and female were included in the sample to consider gender as a moderator variable. The selected participants were randomly assigned into three groups. The first experimental

group (30 learners) received instruction on memory strategies, while the second experimental group (32 learners) received instruction on cognitive strategies and the control group (26 learners) used the conventional techniques for practicing IELTS reading samples.

2.2 Instruments

Three instruments were used in the present study. The first one was a proficiency test which was the placement test of the institute. The proficiency test helped the researcher select homogeneous candidates for the study. The second instrument was a typical IELTS reading pre-test, which was administered before the intervention since the participants were supposed to be homogeneous in reading comprehension. The third instrument was an identical IELTS reading test used as a posttest which was administered to the participants after the treatment to see if it would have any impact on the participants' performance in IELTS reading comprehension.

2.3 Materials

The materials taught to the three groups were 16 IELTS reading passages. Following the design of the study, in the first group, the reading passages were taught while eight memory strategies were taught explicitly as the treatment. In the second experimental group, however, eight cognitive strategies were taught explicitly while the participants practiced reading passages. In the control group, the researchers attempted to use the conventional techniques while teaching IELTS reading samples. It is worth mentioning that all reading passages were selected randomly from the IELTS sample reading passages and were the same for the three groups.

2.4 Procedure

After selecting the homogeneous participants through administering the placement test of the institute, they were randomly assigned into three groups. Then, a reading comprehension pretest was administered to them to check their homogeneity in reading comprehension before the treatment.

In the first experimental group, eight memory strategies were taught explicitly, which took 16 sessions. The memory strategies of *grouping, associating or elaborating, placing new words into a context, using imagery, semantic mapping, using keywords, structured reviewing, and using mechanical techniques* were taught explicitly to the participants. They learned one strategy every session and practiced to apply the strategies while they practiced reading IELTS passages. The candidates were provided with brief awareness of using the strategy because the purpose was not to have blind training of the strategy; hence, they were expected to learn the strategy consciously, and be able to use it practically in different contexts. In the second experimental group, however, eight cognitive strategies were explicitly instructed to the candidates. The cognitive strategies of *highlighting, summarizing, taking notes, transferring, translating, analyzing expressions, getting the idea quickly, and recombining* were taught to them. Like the first experimental group, the participants learned each strategy in a session, but practiced them spirally during 16 sessions while practicing IELTS reading comprehension passages. They were provided with some awareness about using each strategy practically in new situations.

The third group, that is, the control group received the conventional techniques which are regularly

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used in IELTS reading classes, mainly including skimming and scanning as the common practice in IELTS reading courses. Their main focus was to understand the passages and be able to answer the reading comprehension questions. In fact, in the control group, the prevalent current techniques in teaching reading comprehension were utilized. The candidates practiced to skim the main ideas of the passages, scan the specific information from the texts to be able to answer the comprehension questions, and even sometimes they could read between the lines to discuss the reading theme in their class. They did not practice memory and/or cognitive strategies as their counterparts in the two experimental groups specifically did.

After implementing the treatment, an IELTS reading posttest was administered to the three groups to measure their reading comprehension. The test was an identical test compared with the pretest in order to minimize the practice effect. The participants experienced the same time restriction to take the tests based on a uniform procedure to eliminate any fluctuation due to the test rubrics. The test scores were analyzed to compare the mean scores among the three groups.

3. Results

3.1 The Analysis of the Pretests

To find out whether the three groups were homogeneous in Language Proficiency Test (LPT) and reading comprehension, the two tests of language proficiency and reading pretest were administered to the participants.

Table 1. ANOVA Results for the Pretests

		Sum of Squares	df	Mean Square	F	Sig.
	Between Groups	39.79	2	19.90	1.499	.229
LPT	Within Groups	1128.21	85	13.27		
	Total	1168.00	87			
	Between Groups	16.33	2	8.16	.638	.531
Reading1	Within Groups	1087.38	85	12.79		
	Total	1103.71	87			

The results of ANOVA showed that the difference between the three groups in terms of their general English language ability and reading comprehension was not statistically significant. The three groups were homogeneous in their English language proficiency in general and reading comprehension in particular. Thus, the researchers could start presenting the treatment to the candidates. The treatment was of two types: teaching eight memory strategies to one experimental group, and eight cognitive strategies to the other experimental group.

3.2 The Analysis of the Reading Post-Test

When the treatment was over, a reading posttest was administered to the participants in the three groups. The results of ANOVA indicated that the difference between the mean scores in reading was statistically significant.

Table 2. ANOVA Results for Reading Posttest

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	582.34	2	291.17	28.030	.000
Within Groups	882.97	85	10.38		
Total	1465.38	87			

Accordingly, there was a need for a Post Hoc multiple-comparisons to show where the significant difference is. The significant difference was between the control group and the two experimental groups. That is, the explicit teaching of memory and cognitive strategies in the two experimental groups made a significant difference in the participants' reading comprehension scores.

Table 5. A Post Hoc (Multiple Comparisons) Analysis for the Reading Posttest

(I) groups	(J) groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Exp group (memory strategies)	Exp group (cognitive strategies)	.271	.819	.741	-1.35	1.90
	Control group	5.773	.863	.000	4.05	7.49
Exp group (cognitive strategies)	Exp group (memory strategies)	-.271	.819	.741	-1.90	1.35
	Control group	5.501*	.850	.000	3.80	7.19
Control group	Exp group (memory strategies)	-5.773*	.863	.000	-7.49	-4.05
	Exp group (cognitive strategies)	-5.501	.850	.000	-7.19	-3.80

The results of multiple comparisons showed that the two experimental groups did not show a significant difference in their reading comprehension scores. That is, the two different types of strategies had similar effect on the participants' reading comprehension. The instruction of these two types of strategies improved the participants' reading comprehension, but when compared to each other, did not make a significant difference in reading comprehension.

The participants' gender was taken into analysis as a moderator variable to find out whether male and female participants show any significant difference in their reading comprehension. A one-way ANOVA was utilized to detect whether the difference between male and female candidates is statistically significant or not.

Table 6. ANOVA Results for Reading Pre- and Post-Test by Gender

		Sum of Squares	df	Mean Square	F	Sig.
	Between Groups	15.82	1	15.82	1.251	.267
Reading1	Within Groups	1087.89	86	12.65		
	Total	1103.71	87			
	Between Groups	.034	1	.03	.002	.965
Reading2	Within Groups	1465.28	86	17.03		
	Total	1465.31	87			

As it is shown, the results of ANOVA disclosed that male and female candidates were not statistically different in their reading comprehension pretest and posttest. The values computed for each of the two measurements (sig=0.267, 0.965) are higher than 0.05; therefore, the difference is not statistically significant.

4. Discussion

There were three groups participating in the present study. In the first experimental group, eight memory strategies were taught, which outperformed the control group in reading comprehension. In the control group, learners used to practice the texts traditionally. In the second experimental group, in which the learners practiced eight cognitive strategies during the treatment proved to be better readers. The two experimental groups showed an improvement in their reading comprehension, but the inter-group difference was not statistically significant. In fact, the explicit instruction of memory and cognitive strategies influenced the candidates' reading skill similarly. Thus, the Strategies-Based Instruction (SBI) proved to be decisive in reading comprehension among IELTS candidates. Based on their test results, the candidates' gender did not make a difference; that is, both female and male EFL learners performed similarly in IELTS reading comprehension tests.

Harris (2003) compared four training models-O'Malley and Chamot (1990), Oxford (1990), Chamot et al. (1999) and Grenfell and Harris (1999) and also additional models, such as in Macaro (2001) and Cohen and Chi (2002), and proposed the explicit strategy instruction. It is worth mentioning that strategy training has considerable commitment among researchers. Educators consider reading strategies as some plans for solving problems encountered in constructing meaning from the text (Duffy, 1993). Reading strategies range from bottom-up vocabulary strategies, such as looking up an unknown word in the dictionary, to more comprehensive actions, such as connecting what is being read to the reader's background knowledge.

The outcomes of the present study confirmed the findings of the previous studies. Swain (2000) believes that strategy training will be effective if it involves verbalizing the strategies employed together with opportunity to use the strategies explicitly in the context of communicative activity. Kitajima (1997)

suggested that students could successfully learn to use a strategy presented in an instruction program, and at the same time, their comprehension might be improved, although a causal link could not be detected. Carrell, Pharis and Liberto (1989), while investigating the impact of two metacognitive strategy approaches on reading comprehension, showed that both types of intervention improved reading comprehension.

The results of the present study highlighted the findings of some other previous studies in which Strategies-Based Instruction (SBI) was the concern of the researchers, such as Kusiak (2001) who carried out a metacognitive strategy-based instruction program, and proved how these two variables-metacognition and comprehension were related to L2 language competence. Also, a complex Strategy-Based Instruction program was carried out by Dreyer and Nel (2003), in which at the onset of the project, at-risk students apparently lacked metacognitive strategies for monitoring and evaluating their comprehension in order to deploy cognitive strategies to deal with reading problems. However, by the end of the program, both successful and at-risk students in the experimental group achieved significantly higher comprehension scores than did the control group.

Some other studies have had the same outputs as the present study. Dreyer and Nel (2003) performed a study to show the effectiveness of reading strategy instruction and indicated that those students who received strategic reading instruction obtained both statistically significant scores in three reading comprehension measures than did the students in the control group. Phakiti (2006) examined the relationship between memorization strategy and reading performance, and found that it can affect reading comprehension. In another study by Hamdan, Ghafar, Sihes and Atan (2010), the use of memorization strategies in reading comprehension was examined. The results revealed that this strategy can be of some effect on reading comprehension.

Strategies instruction has been discussed in general (e.g., Chamot & O'Malley, 1994), but in TESOL little has been published that relates to teaching reading strategies in an ongoing classroom reading program. However, in the L1 field, this is not the case, and one solution is to adapt methods that have been found successful in L1 teaching to an ESL situation. In the teaching approach of Brown and Palincsar (1989), for example, students were taught four reading strategies of summarizing, predicting, clarifying and asking questions, which were tried with L2 learners and have been found helpful (Cotterall, 1990; Hewitt, 1995).

Contrary to the results of the present study, some previous studies suggested the explicit instruction of strategies for EFL learners. There isn't complete uniformity among researchers about teaching learner strategies. As Macaro (2006) pointed out, the lack of standardization of either the intervention packages or the manner in which learning was assessed makes it difficult to reach any firm conclusion regarding the effectiveness of strategy training. In an experiment done by Bialystok (1983b), the strategy training proved to be less effective in promoting either comprehension or vocabulary acquisition than the other two conditions in his study. Also, O'Malley and Chamot (1990) doing a study on the effect of strategy training on the learners' performance on a listening and a speaking task, found no significant difference

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among the experimental groups. They found that a group taught "functional planning" (a metacognitive strategy) outperformed both the control group and the other experimental group taught "cooperation" (a social/affective strategy) in the speaking task. There was no effect for strategy training in the listening task. In a study, on the impact of strategy-based instruction on speaking, Cohen and Weaver (2005) found that the experimental group outperformed the control group on only one of the three oral tasks in the posttest.

There are also some challenges among other researchers about strategies-based instruction. Dornyei (2005) claims that although the available strategy and training materials are generally creative and impressive, it is not clear whether the benefits of their explicit instruction warrant the time and effort spent on them in comparison to spending the same amount of creative energy designing ordinary learning activities. In a study, Kern (1989) organized an instruction program of strategies for word recognition, inferring meaning, and engaging in synthesis-of-meaning, and found that only the lower ability students achieved a significant gain in comprehension. Raymond (1993) in a strategy-based instruction claimed that the intervention group reported greater use of these strategies than did the control group, but the intervention students achieved higher comprehension results on only one of the post-intervention texts. According to Raymond (1993), these findings pointed to the complex interaction of strategy use, text content, reader interest, background knowledge, and reader perceptions of text difficulty. Still in another study, Bimmel, Van den Bergh and Oostdam (2001) reported a strategies intervention project, in which the results of the intervention group of twelve 15-year-olds were compared to those of the control group of L2. Improvement was found in the intervention group's L1 reading comprehension, but the results for L2 reading were not ascertainable. Also, in Gu, Hu and Zhang's (2005) study, they claimed that strategy instruction among young learners is of much difficulty, and the little will be gained in teaching strategies to young learners.

5. Conclusion

Based on the results of the study, the two experimental groups outperformed the control group in reading comprehension. It is concluded that the explicit instruction of cognitive and memory strategies was effective and made a difference in the posttest results. The difference in the results can only be attributed to the treatment. This indicates that reading comprehension can be taught and explicit strategy instruction is one of the effective ways of teaching reading comprehension.

Essentially, the ability to comprehend is a key characteristic of a good reader. Therefore, it is important for teachers to support their students in understanding what they read. One of the ways in which teachers can support their students' reading comprehension is through explicit strategy instruction. It involves making students cognitively aware of the thinking processes good readers have as they engage in text and providing them with specific strategies they can use to develop and repair their comprehension as they read a wide variety of texts.

The strategy-based instruction has been the concern of L2 reading researchers during the last decades.

The focus has been to improve the readers' reading comprehension through using more effective strategies. The choice of strategies to be taught depends on many factors, such as the researchers' conceptualization of strategies, the readers' cognitive processing, individual characteristics, cultural background, purpose of the course, and characteristics of the particular teaching and learning environment. The choice of strategies also depends on the type of text being read. Many ESL students find expository texts more challenging than narrative texts because they have specific text structures and contain technical vocabulary, and require readers to have background knowledge (Reutzel & Cooter, 2007). All these factors have been seen to impact on strategy choice and employment. Researchers have attempted to explore strategy types and have linked them to the proficiency levels of the learners. They have also recognized that a single reader may use many types of strategies in L2 reading.

Since reading in a foreign or second language is both a language and a reading problem (Hudson, 2007; Koda, 2007), students can be assisted to form good reading habits by explicitly teaching them reading strategies that will help them improve their comprehension abilities. Students need to associate reading not with effort or failure but with success. It is important to note that students do not naturally acquire the target strategies through implicit learning. That is, students learn reading strategies and how to use or apply them in reading through explicit instruction.

Explicit strategy instruction is worth being implemented in classrooms, if not to support all learners, at least to support some. This study should encourage teachers to ask themselves the following question: How can I use explicit strategy instruction in my classroom to make my students more confident, effective and strategic readers.

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