

A Proposed Metacognition-Based CALL Program to Improve EFL Students' Reading Comprehension Skills and Motivation

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Abstract

The purpose of the current study was to improve EFL secondary school students' reading comprehension skills and motivation using a proposed metacognition-based CALL program. The study was implemented on 15 EFL secondary school students. A pre-post reading comprehension skills test was designed and used as an instrument in this study to assess students' reading comprehension skills before and after the experimental treatment. In addition, a motivation for reading scale was also used as an instrument to assess students' motivation to read. The study concluded that the study group outperformed the control group in both the reading comprehension skills test and the motivation for reading scale. Therefore, the proposed metacognition-based CALL program proved to be effective to improve EFL secondary school students' reading comprehension skills and motivation. This was deduced through the effect size of the treatment on students' reading comprehension skills and motivation. As a result, the need for more researches to improve reading comprehension skills and motivation using some proposed metacognition-based CALL programs is required.

Key words: Reading comprehension skills, Metacognition, Computer-Assisted Language Learning (CALL), EFL secondary school students

Introduction

Reading is an important skill for EFL learners to master. To be a good reader, the EFL learner should achieve success not only in English but also in other contents where English reading proficiency is required. Reading plays a vital role in the

development of language skills. Reading is an important means to expand knowledge and experience. Learners can read different materials to get the necessary information they need. Motivating students to read helps them to comprehend reading texts.

In order to read and be engaged in the reading text, students need to be motivated. Motivation has its necessary role in the teaching / learning process. Student motivation is a key factor in successful reading. In order to effectively support reading comprehension in the classroom, it is helpful to consider the element of motivation. If a student's reading motivation is high, the amount and breadth of reading increases (Weigfield and Guthrie, 1997). Accordingly, if the amount and breadth of reading increases, a student will achieve more academically (Anderson, Wilson and Fielding, 1988).

In EFL situations, learners' motivation to read might have a crucial influence on their reading achievement (Nishino, 2005). As reading motivation and reading comprehension are related to each other, the researcher will design a metacognition-based computer-assisted language learning (CALL) program to improve students' reading skill and reading motivation.

Metacognition has its vital role in the learning process. Metacognition concentrates on what one knows and does not know. It builds the independent thinkers. In addition, it enables students to self-direct their own learning. It affects learning process positively so, it is combined with CALL to improve reading comprehension skills and motivation.

Technology is the language of the age. Computers have become widespread everywhere at homes and schools due to their numerous uses and implications. Computer can serve a variety of uses for language teaching. It can be a tutor which offers language drills or skill practice, a stimulus for discussion and interaction or a tool for writing and research. With the help of the internet, it can be a medium of global communication and a source of limitless authentic materials.

In view of the implication of using computers to enhance students' reading comprehension skills and motivation, the researcher tries to consolidate this relation based on metacognition.

Review of literature

Reading comprehension

The goal of reading for students is to understand or comprehend the material of the text because reading comprehension is a bridge to understand the written text. A good reader is the one who is able to understand the text not only who turns the written text to oral codes. Understanding the written word is an essential aim of academic skills. The goal of different reading programs is still to improve reading comprehension of students attempting to enhance their achievement because comprehending the reading text is needed for students to succeed (Knoll, 2000).

Comprehension is an active and purposeful process that leads to understanding and remembering what was read. It requires a reader to interact with the text; using experiences and knowledge of the world, knowledge of vocabulary and language structure, and knowledge of comprehension strategies to make sense of what is being read; recognizing problems when they occur during reading and how to resolve them. In addition, it is purposeful because the essence of reading is to construct meaning. One reads to learn, to locate information, for entertainment and for pleasure (Vallely, n.d.).

Comprehension occurs as the reader builds a mental representation of a text message (Kintsch and Rawson, 2005). The comprehension process that brings about this representation occurs at multiple levels across units of language: word level (lexical processes), sentence level (syntactic processes) and text level (Perfetti, Landi and Oakhill, 2005). These levels of word identification processes and a variety of inference processes all contribute interacting with the reader's conceptual knowledge to produce a mental model of the text. The

atoms of meaning are extracted from sentence aggregated through the reading of other sentences of the text and supplemented by inferences necessary to make text coherent (Perfetti, Landi and Oakhill, 2005).

Reading comprehension is the process of constructing meaning from text. The target goal is to comprehend the text and reading comprehension involves at least two people: the reader and the writer. The reader decodes the writer's words, uses background knowledge then constructs a near understanding of the writer's message. Reading Comprehension can be given in the form of stories, case lets, cases, descriptions and narrations. The learners can be encouraged by allowing them to follow the different methods of reading such as, skimming and scanning.

Reading comprehension is a multi-component skill whereby the reader has to use a number of different cognitive processes involving word recognition, access of word meaning, phrasing of sentences, semantic analysis of sentences, and interpretation of the overall text (Tan and Nicholson, 1997). Reading comprehension is not only a decoding of block marks upon a page but it is a quest for meaning and one which requests the reader to be active participant also. On the other hand, Weedman (2004) asserted that reading comprehension is thinking and considering meaning before, during and after reading by integrating information from the author with the reader background knowledge. The reader must monitor his/her comprehension to determine if the comprehension needs repairs or not.

Motivation

Motivation has its necessary role in the teaching-learning process. Student's motivation is a key factor in the successful reading. Educational psychologists have long recognized the importance of motivation for supporting student learning. More recently, the Partnership for 21st Century Skills has identified initiative as one of the life and career skills necessary to prepare students for post-secondary education and the workforce (Lai, 2011). In order to effectively support reading comprehension in

the classroom, it is helpful to consider the element of motivation. Perfetti, Landi and Oakhill (2005) thought that the complex interaction among the comprehension components and the role of motivation for reading make gains difficult to achieve. Motivation is a pivotal aspect of reading engagement because of its effortful activity that involves choice (Wigfield, Guthrie, Tonks and Perencevich, 2004). The most outstanding sets of constructs in the motivation area are self-efficacy, beliefs, intrinsic and extrinsic motivation and goals for learning and social aspects of motivation (Middleton, 2011).

Motivation refers to "the reasons underlying behavior" (Guay et al., 2010). Motivation is broadly defined as "the attribute that moves us to do or not to do something" (Broussard and Garrison, 2004). In reading literature, much of the work relevant to readers' motivation has been framed in terms of attitudes toward reading. The motivational consequences of reading attitudes are that children with more positive attitudes are more motivated to read. Motivation is claimed to be one of the most telling factors in achieving success in a second or foreign language and it is an important variable that determines self-directed learners' intentional use of language learning strategies (Hyte, 2002). The teacher should know about the theory of motivation in order to be able to deal with different attitudes of students. Achieving the basic goal of reading is connected to the student's motivation to read.

The motivational theory

Motivation is a basic factor for achieving the target goals and as a result succeeding in the task. Motivation is derived from the Latin word 'MOVERE' which means "to move" the processes that account for an individual's intensity, direction, and persistence of effort towards attaining a goal (Monica, 2013). This means that motivation refers to the reason or reasons for engaging in a specific behavior - especially human behavior. These reasons may be a drive, a need or a desire to achieve a specific goal or a state of being. In human beings, motivation involves both conscious and subconscious drives. When the

subconscious mind does a thing for one without his/her conscious awareness it is called repression. On the other hand, when one purposefully and consciously pushes a thing out of his/her awareness it is called suppression.

A motivational theory is the study of why people think about a typical achievement behavior, such as studying for an examination, and to view it as a temporal sequence that is started, sustained, directed and finally terminated (Gruham and Weiner, 1996). Motivational theories focus on the processes that explain goal-directed activity (Jacobson, 2009). Student motivation is the result of interactions among complex factors including at-home, and family circumstances and resources, school-based resources, and opportunities, interactions with teachers and administrators, interactions with peers, school-related learning and developmental experiences, and the beliefs and perceptions that these interactions and experiences give rise to (Pintrich, 2003).

Metacognition

Researchers are interested in the cognitive growth for their students and provided them different programs to benefit from their energies to lead the various fields of life. Schools also make efforts to educate the students to think correctly. Metacognition is "cognition about cognition". Firstly, what is cognition? Cognition is a Latin term, cognoscere, meaning "to know". It covers the process of thought and involves various modes of knowing, such as perceiving, remembering, imagining, conceiving and judging. Metacognition refers to cognitive processes that are involved in appraisal, monitoring or control of cognition (Flavell, 1979). The distinction between metacognition and cognition has been applied to understand the mind as a dynamic self-regulatory executive functional system and to inform the role of cognition in psychological disorders (Wells and Matthews, 1994).

Metacognition refers to "thinking about thinking" or our ability to know what we know, what we do not know and how to regulate (Costa and Kalliek, 2003). The strategic learning

through metacognition refers to learners' understanding of their own thinking and learning process. Through "thinking about thinking", students can figure out how they learn best and develop strategies to maximize their learning (Recesso and Orill, 2008). To achieve this goal, metacognitive strategies should be used. These metacognitive strategies oversee, regulate or direct the language learning process. The metacognitive strategies include planning, monitoring and evaluating.

Teachers work to guide students to become more strategic thinkers by helping them understand the way they are processing information. Questioning, visualizing, and synthesizing information are all ways that readers can examine their thinking process. Students can approach new learning, with their feeling empowered and not overwhelmed, armed with a toolbox of strategies that help them tackle new learning and easily make connections to what they already know. Because these strategies do not come naturally to a lot of students, teachers must explicitly teach them, as (Carlson, 2008) supposed. Successful students use metacognitive strategies throughout a task and actually start thinking before they start the task itself.

Computer-Assisted Language Learning (CALL)

Liou (2000) suggested that an effective method to accomplish the metacognition objectives is to use computer-assisted language learning (CALL) software. The nature of individualized student-to-computer interaction promotes self-directed learning as learners are provided an opportunity to develop planning, self-monitoring and evaluation skills (Hyte, 2002). Aside from this, CALL provides an effective learning environment that increases learners' motivation to use strategies. As well, CALL provides an effective method of evaluating metacognitive strategies to provide further insights into the effectiveness of using such strategies (Liou, 2000).

CALL is the way of applying different programs of the computer in the learning process aiming at achieving improvement in one or more skill. CALL is a relatively new and rapidly evolving academic field that explores the role of

information and communication technologies in language learning and teaching. It includes a wide range of activities and initiatives in materials development, pedagogical practice, and research. Computer-Assisted Language Learning (CALL) is a technique for using technology in the field of language learning (Januszewski and Molenda, 2013). CALL is a program derived from CAL (Computer-Assisted Learning) which is implemented to language, but the use of computer here is mainly aimed at providing a language learning tutorial program (Hartoyo, 2006). Beatty (2013) defined CALL as any process in which a learner uses a computer and, as a result, improves his or her language. As Chambers and Davies (2001) stated, CALL includes highly interactive and communicative support for listening, speaking, reading, and writing, including extensive use of the Internet.

Computer-assisted language learning refers to using computers in language learning in different ways. Therefore, there are some reasons to apply CALL in the classroom. CALL can input massive higher qualitative information and the students can decide the rate of learning by themselves. Besides, CALL can suit the instruction to students' level (Guan, 2013). For some students, computers simply provide chances to assess information in easier ways, as with text read by a computer voice generator or enlarged screen fonts, computers can become a primary means for communication (Recesso and Orill, 2008). While using computers, classrooms are not limited as before to the text in a book or confines a particular school (Recesso and Orill, 2008).

Background of the Problem

Reading comprehension skills are very vital to EFL language learners for good understanding and the motivation for reading is a key factor in successful reading. Most of language schools' students are weak in these skills in addition to their poor motivation for reading. In EFL situations, learners' motivation to read might have a crucial influence on their reading achievement (Nishino, 2005). Thus, the students' achievement in reading skills has to be improved and their

motivation to read has to be increased. Reading in language education can be improved by using computers in secondary schools (Bax, 2011).

As reading motivation and reading comprehension are related to each other, metacognition and computer-assisted language learning (CALL) will be combined together to improve students' reading skill and reading motivation.

The use of technology is supposed to be effective to improve reading motivation as the study of Tercanlioglu (2001). For example, Sitthiprom (2012), Ali (2005), Sadeghi and Soltanian (2010) and Fardy, et al. (2011) tested the effect of using CALL to improve reading skills and their results clear that CALL helps to improve students' achievement.

Statement of the Problem

Based on literature review and the results of the pilot study, it becomes clear that secondary stage students are not doing very well in reading comprehension skills, and they also need to be motivated to read. One viable approach is using a proposed metacognition-based CALL program for improving secondary school students' reading comprehension skills and motivation.

Purposes

The present study aims at:

1. Identifying the components of a metacognition-based CALL program to enhance reading comprehension skills and motivation.
2. Determining the effectiveness of a metacognition-based CALL program on developing secondary school students' reading comprehension skills and motivation.

Questions:

The research questions are stated as follows:

1. What are the components of a proposed metacognition-based CALL program to enhance reading comprehension

- skills and reading motivation of secondary school students?
2. What is the effectiveness of a metacognition-based CALL program on developing the reading comprehension skills of the students?
 3. What is the effectiveness of a metacognition-based CALL program on developing the reading motivation of the students?

Hypotheses

Using a metacognition-based CALL program would improve secondary school students' reading comprehension skills and motivation. To approve the probability of data analysis, the following four hypotheses are posed:

1. There is a statistically significant difference between the mean score of the reading comprehension posttest of the experimental group students and those of the control group in favor of the experimental group.
2. There is a statistically significant difference between the mean score of the experimental group pre-post reading comprehension test in favor of the post test results.
3. There is a statistically significant difference between the mean score of the post-administration of motivation for reading scale of the experimental group students and those of the control group in favor of the experimental group.
4. There is a statistically significant difference between the mean score of the experimental group pre-post administration of motivation for reading scale in favor of the post test results.

Significance

The current study is significant according to some ways:

Firstly, it fills in the gap between metacognition, CALL, reading comprehension skills and motivation of the first-year secondary school students in which research conducted on

explaining the effect of using CALL programs based on different strategies to develop reading skills is new.

Secondly, it is fruitful to enlarge the area of research of using different CALL programs of the first-year secondary school students.

Finally, it enhances the use of CALL and metacognition in EFL teaching process as a possible way of developing the reading skills and poor motivation which EFL learners face.

Definition of Terms

Reading Comprehension:

Reading comprehension is defined in this study as the students' ability to change the printed text to meaning. Reading comprehension skills include reading for predictions, reading for details, reading for gist, reading for specific information and reading for inferences.

Motivation:

Motivation is defined in this study as the desire to achieve a goal, task or do something whether this desire is inside or outside the person.

Participants

Participants of the study were thirty students from first year secondary stage students at Esh-shenawy secondary school for girls in Tanah enrolled in the 2nd term of the school year (2016/2017). This grade was chosen to conduct the study instruments as the students can understand the concept of metacognition, its strategies and are able to apply them. Participants were divided into two groups: the control group (n=15) and experimental group (n=15).

Design

A quasi-experimental design was used to conduct the study. The control group was taught through the regular classroom sessions and the experimental group was taught by

implementing the proposed metacognition-based CALL program. Both groups were taught a number of reading comprehension lessons. The design included some variables: an independent variable which was the proposed CALL program and the dependent variables which were reading comprehension and students' motivation.

Instruments

To achieve the purposes of the study, two instruments were developed and implemented:

1. A pre-post reading comprehension test (RCT) to assess the students' level in reading comprehension before and after the treatment.
2. A motivation for reading scale (MRS) to assess the student's motivation for reading before and after the treatment.

Results

Verifying the research hypotheses:

Results of the study are reported in terms of the study's hypotheses.

Testing the first hypothesis:

The first hypothesis stated that, "*There is a statistically significant difference between the mean score of the reading comprehension posttest of the experimental group students and those of the control group in favor of the experimental group*".

To investigate this hypothesis, the mean score of the experimental and control group students in the posttest of RCT were compared. Table (1) displays the mean scores of posttests of control and experimental groups. Results show a big difference between control and experimental groups on the total

test mean score and, on every individual skill in favor of the experimental group.

Table (1): Comparison of the reading performance of the experimental and control groups on the reading comprehension posttest.

Reading comprehension skills	Group	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Gist	experimental group	5.733	.456	4.799	6.668
	control group	4.567	.456	3.632	5.501
Prediction	experimental group	4.833	.401	4.013	5.654
	control group	3.400	.401	2.579	4.221
Specific information	experimental group	5.867	.389	5.070	6.663
	control group	4.133	.389	3.337	4.930
Details	experimental group	6.467	.313	5.826	7.108
	control group	4.800	.313	4.159	5.441
Inference	experimental group	3.900	.187	3.517	4.283
	control group	2.900	.187	2.517	3.283
Total	experimental group	26.800	.687	25.392	28.208
	control group	19.800	.687	18.392	21.208

From the previous results, it became clear that the proposed metacognition-based CALL program has a role in improving reading comprehension skills and the first hypothesis of the study is proved.

Testing the second hypothesis:

The second hypothesis stated that, "There is a statistically significant difference between the mean score of the experimental group pre-post reading comprehension test in favor of the post- test results".

For testing the second hypothesis, some descriptive statistics were made for representing the status of the experimental group pre and post- test table (2). This table compares the mean score of pre and posttest of the experimental

group. The results reveal that there is an improvement in the students' achievement in the reading comprehension test in favor of the experimental group.

Table (2): Pre and posttest means for the experimental group

Reading comprehension skills		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
Gist	pre-test	15	3.9	1.5	.40961	3.0881	4.8452
	post-test	15	5.7	1.3	.34110	5.0017	6.4649
Prediction	pre-test	15	3.7	2.1	.55162	2.5169	4.8831
	post-test	15	4.8	1.6	.43278	3.9051	5.7616
Specific information	pre-test	15	3.06	1.6	.43058	2.1432	3.9902
	post-test	15	5.8	1.1	.30654	5.2092	6.5241
Details	pre-test	15	5.3	1.5	.41019	4.4536	6.2131
	post-test	15	6.4	.97	.25103	5.9283	7.0051
Reading for Inference	pre-test	15	2.4	.83	.21529	2.0049	2.9284
	post-test	15	3.9	.57	.14800	3.5826	4.2174
Total	pre-test	15	18.5	3.9	1.01473	16.3569	20.7097
	post-test	15	26.8	2.3	.60317	25.5063	28.0937

The Analysis of Variance (ANOVA) test was performed to explore the effect of implementing the proposed program on the experimental group and detecting its effect size (Eta Squared). Table (2) reports a significant difference between pre and posttest of the experimental group achievement in the reading comprehension test. It can be observed that the difference and the effect of the proposed program is high for the total test score; reading for specific information skill, and reading for inference skill. On the other hand, it is moderate for reading for gist skill and reading for details skills. No improvement was evident on prediction skill after the implementation of the program. Students' ability to predict was at good range before the applying

the program so, the program had no effect on students' performance in the prediction skill. Therefore, there was no evidence to improve this skill.

Table (3): The Effect Size of the proposed program on the experimental group reading performance.

Reading comprehension skills		Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Gist	Between pre and post-tests	23.408	1s	23.408	10.985	.003	.282
Prediction	Between pre and post-tests	9.633	1	9.633	2.613	.117	.085
Specific information	Between pre and post-tests	58.800	1	58.800	28.064	.000	.501
Details	Between pre and post-tests	9.633	1	9.633	5.554	.026	.166
Inference	Between pre and post-tests	15.408	1	15.408	30.100	.000	.501
Total	Between pre and post-tests	512.533	1	512.533	49.041	.000	.750

The F tests the effect of test. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

The previous table shows that the proposed program affected reading comprehension as a whole. The highest partial Eta Squared are for (reading for specific information and reading for inference skills). The skills (reading for gist and reading for details skills) have reasonable scores. Although there is an improvement in reading comprehension skills, the (reading for prediction skill) has no improvement. Finally, it can be observed that the proposed program helped to improve reading comprehension skills totally. The following figure is about the effect size (Eta squared) of the proposed program on the experimental group.

Table (4) indicates high effect of the proposed program on the experimental group as the total effect size =.988. To sum up, it is obvious that the proposed program had an effect on students' reading comprehension skills.

Table (4): Tests of Between-Subjects Effects size

Reading comprehension skills	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Gist	805.883	2	402.942	129.138	.000	.902
Prediction	523.817	2	261.908	108.751	.000	.886
Specific information	772.533	2	386.267	170.412	.000	.924
Details	972.867	2	486.433	331.122	.000	.959
Inference	354.300	2	177.150	337.429	.000	.960
Total	16654.200	2	8327.100	1175.788	.000	.988

In the light of the previous results about the program's effect, the second hypothesis is verified.

The study results are consistent with Habibian (2015), Razi and Çubukçu (2014) and Ahmadi et. al, (2013) in which these studies supported the impact of training metacognitive strategies in reading comprehension. Likely, Bentahar's (2012), Sitthiprom's study (2012), Takallou's (2011) and Sen (2009) studies contributed to the improvement of students' reading comprehension performance.

In the area of Computer-Assisted Language Learning (CALL), researchers examined the impact of technology integration on the teaching and learning of English as a second language (ESL) and/or English as a foreign language (EFL) (Al-Mekhlafi, 2006). Many studies have been conducted to investigate the effect of CALL on learning languages. Many of these studies demonstrated a positive effect of CALL on students' learning and competency. In other words, CALL has gained concerns of researchers and writers (Ifeoma, 2010).

While using CALL to improve reading comprehension, results of Ahangari and Sioofy (2014), Bhatti (2013), Saeidi and Yusefi (2013) and Marzban (2011) studies go with the results of the current study. These studies prove the essential role of CALL to improve reading comprehension. Similar to the above-mentioned studies, Whitaker (2009) and Ali (2005) results supported the effectiveness of using CALL to improve reading skill.

Based on the previous studies, it became clear that using both CALL and metacognition to teach language in general and reading comprehension especially is beneficial and fruitful. Furthermore, the results of the current study are consistent with the results of most of the analyzed studies. From the above results, it would be helpful to merge CALL with metacognition to teach reading comprehension. The improvement of reading skills may be a result of the metacognition-based CALL program application. Thus, integrating metacognition and CALL in EFL reading instruction could lead to improving students' reading skills.

Testing the third hypothesis

The third hypothesis stated: " There is a statistically significant difference between the mean score of the post-administration of motivation for reading scale of the experimental group students and those of the control group in favor of the experimental group". To test this hypothesis, some descriptive statistics were calculated.

Post administration of motivation for reading scale

Examining the effect of the proposed program on the students' motivation for reading between the control and the experimental group for post administration of motivation for reading scale.

The results of Table (5) show that the total mean score of the experimental group for post-administration of motivation for reading scale is higher than that of the control group. Table (5) shows the score of the mean of the total motivation for reading scale, self-concept, and value of reading. are higher in the experimental group.

Table (5): Reading Motivation level of the experimental and the control groups on the post administration of the MRS

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
Post Self-concept	experimental group	15	30.40	2.165	.559	29.20	31.60
	control group	15	19.47	2.167	.559	18.27	20.67
Post value of reading	experimental group	15	32.27	2.463	.636	30.90	33.63
	control group	15	19.67	2.410	.622	18.33	21.00
post total	experimental group	15	62.67	4.152	1.072	60.37	64.97
	control group	15	39.13	3.962	1.023	36.94	41.33

The ANOVA test was performed to test the third hypothesis. The test results show the significantly higher scores of the posttest for the experimental group in the total score of the motivation scale: self-concept dimension, and value of reading dimension. Table (6) reports the results that lead to the verification of the third hypothesis.

Table (6): Comparison between the control and the experimental groups on post administration of motivation for reading scale.

Reading motivation scale		Sum of Squares	Df	Mean Square	F	Sig.
Post SC	Between Groups	896.533	1	896.533	191.139	.000
	Within Groups	131.333	28	4.690		
Post V	Between Groups	1190.700	1	1190.700	200.519	.000
	Within Groups	166.267	28	5.938		
Post total	Between Groups	4153.633	1	4153.633	252.245	.000
	Within Groups	461.067	28	16.467		

Testing the fourth hypothesis:

The fourth hypothesis stated: "*There is a statistically significant difference between the mean score of the experimental group pre-post administration of motivation for reading scale t in favor of the post-test results*". To test this hypothesis, some descriptive statistics were calculated.

The results in Table (7) show that the total mean score of the motivation scale for the experimental group is higher than the mean of the pre-administration.

Table (7): Comparison of the Reading Motivation for the experimental group on the pre and post scale administration

	Group	Test	Mean	Std. Deviation	N
self-concept	experimental group	Pretest	28.67	4.065	15
		Posttest	30.40	2.165	15
Value	experimental group	Pretest	27.60	3.481	15
		Posttest	32.27	2.463	15
Total motivation	experimental group	Pretest	56.27	6.006	15
		Posttest	62.67	4.152	15

For exploring the size effect of the CALL program, the Partial Eta Squared for the scale and its two dimensions (self-concept and value of reading) was estimated. All of values of size effect indicate strong influence of the proposed program for increasing students' motivation for reading Table (8).

Table (8): The size effect of the proposed program

Dependent Variable		Sum of Squares	Df	Mean Square	F	Sig.	Eta Squared
Post SC	Contrast	896.533	1	896.533	191.139	.000	.872
	Error	131.333	28	4.690			
Post V	Contrast	1190.700	1	1190.700	200.519	.000	.877
	Error	166.267	28	5.938			
Post total	Contrast	4153.633	1	4153.633	252.245	.000	.900
	Error	461.067	28	16.467			

The F tests the effect of group. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

In the light of the previous results, the fourth hypothesis is proved.

The role of motivation in reading comprehension is illustrated in a number of studies that are in line with the present study such as Lin, Wong and Chang, 2011, and Rehman et al. (2014) as these studies proved the role of motivation in learning English language and improving reading comprehension. Referring to the use of CALL, Rahnavard and Mashhadi Heidar, (2017) study investigated the effect of CALL/Web-based and conventional instructions on improving EFL learners' autonomy and motivation.

Conclusion

The present study findings were as the following:

The proposed metacognition-based CALL program improved first year secondary school students' reading comprehension skills and motivation. This was supported in the following results:

1. The experimental group students' means were better than of those of the control group in the reading comprehension test (RCT). This was clear through the significant differences between the means of the two groups.
2. The means of the experimental group students in the post-application of the reading comprehension test (RCT) was much better than theirs in the pre-application of the test.
3. The experimental group students' means were better than of those of the control group in the motivation for reading scale (MRS). This was cleared through the significant differences between the means of the two groups.
4. The means of the experimental group students in the post-administration of the motivation for reading scale (MRS) was much better than theirs in the pre-administration of the motivation for reading scale (MRS).
5. The proposed metacognition-based CALL program was effective in developing the EFL reading comprehension skills and motivation for reading of first year secondary

school students. This was deduced through the effect size of the treatment on students' reading comprehension skills and motivation.

Based on the findings and interpretation of the study, there was a significant difference in the students' reading comprehension by using the proposed metacognition based-CALL program than those who were taught by using the ordinary method. These strategies raised the students' reading comprehension understanding as well as their motivation to read. They also enabled them to be independent thinkers and understand reading text easily and be more motivated. The students got a higher score after they were taught by the proposed program.

The teacher should encourage computer-based learning and apply metacognitive strategies in order to be able to be self-regulators, independent thinkers, self-correctors and self-evaluators. The use of computers integrated with metacognition expands and strengthens the learning processes.

Recommendations

Based on the previous results, the current study recommends the following:

1. Teachers should pay more attention to utilizing CALL in addition to metacognition skills and strategies as a new way of the learning process would support the opportunities for language learning.
2. Activities such as "mind mapping, summarization, analyzing, synthesizing and completing the graphic organizers" should be used in order to raise students' reading comprehension skills.
3. Students should be encouraged and trained to be self-learners, self-managers, good thinkers, self-correctors, problem solvers. They should also use new learning strategies to be able to increase their reading comprehension and motivation.

4. Course designers should make use of computer-based programs to enhance students' reading comprehension and motivation.

References

- Ahangari, S., & Sioofy, M. (2013). The Effect of Computer Assisted Cooperative Language Learning on Iranian High School Students' Language Anxiety and Reading Comprehension. *International Journal of Foreign Language Teaching & Research*, 1(3),34-47.
- Ahmadi, M. R., Ismail, H. N., & Abdullah, M. K. K. (2013). The Importance of Metacognitive Reading Strategy Awareness in Reading Comprehension. *English Language Teaching*, 6(10), 235-244.
- Ali, M. (2005). Effectiveness of computer-based reading instruction in comparison to teacher-based reading instruction. (Doctoral Thesis, Loughborough University, UK, 2005), *Reading in a foreign language*
- Almekhlafi, A.G. (2006). The Effect of Computer Assisted Language Learning (CALL) on United Arab Emirates English as a Foreign Language (EFL) School Students' Achievement and Attitude. *Journal of Interactive Learning Research*, 17(2), 121-142.
- Anderson, R. C., Wilson, P. T., & Fielding, L. G (1988). Growth in reading and how children spend their time outside school. *Reading Research Quarterly*, 23.
- Bax, S. (2011) Normalization revisited: the effective use of technology in language education. *International Journal of Computer-Assisted Language Learning and Teaching* 1(2), 1-15.
- Beatty, K. (2013). *Teaching and Researching Computer-Assisted Language Learning*. Pearson Education. Longman.
- Bentahar, A. (2012). Can ESL Teachers Teach Reading Metacognitive Strategies?. M. A. Degree, Boise State University.
- Broussard, S. C., & Garrison, M. B. (2004). The relationship between classroom motivation and academic achievement

- in elementary school-aged children. *Family and Consumer Sciences Research Journal*, 33(2), 106–120
- Carlson, A. M. (2008). Metacognitive Strategies: Definition, Examples & Quiz. L.12. Retrieved from <https://study.com/academy/lesson/metacognitive-strategies-definition-examples-quiz.html>
- Chambers, A., & Davies, G. (2001). *ICT and language learning: A european perspective* (Vol. 1): CRC Press.
- Costa, A. L., & Kallick, B. (2003). *Assessment strategies for self-directed learning*: Corwin Press.
- Fardy, M., Namdar, L., & Farhadi, S. (2011). The Effect of Using Computer-Assisted Language Learning (CALL) on the Reading Comprehension of Expository Texts for the Iranian University Female Senior. *Journal of Academic and Applied Studies* 1(2), 1-7.
- Flavell, J. H. (1979). Metacognition and Cognitive Monitoring: A new area of cognitive developmental inquiry. *American Psychologist*, 34.
- Gruham, S., & Weiner, B. (1996). Theories and principles of motivation. *Handbook of educational psychology* 4, 63-84
- Guan, J. (2013). Research of Computer-Assisted Language Learning. In *Informatics and Management Science II* (pp. 661-667): Springer
- Guay, F., Chanal, J., Ratelle, C. F., Marsh, H. W., Larose, S., & Boivin, M. (2010). Intrinsic, identified, and controlled types of motivation for school subjects in young elementary school children. *British Journal of Educational Psychology*, 80(4), 711–735.
- Habibian, M. (2015). The Impact of Training Metacognitive Strategies on Reading Comprehension Among ESL Learners. *Journal of Education and Practice*, 6(28), 61-69.
- Hartoyo, M. (2006). Individual Differences in Computer Assisted Language Learning (CALL). In: Universitas Negeri Semarang Press.
- Hyte, H. D. (2002). The effects of computer-based metacognitive strategy training for adult second language learners. *All Theses and Dissertations*

- Jacobson, K. (2009). The characteristics and of motivation attributes on high school students' academic achievement and the implications for Michigan high school in the era of the merit core curricula. Northern Michigan University.
- Januszewski, A. & M. Molenda (2013). *Educational Technology: A definition with commentary*: Routledge
- Kintsch, W. & Rawson, K. (2005) Comprehension. In *Children's reading comprehension and assessment* (pp. 89-110): Routledge
- Knoll, C. L. (2000). The Relationship Between Motivation and Reading Comprehension.
- Lai, E. R. (2011) Motivation: A Literature Review. Retrieved from <http://www.pearsonassessments.com/research>
- Lin, D., Wong, K. K., & McBride-Chang, C. (2012). Reading Motivation and Reading Comprehension in Chinese and English among Bilingual Students. *Reading and Writing*, 25(3), 717–737.
- Liou, H. C. (2000). Assessing learner strategies using computers: New insights and limitations. *Computer Assisted Language Learning*. 13(1), 65-78.
- Marzban, A. (2011) Improvement of reading comprehension through computer-assisted language learning in Iranian intermediate EFL students. *Procedia Computer Science*, 3,3-10
- Middleton, M. (2011). Reading Motivation and Reading Comprehension. M. A. Degree, Ohio State University.
- Monica, P. (2013). Theories of Motivation – Overview of the Content Theories of Motivation. *Education, Health & Medicine, Technology*. Retrieved from <https://www.slideshare.net/featured/category/technology>
- Nishino, N. (2005) Japanese high school students' L2 reading motivation. Lifelong Learning: Proceedings of the 4th Annual JALT Pan-SIG Conference.
- Perfetti, C. A., Landi, N., & Oakhill, J. (2005). The Acquisition of Reading Comprehension Skill. In M. Snowling & C. Hulme (Eds.), *Handbook of The science of reading*:(pp. 227-247).

- Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, 95(4), 667-686.
- Rahnavard, F., & Mashhadi Heidar, D. (2017). The Impact of Computer-Assisted Language Learning (CALL)/Web-Based Instruction on Improving EFL Learners' Pronunciation Ability. *International Journal of Research in English Education*, 2(1), 49-57.
- Razi, S., & Cubukcu, F. (2014). Metacognition and Reading: Investigating Intervention and Comprehension of EFL Freshman in Turkey. *Procedia*, 158, 288-295.
- Recesso, A., & Orill, C. (2008) *Integrating technology into teaching: The technology and learning continuum*: Houghton Mifflin Boston.
- Rehman, A., Bilal, H., Sheikh, A., Bibi, N., & Nawaz, A. (2014). The Role of Motivation in Learning English Language for Pakistani Learners. *International Journal of Humanities and Social Science Vol. 4 No. 1*. (PP. 254-257).
- Sadeghi, A. R., & Soltanian, N. (2010). Motivational and Learning Effects of Computer-aided Procedures on Students' Reading Comprehension. *The Journal of Teaching Language Skills (JTLS)*, 29(3), 107-139.
- Saeidi, M., & Yusefi, M. (2013) The Effect of Computer-Assisted Language Learning on Reading Comprehension in an Iranian EFL Context, in L. Bradley & S. Thouèsny (Eds.), *CALL: Using, Learning, Knowing, EUROCALL Conference Proceedings*, Gothenburg, Sweden, (pp. 259-263).
- Sitthiprom, P. (2012). The Development of English Reading Comprehension Ability Grade 11 Students Using Metacognitive Strategies. *International Journal of Social Science and Humanity*, 2(6), 543-544.
- Takallou, F. (2011). The Effect of Metacognitive Strategy Instruction on EFL Learners' Reading Comprehension Performance and Metacognitive Awareness. *Asian EFL Journal*, (1)13.
- Tan, A., & Nicholson, T., (1997). Flashcards revisited: Training poor readers to read words faster improves their

- comprehension of text. *Journal of Educational Psychology*, 89(2), 276.
- Tercanlioglu, L. (2001). The nature of Turkish students' motivation for reading and it's relation to their reading frequency. *The Reading Matrix*, 1, (2).
- Valley, L. (n.d.). Reading comprehension instruction: A brief Introduction.
<https://pdfs.semanticscholar.org/presentation/7891/a9256610be6b21060d55c8a310fa5d00204a.pdf>
- Weedman, D. L. (2004). Reciprocal teaching effects upon reading comprehension levels on students in 9th grade. *Dissertation Abstracts International*, 64(01), 98A.
- Wells, A. & Mathews, G. (1994). Attention and emotion: A clinical perspective. Hove: Lawrence Erlbaum.
- Whitaker, A. (2009). *The Effects of Computerized Reading Instruction on Comprehension of Second Graders*. The Ohio State University.
- Wigfield, A., & Guthrie, J. T. (1997). Relations of children's motivation for reading to the amount and breadth of their reading. *Journal of Educational Psychology*, 89(3), 420.
- Wigfield, A., Guthrie, J. T., Tonks, S., & Perencevich, K. C. (2004). Children's motivation for reading: Domain specificity and instructional influences. *The Journal of Educational Research*, 97(6), 299-310.

