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The Effect of Strategy Instruction Based on the Cognitive Academic Language Learning Approach over Reading Comprehension and Strategy Use

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Abstract

This study investigates the effects of reading strategies instruction based on the Cognitive Academic Language Learning Approach over students' skill to comprehend what they read in French and their use of reading strategies. It has an action research design. Eighteen students studying at French Preparatory Program at Eskisehir Osmangazi University, during the academic year of 2009-2010 participated in the study. Data for the study was collected through Reading Comprehension Achievement Test, Reading Strategy Scale, and Think-Aloud Technique. Findings indicate that strategies instruction had positive effects on students' reading comprehension in French and their use of reading strategies. After strategy instruction, students employed more frequently several reading strategies and alternated the strategies they used. In conclusion, the Cognitive Academic Language Learning Approach may be implemented as an effective model in teaching reading strategies for French as a foreign language at higher education level.

Keywords: cognitive academic language learning approach, French, reading strategies instruction, foreign language

1. Introduction

The core of effective teaching is highly based on understanding the nature of learning. Thus, figuring out the components included in an effective reading process, the behaviors displayed by an effective reader during this process, and how individuals learn a foreign language plays a crucial role for teaching reading in a foreign language.

Being an action carried out quite often on a daily basis but not questioned that frequently, reading not only requires efficient and congruous use of many processes such as attention, perception, and comprehension, but also it covers both cognitive and meta-cognitive processes (Block & Pressley, 2002, p. 3; Grabe & Stoller, 2002, pp. 4-10; Kern, 1989, p. 135). Anderson (1999, p. 1) prescribes reading as an active and fluent process which includes the interaction between the text and the reader during comprehension. According to Grabe (2009, p. 14), reading is a rapid, efficient, comprehending, interactive, strategic, flexible, purposeful, evaluative, and linguistic process including learning. The interactive nature of reading is especially underlined by interactive models that explain reading comprehensively. Within the interactive models, both interaction between the reader and the text and the one between bottom-up and top-down reading processes are highlighted. Therefore, it wouldn't be wrong to state that an individual should apply both bottom-up and top-down processes for an active reading; in other words, s/he should employ strategies that would help not only decode the knowledge in the text but also relate his/her background knowledge to the text and interpret the text.

In a broad sense, strategy means a plan or a conscious action addressing a specific goal (Oxford, 1990, p. 8). Carrell, Gaydusek and Wise (1998, p. 97) describe reading strategies as "actions that readers select and control to achieve desired goals or objectives". Among the classifications of reading strategies in literature, two major categories are worth noting. One of them is the holistic/global (top-down strategies, text-level strategies) versus local strategies (bottom-up strategies, word-level strategies) and the other is the cognitive versus meta-cognitive strategies (Koda, 2007, p. 207). Holistic/global and local strategies are a result of the binary division between

top-down and bottom-up reading models. Holistic/global strategies include the ones that are applied to understand and monitor the comprehension during reading such as predicting the content and noticing the structure of the text, integrating and questioning the knowledge, and using background knowledge. On the other hand, local strategies are those used to figure out a specific linguistic unit such as questioning the meaning of a lexical item and clearing the unknown vocabulary (Block, 1986). The distinction between cognitive and meta-cognitive strategies, which serves as the basis of the current study, came out as a result of the research on meta-cognition. Meta-cognitive strategies are those carefully planned and used by the reader to monitor and manage the reading process such as defining the purpose of reading, reviewing the text in terms of length and structure, and making use of tables and charts in the text. On the contrary, cognitive strategies are the ones utilized in order to solve comprehension problems regarding the text such as guessing the meaning of unknown vocabulary from the context and re-reading the text for clarification (Anderson, 1999, pp. 82-83; Chamot & El-Dinary, 1999; Shoerey & Mokhtari, 2001, p. 436).

In Turkey, research on reading strategies points that students are in need of training on reading strategies. For example, in a study conducted by Ozkan Gurses and Adiguzel (2011), higher education students learning French were identified not to alternate reading strategies at a sufficient level. Similarly, other studies—especially focusing on students learning English—indicate that they mostly apply "bottom-up" reading strategies (Kantarci, 2006), that those who are better at reading skills employ "useful" (Kayacan, 2005) and "top-down" strategies (Uzuncakmak, 2005) more often than unsuccessful ones. Likewise, studies concerning training on reading strategies are mainly designed with higher education students studying English at a preparatory program (Arpacioglu, 2007; Cicekoglu, 2003; Erarslan, 2008; Kantarci, 2006; Sayram, 1994), or at an English Language Teaching program (Aslan, 2007; Cubukcu, 2008; Muhtar, 2006). In several studies, instruction on reading strategies did not improved comprehension of the experimental group as opposed to that of the control group (Cicekoglu, 2003; Muhtar, 2006; Sayram, 1994). Based on these results, a question arises; "how can strategy instruction be provided effectively in accordance with students' needs?"

Among the strategy teaching models in language learning, the Cognitive Academic Language Learning Approach (CALLA) was originally developed in 1986 to improve not only language success of students learning English as a second language in the United States, but also their academic achievement in general through use of strategies. Subsequently, revision and renewal studies of the model were conducted at various schools (Allen, 2003, pp. 331-332; Chamot & O'Malley, 1994, p. 4; Chamot & O'Malley, 1996, p. 259).

Theoretically based on cognitive learning theory, CALLA focuses more on learning rather than teaching. It is clearly underscored that teachers can learn how to teach better by understanding how students learn (Chamot & O'Malley, 1994, p. 19). The model consists of three salient elements (Chamot & O'Malley, 1994, pp. 10-12): content topics, improving academic language skills, and teaching of language learning strategies. Depending on the level of students, content subjects can be chosen among mathematics, science, social studies, and literature. This model does not aim to teach all the topics of a specific course, but rather teaching several topics in detail (Chamot & O'Malley, 1994, p. 10). Content provides not only the opportunity to use functions of language and skills that students need in order to understand, discuss, read and write about it, but also it creates the setting necessary to teach strategies to students (Chamot & O'Malley, 1994, p. 26). These three salient elements forming CALLA build the setting needed to train students about strategies in accordance with their needs. For instance, the content of a program based on CALLA and tailored to needs of literature students may be chosen among literary texts. Since the learning task determines the strategies to be practiced in such a program, it would be easy to focus on the strategies that students would employ to understand literary texts. Therefore, a program based on CALLA makes it possible to teach language learning strategies to students in a way that appeals to their needs and interests. With such a feature, this model seems as an appropriate one especially for those students studying at higher education level and learning a language for academic purposes. However, there is still a need to test and improve the model by designing further studies across varying conditions such as native language, foreign language, field of study, and educational level.

In Turkey, two studies using CALLA for strategy instruction concluded that instruction had positive effects on English learning students' reading (Arpacioglu, 2007) and speaking (Atik, 2006) skills. These results suggest that this model may be efficacious in teaching English in Turkey. Still, the model should also be tested for efficacy with other foreign languages that have become increasingly important in secondary and higher education in Turkey. Literature review shows that there is no study on teaching reading strategies based on CALLA to higher education students studying French as a foreign language, which is the subject of the current study. Designed with the belief that effective strategy instruction can only spread across different languages and different proficiency levels through conducting research on students learning various languages, this study aims to

investigate the effects of teaching reading strategies based on CALLA over students' comprehension levels and their use of reading strategies.

In accordance with this primary aim, answers to following questions have been sought:

In a French course, as a foreign language at higher education level;

1) What is the effect of teaching reading strategies based on CALLA over students' skills to comprehend what they read in French?

2) What is the effect of teaching reading strategies based on CALLA over students' use of reading strategies?

2. Method

2.1 Research Design

The study was designed as an action research. Action research is defined as any systematic inquiry conducted by teacher researchers, principals or other stakeholders in the teaching/learning environment to get information about how they teach, how well students learn, and how their schools operate (Mills, 2003, p. 5). According to Fraenkel and Wallen (2003, p. 577), when teachers want to teach better or to solve any problem, they can conduct action research. For the present study, action research was employed in order to improve students' reading skills through teaching reading strategies based on CALLA. The steps of the Dialectic Action Research Spiral suggested by Mills (2003, p. 19) were followed: identify an area of focus, collect data, analyze and interpret data, and develop an action plan.

2.2 Participants

The participants of the study are 18 students studying French at Preparatory Program at Eskisehir Osmangazi University during the spring term of 2009-2010. With an age range between 18 and 23, 4 of the participants are males and 14 of them are females. As for the educational background of participants, all of them studied foreign language before university at different types of high schools; 8 of them graduated from general high schools, 5 from Anatolian high schools, 4 from foreign language intensive high schools, and 1 from open education high school.

2.3 Procedure

Prior to the intervention, data was collected to identify students' needs for strategy instruction. The general outline of strategy instruction was determined congruous with the literature. However, changes were made on lesson plans in order to overcome the troubles encountered during the intervention and to enhance the efficacy of the intervention because of the nature of action research.

The intervention lasted 8 weeks, four-hours a week between 16th of March and 12th of May, 2010 at the preparatory program. To ensure of validity of action research and to solve any problem encountered during the intervention, courses were video-taped and a validity committee came together once in two weeks. Validity committee consisted of three academicians from the department of French Language Teaching and the researcher conducting the instruction. Some sections of the videos that had undergone macro-transcription were viewed during validity committee meetings. Course plans for following two weeks were outlined in accordance with the decisions made during validity committee meetings.

Strategy instruction started with strategies that students often used, and moved towards those that were rarely employed by students and that were advised to be effective strategies in the literature. Table 1 depicts the strategy instruction calendar and strategies to be practiced during the instruction.

Table 1. Instruction calendar and strategies to be practiced

Procedure	Date	Strategies to be practiced
1st Week	16.03.2010	Goal setting
2nd Week	23.03.2010	Previewing, using background knowledge, predicting
First Validity Committee Meeting	29.03.2010	
3rd Week	30.03.2010	Making inferences
4th Week	06.04.2010	Selective attention

Second Validity Committee Meeting	12.04.2010	
5th Week	15.04.2010	Self-questioning, making inferences (review)
6th Week	20.04.2010	Summarizing
Third Validity Committee Meeting	03.05.2010	
7th Week	06.05.2010	Review (predicting, self-questioning, summarizing)
8th Week	12.05.2010	Review (previewing, using background knowledge, selective attention)

As seen in Table 1, first 6 weeks of the instruction were dedicated to teaching strategies such as goal setting, using background knowledge, making inferences, selective attention, self-questioning, and summarizing while the last two weeks were allocated for the application of strategies taught.

During strategy instruction, five steps of the model were followed: preparation, presentation, practice, evaluation, and expansion. During preparation, the aim is to raise students' awareness of the strategies they already use. In presentation, the name of the strategy to be taught is announced, its functionality is clarified, and its use is modeled. During practice, students are given opportunities to practice the strategy. Activities conducive to assessing strategy use form the evaluation step. Finally, students are encouraged to transfer the strategy they tried to other tasks (Chamot, Barnhardt, El-Dinary & Robbins, 1999, 43-45).

2.4 Data Collection

Data for the study was collected through Reading Comprehension Achievement Test, Reading Strategy Scale, and Think-Aloud Technique before and after the instruction. Reading Comprehension Achievement Test and Reading Strategy Scale were administered to all participants both before and after the instruction. Think-Aloud Technique was administered to six focal students both before and after the instruction.

Reading Comprehension Achievement Test used to determine the effect of reading strategies instruction based on CALLA over students' skills to comprehend what they read has been developed by researchers. Validity study of the achievement test has been completed through consulting experts from French Language Teaching. Based on the expert opinion, 6 of 18 texts from different genres were selected, and 76 questions regarding these 6 texts were written in accordance with course aims and after consulting a field expert from French Language Teaching. Furthermore, four other experts from the same field reviewed the 76 questions in terms of compatibility with course aims and outcomes. As a result of the consultation with experts, totally 65 questions were chosen; 4 short answer questions, 4 sort order questions, and 56 multiple choice items. The pilot study for the validity of the achievement test was administered to 52 Preparatory School students studying at French Language Teaching Program at Anadolu University on the 23rd of February, 2010, as two tests; one with 30 questions and the other with 35 questions. K-R 20 reliability coefficient of the test was identified to be 0.798. Following item analysis, questions with item discrimination values lower than 0.30 were eliminated, and the test was finalized to contain 33 questions with item discrimination values higher than 0.30.

Utilized in this study, Reading Strategies Scale was developed by Mokhtari and Sheorey (2002) in order to evaluate how students learning English as a second or foreign language use reading strategies. Internal consistency reliability of the scale is 0.89 (Mokhtari & Sheorey, 2002, pp. 2-4). Reading Strategies Scale was adapted into Turkish and administered to students learning English at a preparatory program of a higher education institution by Mendi (2009, pp. 46-57). Cronbach alpha coefficient was calculated to be 0.84 after the pilot study on 76 students, and the coefficient was determined to be 0.87 following the actual study on 334 students. Containing 30 items, it is a 5-point likert-type scale.

For Think-Aloud Technique, the individual is asked to verbalize what s/he thinks during learning a specific task, and his/her speech is recorded (Gass & Mackey, 2007, p. 55). Two texts were equalized based on expert opinion from French Language Teaching and a pilot study conducted with one voluntary student. Six focal students were chosen for think-aloud technique. During the selection of focal students, grades scored on Reading Comprehension Achievement Test before the instruction were taken into consideration, and two students from each success level (poor-mediocre-good) were chosen. All focal students—one male and five females—volunteered to participate in the study. Focal students were asked to state what goes on in their minds during reading one of the chosen texts both before and after the instruction by using think-aloud technique. One

of the two students in each success level read the text of "Arabian Nights" and the other read the text of "Alice in Books" before the instruction, and they swapped the texts after the instruction. Students' speech performed during think-aloud technique was audio-taped.

2.5 Data Analysis

Descriptive and inferential statistical analyses were employed for the analysis of Reading Comprehension Achievement Test. For descriptive analysis, arithmetic means and standard deviation of success scores were calculated. Inferential statistical analysis was employed to see if the difference between students' pretest and posttest scores was statistically significant. Pallant (2005) stated that non-parametric tests were useful when the sample was small (e.g., <30). Thus, Wilcoxon Signed Rank Test, which is a non-parametric test, was also used during analyses.

Similarly, Wilcoxon Signed Rank Test was utilized in order to determine if there was a statistically significant difference between the scores students got from Reading Strategies Scale before and after the instruction since the number of participants was lower than 30. Significance level was identified to be 0.05 as a result of both analyses.

On the other hand, data obtained through think-aloud technique was digitally analyzed. First step in data analysis was to transcribe audios into text form. Based on reading strategies classification derived from the distinction between cognitive and meta-cognitive strategies postulated by Chamot and El-Dinary (1999) during a study where they used think-aloud technique, themes and reading strategies within each theme were defined, and a code list for these reading strategies was devised. Sample data set was coded and necessary corrections were made before finalizing the code list. At this point, a field expert was consulted about strategy classification and definition of strategies. All the data from think-aloud technique was coded by the researchers and a field expert while a random 66% of this data was coded by another field expert independently. Codings completed by researchers and field experts were compared, and coding reliability coefficient was determined as 85% in accordance with the formula (Reliability = Agreement / Agreement + Disagreement x 100) developed by Miles and Huberman (1994, p. 64). Subsequently, some disagreements between the researchers and field experts were further clarified and the coding reliability was later identified to be 86%. Types of strategies used by students were determined based on the coding completed by the researchers.

3. Findings

3.1 Findings Regarding the Effect of Teaching Reading Strategies Based on CALLA over Students' Skills to Comprehend What They Read in French

Students' pretest and posttest scores from Reading Comprehension Achievement Test in French were calculated through descriptive statistics, and Wilcoxon Signed Rank Test was administered to see if there was any statistically significant difference between their pretest and posttest scores in order to determine the effect of reading strategies teaching based on CALLA over students' skills to comprehend what they read. Table 2 displays descriptive statistical values for students' pretest and posttest scores.

Table 2. Descriptive statistical values concerning pretest and posttest scores obtained from Reading Comprehension Achievement Test

	N	$\overline{X}$	*SS*	The lowest value	The highest value
Pretest	18	18.11	3.66	9	24
Posttest	18	23.44	2.77	19	28

As depicted in Table 2, arithmetic mean of students' pretest scores is 18.11, and standard deviation is 3.66 while the mean and deviation for posttest scores are 23.44 and 2.77, respectively. Students' mean score seems to have increased by 5 points between pretest and posttest. Moreover, standard deviation for the posttest scores is lower than that of pretest, which means that the gap among the scores obtained by students from posttest got smaller, and the class became more homogenous in terms of comprehending what they read in French. Table 3 shows findings of Wilcoxon Signed Rank Test employed to determine if there was a significant difference between the pretest and posttest scores.

Table 3. Wilcoxon signed rank test results concerning pretest and posttest scores obtained from reading comprehension achievement test

Posttest-Pretest	*N*	Rank mean	Rank total	*Z*	*P*
Negative rank	1[a]	1.50	1.50	-3.666 [d]	.000*
Positive rank	17[b]	9.97	169.50		
Equal	0[c]				

Note. * p < .05 [a] Posttest < Pretest [b] Posttest > Pretest [c] Posttest = Pretest [d] Based on positive ranks

Examination of Wilcoxon Signed Rank Test values in Table 3 indicates that 17 of 18 participants scored higher on posttest and that there was a statistically significant difference between pretest and posttest scores, significance value being 0.05. As a result of Wilcoxon Signed Rank Test administered to students' pretest and posttest scores, teaching reading strategies based on CALLA has a significant effect over students' ability to comprehend what they read in French.

3.2 Findings Regarding the Effect of Teaching Reading Strategies Based on CALLA over Students' Use of Reading Strategies

Data obtained from Reading Strategies Scale and think-aloud technique were analyzed in order to identify the effect of teaching reading strategies based on CALLA over students' use of reading strategies.

Findings regarding reading strategies scale are followed by the ones concerning think-aloud technique below.

3.2.1 Findings Regarding Reading Strategies Scale

Descriptive statistical values of students' pretest and posttest scores on the scale are shown in Table 4.

Table 4. Descriptive statistical values concerning the pretest and posttest scores obtained from Reading Strategies Scale

	N	$\overline{X}$	*SS*	The lowest value	The highest value
Pretest	18	3.68	0.52	2.43	4.57
Posttest	18	4.01	0.38	3.37	4.67

Table 4 points that the pretest arithmetic mean students scored on Reading Strategies Scale increased from 3.68 to 4.01 for the posttest. Both pretest and posttest arithmetic means students got on the scale are higher than 3.5. Therefore, it can be concluded that students' use of reading strategies is generally high. The fact that students had a foreign language intensive secondary education, that they have a lot of experience in foreign language learning, and that they were used to applying reading strategies before the instruction can account for this result. However, still an increase on the values after the instruction can be observed. Table 5 displays Wilcoxon Signed Rank Test results used to identify if there was a statistically significant difference between the scores students got for the pretest and posttest.

Table 5. Wilcoxon signed rank test results concerning pretest and posttest scores obtained from reading strategies scale

Pretest-Posttest	*N*	Rank mean	Rank total	*Z*	*P*
Negative rank	3 [a]	7.17	21.50		
Positive rank	15 [b]	9.97	149.50	-2.788 [d]	.005*
Equal	0 [c]				

Note. * p < .05 [a] Posttest < Pretest [b] Posttest > Pretest [c] Posttest = Pretest [d] Based on negative ranks

A close examination of Table 5 shows that 15 of 18 students scored higher during the posttest whereas 3 of them scored lower than pretest scores. Wilcoxon Signed Rank Test indicated that there was a statistically significant difference between pretest and posttest scores, significance value being 0.05. According to the descriptive statistical values of Reading Strategies Scale and the results of Wilcoxon Signed Rank Test, it may be concluded that students either increased their use of several strategies or their awareness concerning strategies in general expanded.

Descriptive statistical values concerning students' pretest and posttest scores for each item and Wilcoxon Signed Rank Test results completed to determine if there was a statistically significant difference between the pretest and posttest scores can be found in Table 6.

Table 6. Descriptive statistical values and Wilcoxon Signed Rank Test results concerning pretest and posttest scale scores for strategy types

Item #	Strategies	Pretest		Posttest		*Z*	*p*
		$\overline{X}$	*SS*	$\overline{X}$	*SS*		
1	Purpose setting for reading	4.22	0.65	4.56	0.51	-1.897[a]	.058
2	Taking notes while reading	3.11	1.32	2.94	1.11	-.566[b]	.571
3	Using background knowledge	4.00	1.03	4.22	0.88	-.735 [a]	.462
4	Previewing for gist	4.28	0.89	4.28	0.75	.000 [c]	1.000
5	Reading aloud when text becomes hard	2.33	1.33	2.50	1.15	-.561 [a]	.575
6	Checking how text content fits purpose	3.28	1.45	3.94	0.94	-2.145 [a]	.032*
7	Reading slowly and carefully	4.28	0.67	4.61	0.61	-1.604 [a]	.109
8	Noting text characteristics	4.44	0.92	4.78	0.43	-1.294 [a]	.196
9	Trying to stay focused on reading	4.11	1.02	4.22	0.73	-.074 [a]	.941
10	Underlining information in text	3.89	1.28	4.11	1.08	-.723 [a]	.469
11	Adjusting reading rate	2.78	1.44	3.33	1.19	-1.731 [a]	.083
12	Determining what to read	3.78	1.06	4.44	0.62	-2.360 [a]	.018*
13	Using reference materials	4.00	0.84	3.72	0.89	-1.155 [b]	.248
14	Paying close attention to reading	4.11	0.96	4.61	0.61	-2.124 [a]	.034*
15	Using text features (e.g. tables, figures)	4.11	1.08	4.67	0.49	-2.308 [a]	.021*
16	Pausing and thinking about reading	3.44	1.25	3.83	0.86	-1.461 [a]	.144
17	Using context clues (e.g. subtitles)	4.00	0.97	4.61	0.50	-3.051 [a]	.002*
18	Paraphrasing for better understanding	3.33	1.28	3.39	1.24	-.206 [a]	.837
19	Visualizing information read	3.39	1.20	3.83	1.10	-1.456 [a]	.145
20	Using typographical aids (e.g. bold and italics)	3.83	1.42	4.72	0.46	-2.395 [a]	.017*
21	Evaluating what is read	2.89	1.08	3.22	1.11	-1.231 [a]	.218
22	Going back and forth in text	3.83	1.04	4.17	0.92	-1.459 [a]	.145
23	Monitoring Comprehension	3.72	0.96	4.11	0.76	-1.732 [a]	.083
24	Predicting	4.50	0.79	4.00	0.77	-2.324 [b]	.020*
25	Re-reading for better understanding	3.89	1.18	4.22	1.06	-1.231 [a]	.218
26	Self-questioning	2.39	1.20	3.39	1.33	-2.151 [a]	.031*
27	Confirming predictions	3.00	1.19	3.61	1.04	-2.230 [a]	.026*
28	Guessing meaning of unknown words	4.33	0.69	4.44	0.70	-.649 [a]	.516
29	Translating from French into Turkish	4.06	1.06	3.89	0.96	-.636 [b]	.525
30	Thinking in both French and Turkish while reading	3.17	1.29	4.06	1.06	-2.565 [a]	.010*

Note. Considering the strategies items are meant to assess, they are written in shorthand form. Findings regard 18 students. * $p < .05$ [a] Based on negative ranks (Posttest < Pretest) [b] Based on positive ranks (Posttest > Pretest) [c] Total of positive ranks is equal to total of negative ranks (Posttest = Pretest)

Evaluation of the values in Table 6 points that students' mean scores for use of strategies such as taking notes while reading, (item 2), using reference materials (item 13), predicting (stem 24), and translating from French into Turkish (item 30) went down after the instruction. According to Wilcoxon Signed Rank Test, among these strategies only the predicting strategy has a statistically significant difference between pretest and posttest, with a significance value of 0.05. Students' mean score of using this strategy lowered from 4.50 to 4.00 after the instruction, which may mean that students had already been using this strategy frequently, and following the instruction, they either started to use other strategies more often, or they began using guessing strategy more consciously.

Table 6 also shows that the mean for 'skimming for gist' (item 4) stayed the same before and after the instruction and all other means got higher following the instruction. As for Wilcoxon Signed Rank Test, one may conclude that the instruction had a statistically significant effect over the use of following strategies, with a significance value of 0.05.

1) Checking how text content fits purpose (item 6)
2) Determining what to read (item 12)
3) Paying close attention to reading (item 14)
4) Using text features (e.g., tables, figures) (item 15)
5) Using context clues (e.g., subtitles) (item 17)
6) Using typographical aids (e.g., bold type and italics) (item 20)
7) Self-questioning (item 26)
8) Confirming predictions (item 27)
9) Thinking in both French and Turkish while reading (item 30)

Thus, it is plausible to state that use of these strategies has increased after the instruction according to results of Wilcoxon Signed Rank Test and the difference among scores before and after the instruction.

The finding that mean scores for strategies such as determining what to read, using text features, and using contextual clues got significantly higher after the instruction can be attributed to teaching how to employ selective attention during the instruction. Furthermore, the use of self-questioning strategy, which was also taught and practiced during the instruction, went up significantly. These results indicate that the instruction on selective attention and self-questioning heightened the use of these strategies among students.

The fact that the mean for "confirming predictions" rose can be tied to the instruction on use of predicting strategy during the instruction. However, there seems an increase on the use of "confirming predictions", but a decrease on predicting strategy. Examining pretest and posttest scores for these strategies shows that the difference between their scores was a lot higher before the instruction, and the instruction made their frequency of use closer. This result may indicate that students' awareness concerning these strategies improved, and that they started to use them more wisely.

In conclusion, the findings of Reading Strategy Scale display that students' use of reading strategies in general increased, and that the instruction on selective attention and self-questioning during the instruction based on CALLA had a positive influence over the use of these strategies.

3.2.2 Findings Regarding Think-Aloud Technique

Six focal students were asked to read a text in French by using think-aloud technique both before and after the instruction; and the types of strategies these students used during reading were identified after data analysis. At least one time use of a sub-strategy by a student during reading was considered as a sign of that strategy. By doing so, the number of sub-strategies used by each focal student during think-aloud technique both before and after the instruction was calculated. Table 7 depicts the total number and types of strategies employed by all focal students in accordance with the distinction between cognitive and meta-cognitive strategies, the classification also used during data analysis.

Table 7. Total number of strategy types used by students before and after strategy instruction

Strategy types	Before strategy instruction	After strategy instruction
Meta-cognitive strategies	54	62
Cognitive strategies	60	64
Total	114	126

Note. Numbers in the table refer to the total number of strategy types used by 6 focal students

As seen in Table 7, focal students used more cognitive strategies than meta-cognitive ones both before and after the instruction, and the number of strategies they applied augmented for both types after the instruction. On the other hand, Table 8 points that the time students used for think-aloud technique lessened after the instruction.

Table 8. The texts and duration of audio-tapes recorded during think-aloud technique before and after strategy instruction

Focal Student	Before strategy instruction		After strategy instruction	
	Texts	Duration (min.)	Texts	Duration (min)
FS1	Alice in Books	72.56	Arabian Nights	46.05
FS2	Arabian Nights	60.44	Alice in Books	34.26
FS3	Alice in Books	27.40	Arabian Nights	21.11
FS4	Arabian Nights	14.44	Alice in Books	27.12
FS5	Alice in Books	38.21	Arabian Nights	41.36
FS6	Arabian Nights	48.05	Alice in Books	24.38
Total		262.50		130.13

Note. FS: Focal student

Integrating the finding that total time students allocated to reading diminished and the number of strategy types they employed increased at the end of the instruction, one can conclude that students started using more types of strategies, especially meta-cognitive ones.

Table 9 indicates how many students utilized which meta-cognitive strategies before and after strategy instruction.

Table 9. Types of meta-cognitive strategies used by students before and after strategy instruction

Meta-cognitive strategies	Before strategy instruction	After strategy instruction
Previewing	6	8
Previewing the organization of the text	3	4
Previewing for gist	3	4
Self-Monitoring	26	28
Monitoring comprehension	6	6
Monitoring strategy use	6	6
Monitoring pronunciation	2	2
Verifying/Reshaping	5	6
Self-questioning	4	5
Self-assessment	3	3
Selective attention	23	26
Noticing the visuals	2	4
Noticing the title	4	6

Noticing the grammar	6	4
Noticing the familiar vocabulary	2	2
Noticing the unknown vocabulary	6	6
Noticing the key words	0	2
Noticing pronunciation	3	2
Direct attention	0	1
Total	54	62

Note. Findings regard the meta-cognitive strategies employed by 6 focal students. The numbers concerning skimming, self-monitoring, and selective attention point to the total number of focal students utilizing the sub-types of these strategies.

As Table 9 displays, previewing, self-monitoring, selective attention, and direct attention were used by more students after the instruction than before. Taking the findings on sub-types of self-monitoring strategy into consideration, one can see that more than half of students employed verifying and self-questioning strategies during both before and after the instruction and that there is a slight increase in the number of students who utilized these strategies after the instruction. These results support the findings on 'confirming predictions' and 'self-questioning' strategies obtained from Reading Strategies Scale.

After the instruction, the number of students who applied the sub-types of selective attention increased for some strategies and decreased for some others. Especially the increase in noticing the visuals, title, and keywords is worth noting. Following the instruction, more students utilized the clues provided by the visuals, title, and keywords which bear a crucial role in comprehending what is read; besides, they also varied the strategies they used after the instruction. This result supports also the ones on selective attention obtained from Reading Strategies Scale. In short, the number of students applying strategies of previewing, noticing the visuals, title and keywords, verifying/reshaping, and self-questioning augmented; and teaching how to use these strategies during the instruction had a positive effect over students' use of strategies.

Findings regarding the sub-types of cognitive strategies employed by students can be seen in Table 10.

Table 10. Types of cognitive strategies used by students before and after strategy instruction

Cognitive Strategies	Before strategy instruction	After strategy instruction
Making inferences	11	9
Inference of the meaning of words	6	5
Inference of the implicit knowledge	5	4
Elaborating	7	12
Relating background knowledge to the text	5	6
Relating the parts of the text with one another	2	6
Predicting	6	5
Transferring	5	6
Deducing	4	3
Rereading	5	6
Underlining	6	5
Taking notes	5	3
Summarizing	6	6
Translation	6	6
Using dictionary	5	5
Total	60	64

Note. Findings regard the cognitive strategies employed by 6 focal students. The numbers of making inferences and elaboration strategies point to the total number of focal students who utilize the sub-types of these strategies.

The values in Table 10 show that the number of students who used making inferences, predicting, deducing, taking notes, and underlining decreased whereas that of students who applied elaborating, transferring, and re-reading went up after the instruction.

Although almost all the students employed making inferences and predicting during both before and after the instruction, a slight drop in the number of students employing these strategies after the instruction is noteworthy. This unexpected finding may be attributed to the possibility that students may have needed using these strategies less since they encountered fewer problems after the instruction reading due to being trained on strategy use. The fact that many students spent considerably less time during reading after the instruction (see Table 8) also supports the interpretation that students started reading more fluently and faster, and that they had fewer difficulties while reading after the instruction. The number of students who applied strategies to tackle with linguistic units such as deducing, taking notes—in the form of writing the meaning of unknown vocabulary—, and underlining—which helps noticing the unknown vocabulary—decreased following the instruction. Instead, students preferred using elaborating strategies such as re-reading, relating background knowledge to the text, and relating parts of the text with one another. Especially the number of students who applied 'relating parts of the text with one another' rose significantly. Although there was no explicit instruction on the use of this strategy, this increase may be attributed to the positive effect of the instruction on strategies that help focus on the text as a whole such as previewing and summarizing, and to the possibility that students adopted a holistic approach towards the text as a result of their enhanced reading comprehension after the instruction.

Based on the findings regarding use of cognitive strategies by students, it is possible to conclude that students began using cognitive strategies that help comprehending the text as a whole such as relating background knowledge to the text and relating parts of the text with one another after the instruction. Research findings show that the use of strategies such as deducing, note taking, and underlying which are directed to clarifying linguistic problems decreased after the instruction.

All in all, results concerning think-aloud technique yield that students varied the cognitive and meta-cognitive strategies they employed after the instruction and that the number of students who applied strategies such as noticing the grammar, deducing, and underlining, which are directed to solving vocabulary and linguistic issues, lessened whereas the number of students who used strategies to focus on the text as a whole such as previewing; noticing the visuals, title, and keywords; relating background knowledge to the text; and relating parts of the text with one another increased after the instruction. This is an indicator that the instruction on previewing, selective attention, self-questioning, and using background knowledge had a positive influence over the use of these strategies. In conclusion, it may be stated that teaching reading strategies based on CALLA helped students vary the strategies they employed.

4. Discussion and Suggestions

A statistically significant difference between the pretest and posttest scores obtained from Reading Comprehension Achievement Test has been identified in this research. Under the light of this finding, it wouldn't be suggested that teaching reading strategies based on CALLA had a positive effect on higher education students' skill to comprehend what they read in French. This result is consistent with those of many other studies that investigated the effect of strategy instruction based on CALLA over students' comprehension skills in reading in a second or foreign language (Arpacioglu, 2007; Cubukcu, 2008; Handyside, 2007; Karbalaei, 2011; Takallou, 2011). All the aforementioned research was conducted on students learning English as a second or foreign language at higher education level, except for Handyside (2007). Therefore, stating that teaching reading comprehension strategies based on CALLA is an effective way to enhance especially higher education students' reading comprehension skills in a second or foreign language won't be wrong based on the studies conducted so far.

The results indicating a change in students' use of reading strategies imply that teaching reading strategies based on CALLA had a positive effect over students' use of reading strategies. A statistically significant difference between pretest and posttest scores obtained from Reading Strategies Scale points to the fact that students had positive gains from the instruction. Moreover, among the strategies taught during the instruction, "selective attention", "self-questioning", and "confirming predictions" were used more frequently after the instruction than before.

Data obtained from think-aloud technique shows that the type of both cognitive and meta-cognitive strategies used by students increased and that students began alternating the strategies they applied. Results concerning the strategies reveal that more students started to utilize previewing, noticing the visuals and title, self-questioning, relating background knowledge to the text, and relating parts of the text with one another after the instruction.

These strategies require students be active during reading and interpret the text by using background knowledge. Instruction provided on previewing, selective attention, self-questioning, and use of background knowledge during the instruction both increased the number of students who apply these strategies and improved students' reading comprehension skills. Oxford, Cho, Leung and Kim (2004) and Uzuncakmak (2005) determined that successful students mostly preferred using "top-down" strategies that necessitate use of background knowledge and that help direct the focus on the text as a whole. Thus, teaching how to apply these strategies may help cure the problems of students with poor comprehension skills.

All these findings collected through various tools signify that CALLA may be administered as an effective instrument in teaching reading strategies for French as a foreign language. However, it would be wise to view the results of this research under the light of the fact that it has been conducted with a small group of students and without a control group, which is a limitation of the study. Researchers didn't have the intention to draw generalizations based on the results of this study; rather they aimed to picture the effects of the instruction through use of various data collection tools in a study with an action research design. Yet, it is reasonable to suggest that teaching reading strategies based on CALLA has a positive effect since the data obtained through various tools is consistent.

Determining if teaching reading strategies was effective over students' use of strategies in general based on the types of strategies they employed may be given as another limitation to the current study. During strategy instruction, the aim was to make students utilize several strategies and to raise their awareness regarding the strategies that they hadn't used prior to the instruction; thus, data collection tools helped to identify how these aims were met. Therefore, the strategies employed by students were established through several data collection instruments. That is why a systematic data collection regarding how skillful students were in using different strategies was not possible.

In accordance with the findings of this study, providing strategy instruction based on CALLA for poor readers having troubles about comprehending what they read in French may be suggested. Strategy instruction based on this model may be fruitful for especially students who study French Language Teaching, French Language and Literature, Comparative Literature and who have poor comprehension skills. It may be insightful to accompany the strategies that students frequently apply with those meta-cognitive reading strategies, which are highly influential over comprehension skills, and the ones that make students active during reading such as selective attention, self-questioning, use of background knowledge, and summarizing in the strategy instruction program. Furthermore, it is worth stating that there is a need for studies to determine how skillfully students employ various strategies, the strategies that they have troubles in applying, and to design instruction programs that would improve the use of strategies that students have problems with.

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Note

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