THE EFFECT OF A CALL PROGRAM ON JORDANIAN SIXTH-GRADE STUDENTS' ACHIEVEMENT

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Abstract

This study examines the potential effect of a computerized instructional program on Jordanian sixth-grade students' achievement in English. Four instruments were utilized: a pre-post achievement test, a student opinionnaire, a teacher opinionnaire, and an observation checklist. The findings reveal a statistically significant difference in student achievement in favor of the experimental group, that teachers and students have positive attitudes towards computer use, and that teachers are committed to computer use in language teaching, more so for those with a computer background. A number of implications and recommendations for future research are put forth.

Introduction and Background

It is a matter of near consensus that the computer, albeit instrumental for teaching and learning, can never replace the teacher (cf., for example, Frizzler, 1995; Kenning & Kenning, 1993; Levy, 1997). However, the use of computers in the classroom has proven advantageous in more than one respect; it has it been found to not only facilitate learning (Goldman, Cole & Syer, 1999) but also to develop students' ability to learn independently, analyze information, think critically, and solve problems (Chavez, 1997), not to mention that it is reported to significantly increase student reading speed and comprehension across studies of computer-assisted reading instruction (Kulik, Bangert & Williams, 1983).

Furthermore, the computer can provide excellent and fairly inexpensive supplementary materials to enhance classroom instruction (Frizler, 1995). It has also been found not only to promote visual, verbal and kinesthetic learning, higher-level thinking, and problem-solving (Turnbull & Lawrence, 2002), but also to offer immediate feedback, hands-on learning, and collaborative instruction (Becker, 2000; González-Bueno, 1997; Koller, 1996; Schulz, 1999; Smith, 2008; Zapata, 2004).

More importantly, now that the paradigm shift from teacher-centered to learner-centered instruction is firmly in place, computer use in learning English as a foreign language (EFL) may help students take ownership of their own learning. This ownership is believed to be conducive to learner's active participation in his/her own learning (see, for example, Brown, 2002; Oxford, 1990).

In Jordan, children start basic education, the onset of formal schooling, at about age of six and continue until the tenth grade at about age of 16. As the quality of basic education essentially holds the key to all future learning (Haddad, 2004; World Education Forum, 2000), it is imperative that it focus on developing the skills of language use for both learning and communication.

In addition to language literacy, Jordanian basic stage students are exposed to computer literacy, embodied in gaining basic knowledge in information and communication technology (ICT), based on claims (cf., for example, Almekhlafi, 2006; Batey, 1986; Becker, 1987) that computer use is especially beneficial for younger children.

As a part of a set of comprehensive reforms, the Ministry of Education (MoE) has taken substantive measures to promote e-literacy among students and improve teaching English as a foreign language (TEFL) by providing a facilitative infrastructure, authentic curricula and feasible teacher training programs. Thousands of computers have been brought into all 1-12 schools. In 2004, 65,000 personal computers (PCs) were installed in 2,250 public schools, bringing the ratio of student to PC from 43:1 in 2001 to 15:1 (Bataineh & Baniabdelrahman, 2006). Even though more recent reports do not provide figures, they posit that the student-computer ratio is still higher than that of wealthier nations (Light, Method, Rockman, Cressman & Daly, 2008).

Computer-assisted language learning (CALL), which encompasses the use of computer applications in language teaching and learning (Levy, 1997), emerged in the early days of computers, in the 1960's, when its first programs were designed and implemented. Since then, the effectiveness of CALL in language teaching and learning has been highlighted by a plethora of empirical research (see, for example, Asay, 1995; Cheon, 2003; Chun & Plass, 1996; Dreyer & Nel, 2003; Lee, 2008; Liou, 1995; Noriko, 2002; Yoon, 2009).

It goes without saying that effective computer use in teaching and learning requires effective instructional programs, the lack of which is frequently given by

teachers as a reason for their reluctance to CALL in their classroom practice (cf., for example, Bonk, 2010; Conrad, 1996).

Purpose and Questions of the Study

Despite the fact that English in Jordanian schools is taught daily with an average of four to six 45-minute sessions a week, students' proficiency is limited and does not always meet the demands of higher education institutions. Complaints have been often voiced that students' preparation in English is weak (cf., for example, Rababah, 2001; Sarayrah, 2003).

The authors claim that CALL has the potential to provide an alternative, or even a supplementary, recourse to enhance the quality of TEFL in Jordan. Thus, it is the purpose of this research to examine the effect of a computerized instructional program on Jordanian basic stage students' achievement.

More specifically, the study attempts to find answers for the following questions:

1. To what extent can CALL utilization in TEFL affect students' achievement in general and that of low-, average- and high-achievers in particular?
2. To what extent does computer use in teaching English affect students' and teachers' opinions about the utility of CALL in TEFL?

Significance of the Study

The major impetus for conducting this study is the need to convince stakeholders (mainly policymakers, teachers, students and parents) that the computer is no longer an expensive luxury item in schools but rather a formidable teaching and learning tool. A plethora of international and local research has been conducted to establish the effectiveness of computer use in language instruction. However, relatively little research has been done on developing computerized instructional programs for TEFL in the Arab region. Thus, undertaking this study is driven by the fact that most related research seems to offer theorization rather than practical programs that can enhance the quality of TEFL in the region in general and Jordan in particular.

It is, thus, hoped that this study will bridge an existing gap, especially in the context of the current computer-related educational reforms in Jordanian institutions of learning. This research is also hoped to establish grounds for further research in this area.

Review of Related Literature

The educational literature has painted a rather favorable picture of the role of Computer-Assisted Instruction (CAI) in facilitating the mastery of various basic skills (Murray, 2001; Nicol & Anderson, 2000). It suggests a variety of uses for computers in the instructional process. Computer use for developing literacy skills is especially significant in the early basic stage (Kim & Kamil, 2002; NAEYC, 1996). NAEYC (1996), for instance, reports that children prefer working on the computer with one or more partners to working alone, which allows them to seek peer assistance and, thus, engage in much oral communication and initiate more frequent and varied interactions than in traditional activities such as puzzles or blocks.

Research on the utility of technology in learning and teaching has been continuous for several decades. However, it has not always yielded consistent results. Some studies have revealed positive effects (cf., for example, Almekhlafi, 2001; Buckley, 2000; Cairncross & Mannion, 2001; James, 1999; Moreno, Mayer, Spires & Lester, 2003; Wydra, 2001) while others have not (cf., for example, McKethan, Everhart & Sanders, 2001; Smith & Woody, 2000).

The use of CALL as a supplement to traditional, teacher-centered instruction has been found to produce achievement effect superior to those obtained with traditional instruction alone. These findings seem to hold true for students of different ages and abilities (see, for example, Al Abdel Halim, 2009; Al-Juhani, 1991; Almekhlafi, 2004; Almekhlafi, 2006; Ayres, 2002; Batey, 1986; Bayraktar, 2002; Bracey, 1987; Chikamatsu, 2003; Crosby, 1997; Fenfang, 2003; Peterson, 1998; Rupe, 1986).

Warschauer, Grant, Del Real and Rousseau (2004) examined two American K-12 schools that successfully utilized high-technology environments to promote learners academic literacy. Both schools were reported to make effective use of technology to promote academic literacy among their students, resulting in sophisticated student products, highly engaged learners, and high standardized test scores in relationship to school demographics.

Similarly, Warschauer and Ware (2008) conducted a multi-site case study to examine literacy practices in 10 American schools where all students had access to laptop computers throughout the school day. The important changes noted in the processes, sources, and products of literacy were along the lines often touted by educational reformers but seldom realized in schools. For example, reading instruction featured more scaffolding and epistemic engagement, whereas student writing became

more public and collaborative, more purposeful and authentic, and more diverse in genre.

Locally, Aweis (1994) reported better reading comprehension for American learners of Arabic as a foreign language who had computer-mediated instruction than for those instructed by the traditional method as did Abu-Seileek (2004) who reported higher scores for students using the computer than those who studied writing by the traditional method. Similarly, Al-Barakat and Bataineh (2008) ascertained the positive effect of information and communication technology (ICT) on schooling in general and on literacy learning in particular. Al Abdel Halim (2009) also provided evidence for the effectiveness of computer-assisted instruction on Jordanian first secondary students' achievement and reading comprehension skills.

However, there are reports, albeit not as substantial, that computer use does not enhance learning. For example, Almekhlafi (2004; 2006) found no significant differences in Emirati sixth-grade students' achievement which can be attributed to the use of an interactive multimedia CD-ROM. Similarly, Vandergrift (2006) found no effect for communication medium (face-to-face vs. synchronous computer-mediated communication) on building common ground as indicated by use of reception strategies.

Attitudes towards CALL and other types of technology have been extensively investigated. In most cases, positive attitudes towards CALL are documented. For example, Robert (2002) and Almekhlafi (2004; 2006) reported positive Emirati students' attitudes towards and perceived relevance of the use of CALL in TEFL. Similarly, Klassen and Milton (1999) reported positive attitudinal changes as a result of a multimedia-enhanced English language learning program at a Hong Kong University.

Along the same lines, Ayres (2002) reported positive students' attitudes towards the use of CALL and a link between students' attitudes and their level of computer literacy, language level, and age. Similarly, Lin and Chen (2007) reported positive effects for different types of computer-generated visuals (static vs. animated) and advance organizers (descriptive vs. question) on Chinese EFL learners' reading proficiency, comprehension and retention of a content-based lesson.

Locally, Bataineh and Baniabedelrahman (2006) and Baniabdelrahman, Bataineh and Bataineh (2007) reported positive perceptions by Jordanian EFL learners of their computer and Internet literacy. In the same vein, Mahfouz and Ihmeideh (2009) reported that Jordanian EFL students have generally positive attitudes towards using video and text chat discourse with anonymous native speakers of English to improve

their English proficiency, albeit more so for speaking than listening, reading, and writing, respectively. Along the same lines, Bani Hani (2009) reported positive teachers and students' attitudes towards computer use in addition to teachers' reported inclination towards continued computer use among both users and non-users of the computer in EFL instruction.

Sampling, Instrumentation and Data Collection and Analysis

To achieve the purpose of the research, two sub-samples were purposefully chosen: 73 students in two intact sixth-grade classes and 100 basic school teachers from the northern region of Jordan. Of the student sub-sample, a simple toss of a coin was used to assign the two sections into a control group (n=36), taught by the traditional method, and an experimental group (n=37), taught by the computerized program. Based on the students' results in the previous semester and on the pre-test results, each group was further divided into three levels: low-achieving students, average-achieving students, and high-achieving students. On a scale of 25, 20-25 was considered high, 13-19 average, and 0-12 low, as shown in Table 1.

Table 1: Sample distribution

	Level	***n***	***% of Group***	***% of Total n***
Control Group	High	4	11.1	5.5
	Average	23	63.9	31.5
	Low	9	25.0	12.3
	Total	36	100.0	49.3
Experimental Group	High	4	10.8	5.5
	Average	21	56.8	30.2
	Low	12	32.4	15.0
	Total	37	100.0	50.7

Table 1 shows that the number of high-achieving students in both groups is the same (4 in each) while the number of average-achieving students is close (23 vs. 21), and the number of low-achieving students is similar with 9 students in the control group and 12 in the experimental group.

Of the teacher sample, 52 teachers reportedly use the computer to teach English and 48 do not do so. As the literature (cf., for example, Cushman & Klecun, 2006;

Getty, Ryan & Ekins, 1999) suggests different attitudes for computer users and non-users, the authors seek to examine if these findings hold true in this particular context.

The instructional program consists of units 13 and 14 of the sixth-grade textbook *Action Pack*. Sixth-grade was targeted because it is an intermediary link between the five preceding grades and the six subsequent ones, not to mention that the students' age, mostly 12 years, is considered critical in language learning. Unit 13, *Accidents can Happen*, was chosen as the content for the program because of its relevance to children in this age group. It addresses real life situations faced by small children and offers helpful guidance. Unit 14, *We're in Petra*, was chosen because it is about a very significant Jordanian heritage site which has recently received a lot of media coverage and been acclaimed as one of the World's Seven Wonders.

In the design stage of the program, the researchers enlisted the help of five experts in educational technology from the Department of Curriculum and Instruction at Yarmouk University (Irbid, Jordan). In addition, an expert in visual basic, an expert in curriculum digitization from the Ministry of Education, two computer engineers and two computer instructors from Al-Balqa' Applied University (Irbid, Jordan) participated in the two-month design process. Several individual and group meetings were organized to get initial guidance and feedback. Subsequently, a computer programmer, with whom periodic meetings were organized to keep him abreast of the developments and feedback from the other experts, executed the design, and a prototype storyboard, a written copy of the program, was developed and distributed to a jury of experts in methodology, instructional technology and computer science to establish validity and provide feedback. The prototype was modified per the jury's feedback and then computerized under the direct supervision of the researchers.

The final copy of the program was given to a jury of three computer and methods specialists for re-evaluation, and the program was modified and ready for implementation. It is worth noting here that a reliability check of the instructional program was virtually impossible, because the two units which comprised its content were to be taught at all primary schools at the same period.

One teacher, who had been trained on the use of the program, taught both the experimental and the control groups to ensure equivalence and avoid any potential bias. The students of the experimental group were also briefed about the program.

After the teacher and the students had been briefed, the infrastructure of the computer laboratory was optimized to meet the needs of the program installation and

processing, where some computers were reformatted or supplied with speakers for the listening part. *Visual Studio* was installed on all computers to optimize viewing of the pictures in the program.

Minimum knowledge of the computer is required to operate the program. As most of the participating students are of low English ability, the additional burden of complicated instructions was alleviated.

The content of the program is a computerized version of the content of the two units under study. Minimal changes were made in the textbook content itself, except when the computerization required slight modifications to fit the medium. The major types of activities involve the integration of listening, speaking, reading, and writing. More specifically, activities such as *listen and tell the story*, *listen and make statements and questions*, *listen, ask and answer questions*, *listen and correct the statements*, *complete the text*, *complete the sentence*, *complete the letter*, *discuss*, and *write about the map* comprise the bulk of the content of the program.

Following correct answers, immediate applause, in the form of a sound of clapping hands, is provided. Students are also allowed another chance to amend incorrect responses, which, if answered correctly, are also followed by applause, as immediate feedback is believed crucial for the students' motivation and time-on-task (Cubillos, 1998; Frommer, 1998; Scida & Saury, 2006).

To achieve the objectives of the study four instruments[1] were used: a pre-post achievement test, a teacher opinionnaire, a student opinionnaire, and an observation checklist. The pre-post achievement test, which was computerized for the experimental group, aimed to measure the students' achievement at the onset of the experiment and any potential gain in their achievement at its end. It consisted of 25 items (13 on Unit 13 and 12 on Unit 14) which cover listening and reading (7 items), writing (2 items), vocabulary (6 items), and grammar (10 items). It also consisted of three types of questions: true/false, multiple choice, and fill-in-the-blanks. The highest possible score on the test is 25 points (one per item).

The literature suggests that teachers have varying attitudes and perceptions about the benefits of computer technology (Rother, 2004). Many teachers often feel that they do not have the know-how to properly integrate computers into their instruction (Charp, 2003; Romano, 2003; Rother, 2004), even though many abhor the additional burden of

[1] For a copy of any of these instruments, contact the corresponding author at rubab @ yu.edu. jo.

computer training on top of their other responsibilities (Cook, 2006). Furthermore, empirical evidence abounds about how teachers may perceive the computer as an obstacle, distraction, or even a threat to their job security (Romano, 2003).

The authors have incorporated the teacher opinionnaire into the instruments of the study to further examine this issue and offer evidence on this particular context. More specifically, the teacher opinionnaire aimed to (1) determine overall teachers' opinion about the utility of CALL in TEFL, (2) examine their inclination to use CALL in the future, and (3) measure the extent to which they are qualified to implement CALL in their classes.

The teacher opinionnaire had two main sections. The first one, which consists of 15 items, was meant for teachers who use the computer in TEFL whereas the second section, which consisted of 10 items, was meant for teachers who do not use the computer in their instruction.

A good number of experts in TEFL, instructional technology and psychology advocate a learner-centered approach to instruction, which entails a more effective learner role in his/her own learning. To this end, the 15-item student opinionnaire, which was constructed to administer at the end of the experiment to only the experimental group students, examines students' opinions about the utility of the computer in learning English. Since sixth-grade students are essentially weak in English, the opinionnaire was translated into Arabic to avoid any obstacles brought about by the students' limited language ability.

To oversee the process of implementation**,** the first researcher unobtrusively attended all the sessions of the experimental group and the control group which was instructed through more traditional methods such as lecture, class discussion and individual practice. The observation was also conducted to ensure that the instructional program was implemented correctly.

Validity and reliability of the instruments

A jury of seven university professors of curriculum and instruction, instructional design, measurement and evaluation, and educational technology were asked to validate the instruments. The validation process brought about a number of changes in terms of the number of, length of, and overlap among items. The translated version of the opinionnaire was also subjected to rigorous validation by two EFL professors.

To establish the reliability of the pre-/post test, it was administered to an outside sample of 28 sixth-grade students from Abu-Baker basic school for boys, Irbid, Jordan. Two weeks later, the same test was administered to the same sample. The correlation between the first and the second administrations amounted to 0.82, which was deemed appropriate for the purpose of the research.

Data collection

The data were collected from one school (viz., Mua'd Bin Jabal for Boys) in Irbid First Directorate of Education. The computer laboratory in which the experiment took place consists of 18 computers and a data show which was used to demonstrate exercises. Pre-test scores and students' scores in the preceding semester were acquired in order to divide the experimental and control groups into low-, average-, and high- achieving students.

The experiment started on the first of April 2009, during which the teacher opinionnaire was distributed. At the end of the experiment, the test was re-administered to gauge any potential gain in achievement and provide grounds for comparison. The student opinionnaire was administered to the experimental group one day after the treatment which lasted four weeks (20 class sessions).

For the researchers to control the variables of the study and avoid the potential effect of any foreign variables, the first researcher attended all twenty sessions of the experiment for both the experimental and control groups. Before the experiment, he attended three classes in each group to blend into the setting and get the students to participate and interact in the class without perceiving him as a threat. By the time the experiment started, the students had begun to feel that he is part of the class and were enthusiastic and eager to participate.

To ensure the equivalence of the two groups, the pre-test was administered simultaneously to both groups. Means, standard deviations and t-test statistics were used to detect any differences between the two groups, as shown in Table 2.

Table 2: Means, standard deviations and t-test statistics of the students' scores on the pre-test.

Group	***n***	***Mean***	***Standard Deviation***	***t***	***Df***	***Sig.***
Control	36	13.58	2.72	0.38	71	0.699
Experimental	37	13.86	3.42			

Table 2 shows no statistically significant difference at (α=0.05) between the two groups. The control group has a mean of 13.58 while the experimental group has a mean of 13.86, which indicates that their level of achievement is quite similar.

Findings and Discussion

To answer the first part of the first research question, *to what extent can CALL utilization in TEFL affect student achievement*, means, standard deviations, and a t-test were calculated for the students' overall scores on the post test, as shown in Table 3.

Table 3: Means, standard deviations and t-test statistics of the students' scores on the post test.

Group	***n***	***Mean***	***Standard Deviation***	***t***	***Df***	***Sig.***
Control	36	15.5	3.31	4.901	71	0.000 *
Experimental	37	18.97	2.71			

Table 3 shows a statistically significant difference at (α=0.05) in student achievement between the control and experimental groups in favor of the latter. This indicates that the experimental group, taught through CALL, showed more gains in achievement than the control group.

To answer the second part of the first research question, *to what extent can CALL utilization in TEFL affect the achievement of low-, average- and high-achieving students*, percentages were calculated for each level before and after the treatment, as shown in Table 4, to provide grounds for comparison with those of the experimental group .

Table 4: Levels of control group students before and after the treatment.

	Level after			***Total***
	Low	***Average***	***High***	

Level Before	***Low***	*Count* *% of Total*	5 13.90	3 8.30	1 2.80	9 25.00
	Average	*Count* *% of Total*	1 2.80	13 36.10	9 25	23 63.90
	High	*Count* *% of Total*	1 2.80	2 5.60	1 2.80	4 11.10
Total		*Count* *% of Total*	7 19.70	18 50.00	11 30.6	36 100.00

Table 4 shows that while low-achieving students initially constituted 25% of the control group, their number declined to just under 20%, showing a 5% gain in achievement. It also shows that out of the average-achieving students in the control group, who amounted to about 64%, about 14% showed a gain in achievement, bringing the percentage down to 50. Similarly, the percentage of high-achieving students in the control group rose from 11% to nearly 31%, showing an impressive increase of 20%.

Note how the traditional method mostly affected average- and high-achieving students since almost 14% of the former advanced into high achievement. On the other hand, low-achieving students were the least affected group, which is consistent with research findings that teachers generally pay more attention to average- and high-achieving students than their weaker counterparts. Table 5 shows the effect of the treatment on the experimental group.

Table 5: Levels of experimental group students before and after the treatment.

			Level after			***Total***
			Low	***Average***	***High***	
Level Before	***Low***	Count % of Total	1 2.70	4 10.8	7 18.9	12 32.4
	Average	Count % of Total	0 0	4 10.8	17 46	21 56.8
	High	Count % of Total	0 0	0 0	4 10.8	4 10.8
Total		Count % of Total	1 2.7	8 21.6	28 75.7	37 100

Table 5 shows that while low-achieving students initially constituted 32% of the experimental group, their number declined to just under 3%, indicating a substantial

29% gain in achievement. it also shows that of the average-achieving students in the experimental group, who amounted to about 57%, about 22% showed a gain in achievement, bringing the percentage down to 35. Similarly, the percentage of the high-achieving students in the experimental group rose from 11% to an impressive 76% after the treatment.

Note how the gains in achievement not only encompassed all three levels of students in the experimental group but also substantially surpassed the percentages of gains by the control group. Before the treatment, the mean of the experimental and control groups was just under 14%, but the gain in achievement was relatively more substantial for the former (viz., 5% vs. 2%).

The authors claim that this gain in achievement may be attributed to the utilization of the computerized program. Several factors may have contributed to this gain, most important amongst which are the novelty of the experience which may have contributed, in turn, to student eagerness to learn, the self-paced nature of the computerized activities, the superior visual representation of the materials in the program, the animated immediate feedback feature which may have motivated the learners to stay on task, and the simplicity of the program which enabled learners to navigate easily and, thus, motivated low- and average- achieving students to learn.

Furthermore, the individualization feature of the program may have been responsible for low- and average-achievers' gain in achievement. Unlike traditional instruction, which has been reported to give scant attention to weaker students, CALL use potentially reinforces learning, both current and previous, through self-paced learning and repeated exposure to language (Warschauer, 1996) and, thus, weaker students reaped additional benefits than those afforded by traditional instruction. Those learners who are usually most reluctant to participate publically in the classroom, for fear of embarrassment and loss of face, were encouraged to do so in the privacy afforded by the program, which reflected positively on their achievement.

To answer the second research question, *to what extent does computer use in teaching English affect students' and teachers' opinions about the utility of CALL in TEFL,* the student opinionnaire was administered to the experimental group immediately after the experiment to identify students' opinions about the utility of computer use in learning English, as shown in Table 6.

Table 6: Frequencies, percentages and Chi-Square statistics of the student opinionnaire.

Item	***Response***	***Frequency***	***%***	***Chi Square***	***df***	***SIG***
I prefer to learn English with the computer rather than the textbook.	Yes	27	73	7.81	1	0.005*
	No	10	27			
I think the computer can be a playing tool.	Yes	29	78	11.92	1	0.001*
	No	8	22			
I think the computer can be a useful teaching tool.	Yes	25	68	4.57	1	0.033*
	No	12	32			
I think my computer skills helped me learn English better.	Yes	28	76	9.76	1	0.002*
	No	9	24			
My achievement in English improved after using the computer.	Yes	31	84	16.89	1	0.000*
	No	6	16			
I felt that learning English by the computer was easy.	Yes	28	76	976	1	0.002*
	No	9	24			
I think that the computer can help me learn more by myself.	Yes	26	70	6.08	1	0.014*
	No	11	30			
The computer brings learning closer to real-.life environment.	Yes	34	92	25.97	1	0.000*
	No	3	8			
When I used the computer to learn English, I felt confident.	Yes	35	95	29.43	1	0.000*
	No	2	5			
I could understand the instructions easily on the computer.	Yes	31	84	16.89	1	0.000*
	No	6	16			
When I used the computer, I needed help from my teacher.	Yes	26	70	6.08	1	0.014*
	No	11	30			
The computer helped me interact with my teacher and classmates.	Yes	36	97	33.11	1	0.000*
	No	1	3			
I think that the computer motivated me to learn.	Yes	35	95	29.43	1	0.000*
	No	2	5			
I would like to continue using the computer in learning English.	Yes	36	97	33.11	1	0.000*
	No	1	3			
I felt excited when I sat in front of the screen to learn English.	Yes	36	97	33.11	1	0.000*
	No	1	3			
Total		*37*	*100*			

Table 6 shows that over 97% of the students in the experimental group reported being excited by CALL, about 95% reported that the computer enhanced their motivation to learn, and over 97% expressed willingness to continue learning through the computer. In addition, a little over 97% claimed that the computer helped them better interact with

their teacher and classmates. The findings further revealed that about 84% of the respondents reported that the computer helped them improve their achievement compared to about 95% who believed that the computer helped them boost their self-confidence.

The authors attribute these positive attitudes towards the computer to that the computerized program did not require advanced computer skills, that it provided immediate feedback which not only motivated the students but also reinforced their previous learning, not to mention that it provided them with a novel way of learning language which raised their awareness of the computer not only as a tool for entertainment but also as a viable one for learning.

To examine the teachers' opinions about the utility of computer use in TEFL, the teacher opinionnaire was administered to both computer users and non-users, as shown in tables 7 and 8 below.

Table 7: Computer users' opinions about the utility of CALL in TEFL.

Item	***Response***	***Frequency***	***%***	***Chi Square(a)***	***df***	***. Sig.***
I prefer to teach English via the computer rather than the textbook.	Yes	39	75.0	13.000	1	0.000*
	No	13	25.0			
I felt more confident when I used the computer in my class.	Yes	44	84.6	24.923	1	0.000*
	No	8	15.4			
I think that the computer could help my students learn by themselves.	Yes	38	73.1	11.077	1	0.001*
	No	14	26.9			
I think my students understood the instructions on the computer.	Yes	38	73.1	11.077	1	0.001*
	No	14	26.9			
I believe the computer can bring the activities closer to real life.	Yes	45	86.5	27.77	1	0.000*
	No	7	13.5			
My computer skills help me in using the computer to teach.	Yes	44	84.6	24.92	1	0.000*
	No	8	15.4			
When using the computer, I did not need help from the technician.	Yes	36	69.2	7.69	1	0.006*
	No	16	30.8			
My students were positively interacting with the computer.	Yes	48	92.3	37.23	1	0.000*
	No	4	7.7			
My students' achievement improved with computer use.	Yes	49	94.2	40.69	1	0.000*
	No	3	5.8			
I prefer testing on the computer to on the papers.	Yes	36	69.2	7.69	1	0.006*
	No	16	30.8			
The computer provides students with immediate feedback.	Yes	50	96.2	44.31	1	0.000*
	No	2	3.8			
I think the computer can be a teaching tool.	Yes	51	98.1	48.08	1	0.000*
	No	1	1.9			
A course on CALL should be provided at universities.	Yes	50	96.2	44.31	1	0.000*
	No	2	3.8			
I advise my colleagues to use the computer in their classes.	Yes	51	98.1	48.08	1	0.000*
	No	1	1.9			
I will continue using the computer in teaching English.	Yes	51	98.1	48.08	1	0.000*
	No	1	1.9			

Table 7 shows that the teachers who reportedly use the computer have generally favorable opinions about the utility of CALL in TEFL, with about 94% noting their students' gain in achievement with computer use. The findings further revealed that while 98% of the respondents view the computer as a viable instructional tool in TEFL, 96% expressed a dire need for a CALL component in pre-service teacher training.

These heartening findings seem to suggest that Jordanian basic stage teachers have the inclination to use the computer in their instruction, probably because it has the potential to aid learning with relatively less teacher effort.

Table 8: Computer non-users' opinions about the utility of CALL in TEFL.

Item	***response***	***Frequency***	***%***	***Chi-Square(a)***	***df***	***Sig.***
I think the computer can help me teach English to my students.	Yes	42	87.5	27.00	1	0.000*
	No	6	12.5			
I believe using the computer will save time and effort.	Yes	45	93.8	36.75	1	0.000*
	No	3	6.3			
If the textbook is well-computerized, I will use it with no hesitation.	Yes	46	95.8	40.33	1	0.000*
	No	2	4.2			
I was not trained on using the computer, so I am not ready for it.	Yes	39	81.3	18.75	1	0.000*
	No	9	18.8			
I think using the computer may cause many technical problems.	Yes	40	83.3	21.33	1	0.000*
	No	8	16.7			
My computer skills are not enough to take the chance.	Yes	44	91.7	33.33	1	0.000*
	No	4	8.3			
Students' computer skills are not good enough to use the computer.	Yes	38	79.2	16.33	1	0.000*
	No	10	20.8			
My students see the computer as a game rather than a learning tool.	Yes	42	87.5	27.00	1	0.000*
	No	6	12.5			
The number of the computers in the lab is not enough.	Yes	47	97.9	44.08	1	0.000*
	No	1	2.1			
I do not believe that the computer will replace me as a teacher.	Yes	43	89.6	30.08	1	0.000*
	No	5	10.4			

Table 8 shows that about 98% of the teachers who do not use computers in their instruction claimed that the number of computers in the school laboratories is not adequate for teaching English. However, about 96% of those reported that if textbooks were computerized, they would use them without hesitation. Furthermore, almost 94% of the teachers believed that the computer can save teacher time and effort, even though about 92% of those reported that they are not literate enough to use the computer in their instruction.

The authors believe that these results are promising since most teachers seem to have a positive predisposition towards CALL implementation in TEFL despite their evident awareness of the barriers facing this implementation in the Jordanian TEFL context. For example, almost all respondents reported an inadequate number of computers in Jordanian schools, which is an obvious problem, not to mention that a sweeping 92% expressed their need for more training on instructional computer use. In other words, Jordanian teachers do not reportedly suffer from technophobia but are rather willing to implement technology in their classroom, which is most evident in their claims of willingness to use computerized textbooks. However, they are also aware

of the obstacles facing this implementation, which represents a challenge for both the Jordanian MoE and teacher training institutions.

To ascertain proper implementation and, thus, credibility of the findings, on-site classroom observations were conducted during the intervention. The second author unobtrusively attended all sessions without interfering in anyway except for the provision of relevant feedback after each session.

Almost all students were visibly excited and, later, reflected positively on the effectiveness of CALL, which was further evidenced by the relatively substantial amount of participation observed. Unlike the control group, virtually every student in the experimental group answered at least one question in each CALL session.

As for the control group, the teacher would invariably enter the classroom, greet his students and, immediately, ask them to open their books to a particular page. The teacher would then write the new vocabulary on the chalkboard and read each one aloud while the students repeated after him. Then, the words would be translated into Arabic and the students asked to write them in their notebooks. On average, a maximum of four students would participate while the rest watched with one or two students raising their hands every now and then. In addition, little feedback was provided and minimal student-student interaction was observed. Not once did the teacher use any visual aids. Even the tape recorder, the most commonly used audiovisual aid in Jordanian basic stage classes, was not used, and when the researcher asked about the reason the teacher explained that it was broken and proceeded to read the text aloud.

It was always the same routine. There was scant feedback, little motivation, and very little interaction. Here was an English classroom with a teacher, sitting among EFL learners, but, surprisingly, English was hardly being used.

Conclusions, Recommendations, Implications, and Limitations

The findings suggest that achievement is significantly affected by the medium of instruction, as marked differences are found between the achievement of traditionally- and computer-instructed participants in favor of the latter. Additionally, the use of the program was found to foster not only motivation but also classroom interaction, especially student-student, student-teacher, and student-computer.

Most heartening is, contrary to previous research findings (cf., for example, Romano, 2003), that participating teachers were reportedly not afraid of technology but rather aware of the obstacles facing successful CALL implementation in the EFL

classroom. They showed positive attitudes towards the use of CALL in TEFL but, at the same time, urged the MoE to take measures to equip schools with the necessary infrastructure for successful CALL implementation. Prior experience with technology use was found to be a positive determinant of teachers' CALL implementation, which further supports the authors' initial call for CALL integration in pre- and in-service teacher education.

As the scope of this research is limited to the basic stage, it is recommended that it be extended to investigate the effect of CALL on learning English in the secondary stage, the last two grades of formal schooling, especially in areas like achievement, motivation, self-expression, and the integration of language skills.

Based on the results of the study, the following implications can be drawn:

1. CALL is a potentially useful tool in TEFL, to supplement face-to-face instruction rather than replace it, that should be addressed throughout pre- and in-service teacher education.
2. CALL is a catalyst for remediation, especially with limited language proficiency learners who would thrive on capabilities such as self-paced, learner-centered instruction and immediate feedback.
3. EFL teachers should be encouraged to integrate CALL in their instruction to take advantage of the appealing, threat-free learning environment.

Despite the rigor of the present research, its major limitations are the relatively small sample size and narrow focus. Future studies should involve a larger number of subjects selected from a more diverse pool of students from various class levels. The fact that this study focused on sixth-grade students' achievement suggests that CALL is a potentially effective instructional technique at this level. However, further research is needed not only to substantiate these findings but also to warrant their generalizability to other contexts.

References

Abu-Seileek, A. (2004). *Designing a Computer-Assisted Language Learning (CALL) Program and Testing its Effectiveness on Students' Writing Ability in English.* Unpublished Ph.D. Dissertation, Amman Arab University for Graduate studies Amman, Jordan.

Al Abdel Halim, A. (2009). *Designing a Computer-Assisted Language Learning Program (CALL) and Measuring its Effect on Jordanian Secondary School Students' Reading Comprehension in English.* Unpublished Ph.D Dissertation, Yarmouk University, Irbid, Jordan.

Al-Barakat, A. & Bataineh, R. (2008). Jordanian student teachers' use of computers to develop primary stage pupils' literacy skills. *International Journal of Education and Development Using ICT*, 4(4), 1-21.

Al-Juhani, S. (1991). *The Effectiveness of Computer-Assisted Instruction in Teaching English as a Foreign Language in Saudi Secondary School.* Unpublished PhD Dissertation, University of Denver, U.S.A.

Almekhlafi, A. (2001). Instructional media for teachers' preparation. *International Journal of Instructional Media*, 28(2), 191-207.

Almekhlafi, A. (2004). The effect of interactive multimedia on learning English as a Second Language. *Proceedings of the Fifth Annual UAE University Research Conference.* April 25-27, Al-Ain: United Arab Emirates, 2(3), 39.

Almekhlafi, A. (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.

Asay, D. (1995*).* Does it work? Evaluating the effectiveness of multimedia vocabulary tutor. *Proceedings of the 1995 Annual Symposium: Computer and Collaborative Learning*, 3(4), 14.

Aweis, S. (1994). Situating learning in technology: The case of computer-mediated reading supports. *Journal of Educational Technology Systems,* 23(1), 63-74.

Ayres, R. (2002). Learner attitudes towards the use of CALL. *Computer-Assisted Language Learning Journal*, 15(3), 241-249.

Bani Hani, N. (2009). *Designing an English Computerized Instructional Program for Jordanian Sixth Grade Students and Measuring Its Effect on their Achievement*. Unpublished Doctoral Dissertation, Yarmouk University, Irbid, Jordan.

Baniabdelrahman, A. Bataineh, R. & Bataineh, R. (2007). Jordanian EFL students' perceptions of their use of the Internet. *Teaching English with Technology*, 3(1). Retrieved April 6, 2009 from http://iatefl.org.pl/call/j_article29.htm.

Bataineh, R. & Baniabdelrahman, A. (2006). Jordanian EFL students' perceptions of their computer literacy: An exploratory case study. *International Journal of Education and Development Using ICT*, 2(2). Retrieved December 19, 2008 from http://ijedict.dec.uwi.edu/viewarticle.php?id=598&layout=html.

Batey, A. (1986). Building a case for computers in elementary classrooms: A summary of what the researchers and the practitioners are saying. Paper presented at the Second Leadership in Computer Education Seminar. Seattle: Washington, DC: USA.

Bayraktar, S. (2002). A meta-analysis of Computer-Assisted Instruction in science education. *Journal of Research on Technology in Education*, 34(2), 173-188.

Becker, H. (1987). The impact of computer on children's learning: What research has shown and what it has not. Paper presented at the Annual Meeting of the American Educational Research Association. Washington DC: USA.

Becker, H. (2000). Pedagogical motivations for student computer use that lead to student engagement. *Educational Technology*, 40, 5-17.

Bonk, C. (2010). Overcoming the Technology Resistance Movement. Retrieved December 19, 2010 from http://www.insidetheschool.com/articles/overcoming-the-technology-resistance-movement/.

Bracey, G. (1987). Computer-Assisted Instruction: What the research shows. *Electronic Learning*, 7(3), 22-23.

Brown, H. (2002). *Strategies for Success: A Practical Guide to Learning English*. New York: Addison Wesley Longman Inc.

Buckley, B. (2000). Interactive Multimedia and Model-Based Learning in biology. *International Journal of Science Education*, 22(9), 895-935.

Cairncross, S. & Mannion, M. (2001). Interactive Multimedia and learning: Realizing the benefits. *Innovations in Education and Teaching International*, 38(2), 156-164.

Charp, S. (2003). Technology integration in teaching and learning. *Journal of Educational Multimedia and Hypermedia*, 7(4), 333-363.

Chavez, C. (1997). Students take flight with Daedalus: Learning Spanish in a networked classroom. *Foreign Language Annals*, 30(1), 27-37.

Cheon, H. (2003). The viability of Computer Mediated Communication in the Korean secondary EFL classroom. *Asian EFL Journal*, 5(1), 15-51.

Chikamatsu, N. (2003). The effects of computer use on L2 Japanese writing. *Foreign Language Annals*, 36(1), 114-127.

Chun, D. & Plass, J. (1996). Effects of multimedia annotations on vocabulary acquisition. *Modern Language Journal*, 80(2), 183-198.

Conrad, K. (1996). CALL-Non-English L2 instruction. *Annual Review of Applied Linguistics*, 16, 158-181.

Cook, C. (2006). Exploring the use of interactive multimedia as an instructional resource in Middle Schools of Northwest Ohio. Retrieved November 29, 2010 from http://etd.ohiolink.edu/send-pdf.cgi/Cook%20Casey.pdf?bgsu1143487641.

Crosby, M. (1997). Guest editorial: CALL in L1. *Computer-Assisted Language Learning*, 10(4), 309-319.

Cubillos, J. H. (1998). Technology: A step forward in the teaching of foreign languages? In J. Harper, M. Lively, & M. Williams (Eds.), *The Coming of Age of the Profession: Issues and Emerging Ideas for the Teaching of Foreign Languages* (37-52). Boston: Heinle & Heinle.

Cushman, M. & Klecun, E. (2006). I've never tried it because I don't like it: Enabling technology choices. Paper presented at the Information, Communication and Society Conference, York, United Kingdom, September 20-22. Retrieved May 29, 2010 from http://penceil.lse.ac.uk/documents/12_Ive_ Never_tried_it.pdf.

Dreyer, C. & Nel. C. (2003). Teaching reading strategies and reading comprehension within a Technology-Enhanced Learning Environment. *System*, 31, 349-365.

Fenfang, H. (2003). Learners' behaviors in computer-based input activities elicited through tracking technologies. *Computer-Assisted Language Learning*, 16(1), 5-29.

Frizzler, K. (1995). *The Internet as an Educational Tool in ESOL Writing Instruction*, Unpublished Master's Thesis, San Francisco State University. Retrieved November 3 2008 from http://tesl-ej.org/ej43/a3.html.

Frommer, J. G. (1998). Cognition, context, and computers: Factors in effective foreign language learning. In J. Muyskens (Ed.), *New Ways of Learning and Teaching: Focus on Technology and Foreign Language Education* (199-223). Boston: Heinle & Heinle.

Getty, M., Ryan, A. & Ekins, M. (1999). A comparative study of the attitudes of users and non-users towards computerized care planning. *Journal of Clinical Nursing*, 8(4), 431-439.

Goldman, S., Cole, K. & Syer, C. (1999). The technology/content dilemma. Paper presented at the Secretary's Conference on Educational Technology. Retrieved June 3, 2008 from http://www.ed.gov/technology/techConf/1999/ whitepapers/%20paper%204.html.

González-Bueno, M. (1997). Voice-Onset-Time in the perception of foreign accent by native listeners of Spanish. *IRAL*, 35(4), 251-267.

Haddad, W. (2004). Technologies for education for all: A luxury or a necessity? Paper presented at the Conference of the Ministers of Education of Arab States, Beirut, Lebanon, January 20-23. Retrieved November 29, 2010 from http://www.knowledgeenterprise.org/pdfs/UNESCO_Beirut.pdf.

James, R. (1999). Navigating CD-ROMs: An exploration of children reading interactive narratives. *Children's Literature in Education*, 30(1), 47-63.

Kenning, M. & Kenning, M. (1993). *An Introduction to Computer-Assisted Language Teaching.* London: Oxford University Press.

Kim, H. & Kamil, M. (2002). Successful uses of computer technology in reading instruction. Retrieved March 26, 2008 from http://www.temple.edu/lss/%20LivingDocuments%20/PDF/KimKamil_summary.pdf.

Klassen, J. & Milton, P. (1999). Enhancing English language skills using multimedia: Tried and tested. C*omputer-Assisted Language Learning*, 12(4), 281-294.

Koller, E. (1996). Overcoming paradigm paralysis: A high school teacher revisits foreign language education. In Burnaford, G., Fischer, J. & Hobson, D. (eds.), *Teachers Doing Research*: *The Power of Action through Inquiry* (180-191). United Kigdom: Stratford Books.

Kulik, J. Bangert, R. & Williams, G. (1983). Effects of computer-based teaching on secondary school students. *Journal of Educational Psychology*, 75, 19-26.

Lee, L. (2008). Focus-on-form through collaborative scaffolding in expert-to-novice online interaction. *Language Learning and Technology*, 12(3). Retrieved July 13 2009 from http://llt.msu.edu/vol12num3/lee.pdf.

Levy, M. (1997). *Computer-Assisted Language Learning, Context and Conceptualization*. Oxford: Clarendon Press.

Light, D., Method, F., Rockman, C., Cressman, C. & Daly, J. (2008). *Overview and Recommendations to the Jordanian Education Initiative*. USAID. Retrieved December 19, 2010 from http://pdf.usaid.gov/pdf_docs/PDACL689.pdf.

Lin, H. & Chen, T. (2007). Reading authentic EFL text using visualization and advanced organizers in a multimedia learning environment. *Language Learning and Technology*, 11(3), 83-106.

Liou, H. (1995). Evaluation of interactive videodisc courseware: Effects of strategy training and collaborative learning. In F. Borchardt & E. Johnson (Eds.), *Proceedings of the CALICO 1995*

Annual Symposium, Computers and Collaborative Learning (112-115). Raleigh, North Carolina: CALICO.

Mahfouz, S. & Ihmeideh, F. (2009). Attitudes of Jordanian university students towards using online chat discourse with native speakers of English for improving their language proficiency. *Computer-Assisted Language Learning*, 22(3), 207-227.

McKethan, R., Everhart, B. & Sanders, R. (2001). The effects of multimedia software instruction and lecture-based instruction on learning and teaching cues of manipulative skills on preservice physical education teachers. *Physical Educator*, 58(1), 2-13.

Moreno, R., Mayer, R., Spires, H. & Lester, J. (2003). The case for social agency in computer-based teaching. Do students learn more deeply when they interact with animated pedagogical agents? *Cognition and Instruction*, 19(2), 177-213.

Murray, F. (2001). Use of PowerPoint to increase reading and language skills: A research-based approach. *Eric Document* (ED 458 738).

NAEYC. (1996). *Technology and Young Children Ages 3 through 8*. Washington, DC: *NAEYC*.

Nicol, M. & Anderson, A. (2000). Computer-assisted vs. teacher-directed teaching of innumeracy in adults. *Journal of Computer-Assisted Learning*, 16, 184-192.

Noriko, N. (2002). BANZI: An application of Natural Language Processing to Web-Based Language Learning. *CALICO Journal*, 19(30), 583-599.

Oxford, R. (1990). *Language Learning Strategies: What Every Teacher Should Know*. Boston: Heinle & Heinle.

Peterson, M. (1998). Guest editorial. *Computer-Assisted Language Learning*, 11(4), 347-348.

Rababah, G. (2001). *An Investigation into the Strategic Competence of Arab Learners of English at Jordanian Universities*. Unpublished Doctoral Dissertation. University of Newcastle upon Tyne, UK.

Robert, A. (2002). Learner attitudes towards the use of CALL. *Computer-Assisted Language Learning*, 15(3), 241-249.

Romano, M. (2003). *Empowering Teachers with Technology*. Lanham, Maryland: Scarecrow Press.

Rother, C. (2004). Evaluating technology's role in the classroom. *THE Journal*, 32(3), 43-49.

Rupe, V. (1986). A study of Computer-Assisted Instruction: Its uses, advantages, and limitations. *ERIC Document* (ED 282 513).

Sarayrah, Y. (2003). Resistance to innovative teaching methods in public administration education in Jordan. Paper presented at the Public Administration: Challenges of Inequality and Exclusion, International Association of Schools and Institutes of Administration, Miami, Florida (USA), 14-18 September. Retrieved May 19, 2010 from http://unpan1.un.org/intradoc/groups/public/documents/IIAS/UNPAN011232.pdf.

Schulz, R. (1999). Foreign language: Instruction and curriculum. *The Educational Digest*, 64(7), 29-37.

Scida, E. & Saury, R. (2006). Hybrid courses and their impact on student and classroom performance: A case study at the University of Virginia. *CALICO Journal*, 23(3), 517-531.

Smith, B. (2008). Methodological hurdles in capturing CMC data: The case of the missing self-repair. *Language Learning and Technology*, 12(1), 85-103.

Smith, S. & Woody, P. (2000). Interactive effect of multimedia instruction and learning styles. *Teaching of Psychology*, 27(3), 220-223.

Turnbull, M. & Lawrence, G. (2002). Computers make sense according to brain research…But what do students think? Canadian Association of Second Language Teachers. Retrieved December 6, 2008 from http://www.caslt.org/index_en.php.

Vandergrift, I. (2006). Negotiating common ground in Computer-mediated versus face-to-face discussions. *Language Teaching and Technology*, 10(1), 110-138.

Warschauer M. (1996). Computer-Assisted Language Learning: An introduction. In S. Fotos (Ed.), *Multimedia Language Teaching* (3-20), Tokyo: Logos International.

Warschauer, M. & Ware, M. (2008). Learning, change, and power: Competing discourses of technology and literacy. In J. Coiro, M., Knobel, C. Lankshear, & D. J. Leu (Eds.), *Handbook of Research on New Literacies* (215-240). New York: Lawrence Erlbaum Associates.

Warschauer, M., Grant, D., Del Real, G. & Rousseau, M. (2004). Promoting academic literacy with technology: Successful laptop programs in K-12 schools. *System, 32*(4), 525-537.

World Education Forum (2000). Education for all: Meeting our collective commitments. April 26-28, Dakar, Senegal**.** Retrieved March 21, 2009 from http://www.unesco.org/education/efa/ed_for_all/dakfram_eng.shtml.

Wydra, E. (2001). The effectiveness of Selfcare Management Interactive Multimedia Module. *ONF*, 28(9), 1399-1407.

Yoon, H. (2009). More than a linguistic reference: The influence of corpus technology on L2 academic writing. Retrieved March 12, 2009 from http://llt.msu.edu/vol12num2,pdf.

Zapata, G. (2004). Second language instructors and CALL: A multidisciplinary research framework. *Computer Assisted Language Learning*, 17(3&4), 339-356.