TESL-EJ Teaching English as a Second or Foreign Language
The Electronic Journal for English as a Second Language

Teaching Reading through Computer-Assisted Language Learning

August 2013 – Volume 17, Number 2

Tariq Muhammad Bhatti
Iqra University, Karachi, Pakistan
<mtbhatti2004@yahoo.com>

Abstract

To study the role of reading in secondary schools and how it may be improved through computers, a year-long study was conducted to examine which of two methods of teaching reading skills, an instructor-led class vs. computer-assisted language learning (CALL), aided secondary students in improving the literal, inferential, and evaluative levels of reading skills. This experimental research study included two randomly selected groups of ninth-grade students of a public sector secondary school of District Khairpur Mir's, Sindh, Pakistan. Both groups received 24 reading lessons either through CALL or through an instructor-led method. Participants' reading skills were measured by pre- and post-tests by a panel of three examiners. A paired one-tailed t-test was used to analyze test scores. Results show that CALL was 35% more effective than the traditional instructor-led class. Although the study suggests that CALL provides a more conducive learning environment for teaching reading, it must be used effectively.

Keywords: CALL, teaching English as a foreign language, Reading instruction, Pakistan

Introduction

Reading skills have immense importance in students' success at school (Jarvis & Pastuszka, 2008). In addition, students who have a strong foundation in reading and receive encouragement at home can only excel in school (Yubune, Kanda, & Tabuchi, 2007). Lamy and Klarskov (2011) suggest that reading is the most important skill for children in secondary schools. Unfortunately, schools provide the chance of improving reading skills to a very little extent (Bangs, 2011); however, a recent study on the use of technology in language education found that this situation can be improved by using computers in secondary schools (Bax, 2011).

Computer-assisted Language Learning (CALL) in Language Learning

Computer-assisted Language Learning (CALL) involves applying computer hardware (Butler-Pascoe, 2011) and software (Busch, 2003) to a teaching-and learning environment (Chun, 2001). Several studies have shown that CALL has positive results on language learning (Chun, 2006; Chun, & Plass, 1997; Chun, & Scott, 2004; Cobb, &

Stevens, 1996; Davies, 1997; Davies, 2011; Davies, Bangs, Frisby & Walton, 2010, Davies & Hewer, 2011), especially on the learning of children in secondary schools (Almekhlafi, 2006). CALL provides individualized instruction (De Ridder, 2000), which matches with the student's level of interest (Dreyer, & Nel, 2003), understanding, and pace of learning (Davies, 2007; Figura et al., 2007; Paul, 2009; Poznan, 2001).

Supporters of CALL suggest that CALL has made language teaching progressive (Dudeney, 2007; Felix, 2003; Engler, Hosking, & Payne, 2008), adaptable (Gartner, 2007) and approachable (Gupta, & Schulze, 2011) to individual learning requirements with appropriate use of it (Grossmann, 2008).

Reading Skills Development in the Classroom

Reading comprehension drills have traditionally been misused (Heift & Schulze 2007; Hubbard, 2009; Hu, 2007) by both teachers and students. Teachers believe that grammar, composition, and speaking and listening skills are key elements of English instruction (Hui-Fang, 2005; Jacobs, & Gallo, 2002; Jarvis, & Pastuszka, 2008). On the other hand, learners consider reading comprehension tests time consuming (Jarvis, & Szymczyk, 2010), tiresome, and boring (Jarvis et al., 2008).

In addition, students find traditional methods of language learning non-interactive (Kessler, 2007; Lamy & Klarskov, 2011; Lan, Sung, & Chang, 2006; Leakey, 2011) and believe that the literature presented on computer is in varied forms (McEnery & Wilson, 2011), new, and presented more interestingly (Lie, & Chen, 2007). Computer language learning projects engage the students (Thomas, 2008; Thorne, & Payne, 2005; Tseng, 2008; Walker, Davies, & Hewer, 2011; Walz, 2001a) in a number of interesting and interactive activities meant to enhance reading skills (Yubune, Kanda, & Tabuchi, 2007).

Reading comprehension has remained a neglected language skill in secondary schools in South Asia because teachers teach reading without understanding (Liu, 2008). Moreover, students consider reading boring (Sanchez, 2007) and teachers think it is less important (Robin, 2007). On the contrary, computers have potential (McEnery, & Wilson, 201; Mejias, 2006) to address to these issues at secondary and higher secondary level (Little, 2007).

The purpose of this study was to examine the efficacy of CALL in teaching three levels of reading skills in public sector secondary schools of District Khairpur Mir's, Pakistan. The study involved two groups of ninth-grade students of the secondary schools where the researcher taught. The confidentiality of the participants' names, identity and other information was ensured by giving them pseudonyms and keeping all information confidential.

The study was guided by the following question: Is Computer-assisted Language Learning (CALL) more effective method of teaching reading skills at the secondary school?

Hypothesis

Teaching reading through CALL environment is more effective on the three levels of reading skills at secondary schools.

Sub-hypotheses:

1. Teaching reading through CALL is more effective at the literal level of reading skills.
2. Teaching reading through CALL is more effective at the inferential level of reading skills.
3. Teaching reading through CALL is more effective at the evaluative level of reading skills.

Methodology

An experimental design was used in this study. Participants included two groups of ninth-grade students, each comprised of 30 students. The experimental group (N=30) and the control group (N=30) were taught through CALL and through a traditional instructor-led class, respectively. Participants had no prior experience with computers.

Participants included ninth-grade males in the same age group (15-17 years of age) from the same secondary school during the 2010-2011 academic year. Twenty-four lessons on reading skills, with the help of the computers including images, sounds, graphs and animation, were offered to the treatment group. The same lessons (without images, sounds, graphs and animation) with simple texts were given to the controlled group in a traditional instructor-led class.

Furthermore, the lessons for the experimental group were especially designed by the researcher to include colorful pictures, sounds, graphs and other animations in a PowerPoint presentation. In contrast, lessons for the control group were adopted from the textbooks that did not have pictures, sounds, graphs, or any animation. It was ensured that the readability index of both texts remained nearly the same. For this purpose, various text materials were used and an average readability index was determined with the help of reading difficulty experts. However, students enrolled in this course were assumed to be similar to the public sector secondary schools' students of district Khairpur.

Research Design

The dependent variable in this study was the achievement scores of the control group and treatment groups. The independent variable of this study was the presence or absence of CALL instructional environment.

Data Collection

Data included 24 reading lessons, pre- and post-tests, and demographic questions. Lessons were given to the experimental group using computers without the intervention of a teacher. Moreover, the same and equal lesson plans (simple text only) were administrated through the instructor-led way with the intervention of a teacher. However, lessons for the experimental group included images, sounds, graphs and animation, which were excluded from the lessons of controlled group. In this regard, the readability index of the texts of both lesson plans was found to be nearly the same.

The researcher developed the pre-test and post-test with the required readability index set at ninth-grade level. The specification of the test was that there were five passages used in the pre- and post-tests, for which 16 items were used. Out of the 16 items, eight

items were on a literal level, five were on an inferential level, and three were on an evaluative level. Participants also filled out forms to provide data about their social status, use of computers at home, access to computers in school and their medium of instruction.

Procedures

Participants were informed of the purpose of this study. Those who submitted a consent form to the head master office were randomly assigned and selected to participate in either the control or the experimental groups. The pre-test was administered on the three levels of reading skills to measure participants' existing level of reading skills. The control group then received their lessons without the use of the computers that consisted of text only. The experimental group received the equally challenging lesson plans with the help of computers, including the images, sounds, graphs and animation. On completion of the tutorial, all subjects took a brief post-test on the three levels of reading skills.

Data Analysis

Results from the achievement scores were recorded as the difference of means, standard deviation, and standard error means. Means of standard deviation and arithmetic mean comparison tests were performed to evaluate the key differences in accomplishments of experimental group and control group' and also to determine if significant differences existed in achievements of the two groups. The pre- and post-tests were used for comparison of students' achievements. Classroom observation and interviews were also conducted to ensure reliability and validity. Achievement scores of both groups were analyzed using computer software. As positive results were assumed therefore, a one-tailed t-test was used. The null hypothesis was that there is no significant difference between the scores of the experimental group and the control group, whereas the alternative hypothesis stated that there is statistical difference between the post-test scores of both groups. Both groups were tested at the 0.05 level of confidence. The t-score was 2.02,

Table 1. Mean Scores

Group	Pre-test Mean	Pre-test S.D.	Post-test Mean	Post-test S.D.	Gain Score Mean
Experimental (n=30)	24.65	9.98	51.63	11.98	26.98
Control (n=30)	20.77	8.47	31.1	10.58	10.33

The df for this study was 58 (df= n1+n2-2, 30+30-2 = 58). At the 0.05 confidence level, the critical value of t =+1.664, and rejection rule for null hypotheses was that the null hypothesis would be rejected if the calculated value was greater than the critical value. The calculated value was greater than the critical value, which meant that null

hypothesis was rejected and the alternative hypothesis was accepted. Findings showed that both groups improved; however, the experimental group improved more than 35% than the control group. Therefore, it was concluded that the CALL environment was more efficient than the traditional instructor-led classes in developing three levels of reading skills at secondary level.

Table 2. Mean Gain Scores for Three Levels of Reading Skills

Reading Levels		***Pre-test Mean***	***Pre-test S.D.***	***Post-test Mean***	***Post-test S.D.***	***Gain Score Mean***	***Gain Score S.D.***
Literal Level	Experimental (n=30)	16.20	4.24	25.13	6.36	8.93	2.12
	Control (n=30)	14.30	4.28	16.55	4.98	2.25	0.70
Inferential Level	Experimental (n=30)	4.63	3.21	13.02	4.75	8.39	1.54
	Control (n=30)	4.30	2.28	6.28	2.61	1.98	0.33
Evaluative Level	Experimental (n=30)	3.82	4.03	14.2	2.68	10.38	-1.36
	Control (n=30)	2.50	3.19	8.27	4.20	5.77	1.01

Table 3. t for Three Levels and Total Scores

Reading Level	**t-scores**	
	Pre-test	**Post-test**
Literal Level	1.58	5.26
Inferential Level	0.36	6.63
Evaluative Level	1.46	6.49
Total scores	1.50	6.72

Discussion

CALL provided a self-paced and motivating language-learning environment in which the students worked with high level of interest at a faster pace. It was concluded that the use of computers can promote the effectiveness of reading material in terms of pronunciation, vocabulary, use of words in different contexts, and comprehension. The computers assisted those students in solving queries and improving self-confidence at the high pace of their learning, which in turn, improved their motivation level and enhanced the quality and quantity of their learning outcomes. However, the CALL

approach assisted students more in developing three levels of reading skills i.e., literal level, inferential level, and evaluative level. CALL still demands more efforts on the part of the teachers, especially in the selection and use of application software.

This study suggests that CALL can develop students' reading skills on three levels. Therefore, it is recommended that English teachers at all levels in Pakistan adopt CALL for teaching reading skills at three levels. However, applying CALL to the Pakistani context presents particular difficulties due to the socio-cultural and educational environment. There have been some ground-breaking uses of CALL, specifically related to the English as a Second Language context, which could be applied to schools in urban areas of Pakistan where the computers are readily available.

Pedagogical Implications

CALL can be used to teach reading skills. However, computers are not used for reading in most instructional contexts in Pakistan and many teachers believe that effective reading instruction should include memorization and the reproduction of decontextualized words and sentences. Teacher resource centers should be established for the professional development of language teachers at the district level. The use of CALL software should be promoted in the teachers' training programs without any discrimination between teachers of private or public sectors.

Training should also be provided to the teachers of all categories for the development of CALL software programs through the recognized institutes, like as Microsoft. CALL activities and materials should be included in the textbooks of all secondary levels. To maximize the potential of computers in schools, funds and technical support should be provided to the education sector.

Conclusion

CALL has showed positive results in improving the reading skills of students at secondary school. Using computers in reading instruction generated a lot of interest among the students for reading comprehension. In addition, students enjoyed the reading material with a variety of pictures and sounds. For this reason, teachers need to prepare PowerPoint presentations to generate more interest in learning among the students.

About the Author

Tariq Muhammad Bhatti is a professor at Iqra University, Karachi, Pakistan. He received his M.S. in Information Theory from Hamdard University, Karachi, and his B.S. in Computer Science from the University of Karachi.

References

Almekhlafi, A. G. (2006). The effect of Computer-assisted Language Learning (CALL) on United Arab Emirates English as foreign language (EFL) school students' achievement and attitude. *Journal of Interactive Learning Research, 46*, 308-320.

Bangs P. (2011) Introduction to CALL authoring programs. Module 2.5 in Davies G. (ed.) *Information and Communications Technology for Language Teachers (ICT4LT)*, Slough, Thames Valley University. Available: http://www.ict4lt.org/en/en_mod2-5.htm.

Barriere, C., & Duquette, L. (2002). Cognitive-based model for the development of a reading tool in FSL. *Computer-assisted Language Learning, 15*(5), 469-481.

Bax S. (2011) "Normalization revisited: the effective use of technology in language education", *International Journal of Computer-Assisted Language Learning and Teaching (IJCALLT) 1*(2), 1-15.

Blok, H., Oostdam, R., Otter, M., & Overmaat, M. (2002). Computer-assisted instruction in support of beginning reading instruction: A review. *Review of Educational Research, 72*(1), 101-130.

Brandl, K. (2002). Integrating Internet-based reading materials into the foreign language curriculum: From teacher- to student-centered approaches. *Language Learning & Technology, 6*(3), 87-107.

Butler-Pascoe M. E. (2011). The history of CALL: the intertwining paths of technology and second/foreign language teaching. *International Journal of Computer-Assisted Language Learning and Teaching, 1*(1),16-32.

Busch, H. J. (2003). Computer-based readers for intermediate foreign-language students. *Educational Media International, 40*(3/4), 277-285.

Chun, D. (2001). L2 reading on the Web: Strategies for accessing information in hypermedia. *Computer-Assisted Language Learning, 14*(5), 367-403.

Chun, D. M., & Plass, J. L. (1997). Research on text comprehension in multimedia environments. *Language Learning & Technology, 1*(1), 60-81.

Davies G. & Hewer S. (2011) Introduction to new technologies and how they can contribute to language learning and teaching. Module 1.1 in Davies G. (ed.) *Information and Communications Technology for Language Teachers (ICT4LT)*, Slough, Thames Valley University.

De Ridder, I. (2000) Are we conditioned to follow links? Highlights in CALL materials and their impact on the reading process. *Computer-assisted Language Learning, 13*(2), 183-195.

Dreyer, C., & Nel, C. (2003). *Teaching reading strategies and reading comprehension within a technology-enhanced learning environment. System, 31*(3), 349-365.

Gupta P. & Schulze M. (2011). Human Language Technologies (HLT). Module 3.5 in Davies G. (ed.) *Information and Communications Technology for Language Teachers (ICT4LT)*, Slough, Thames Valley University.
Available: http://www.ict4lt.org/en/en_mod3-5.htm.

Healey D. (1998) "Computers and language learning: an overview", *Language Teaching 31*, 57-71.

Hu, J. (2007). On the role of ICT in the teaching of college English reading in China. *Changing English, 14*(3), 343-347.

Hui-Fang, S. (2005). Email dialogue journaling: Attitudes and impact on l2 reading performance. *Educational Studies, 31*(2), 197-212.

Jacobs, G., & Gallo, P. (2002). Reading alone together: Enhancing extensive reading via student-student cooperation. *Reading Online, 5*(6). Available: http://www.readingonline.org/articles/art_index.asp?HREF=jacobs/index.html.

Jarvis, H. (2009). Computers in EAP: change, issues and challenges. *Modern English Teacher, 18*(2), 51-54.

Jarvis, H. and Szymczyk, M. (2010). Student views on learning grammar with web and book-based materials. *English Language Teaching Journal, 61*(1), 32-44.

Jarvis, H. (2009). Computers in EAP: change, issues and challenges. *Modern English Teacher. 18*(2), 51-54.

Kessler, G. (2007). Formal and informal CALL preparation and teacher attitudes toward technology. *CALL Journal, Taylor & Francis: Antwerp*.

Kumbruck, C. (1998). Hypertext reading: Novice vs. expert reading. *Journal of Research in Reading, 21*(2), 160-172.

Lan, Y., Sung, Y., & Chang, K. (2006). Collaborative early EFL reading among distributed learners: A simulation pilot study. *The JALT CALL Journal, 2*(2), 53-66.

Levine, A., Ferenz, O., & Reves, T. (2000). EFL academic reading and modern technology: How can we turn our students into independent critical readers? *TESL-EJ, 4*(4).

Lim, K., & Shen, Z. (2006). Integration of computers into an EFL reading classroom. *RECALL, 18*(2), 212-229.

Liou, H. C. (2000a). The electronic bilingual dictionary as a reading aid to EFL learners: Research findings and implications. *Computer-assisted Language Learning, 13*(4/5), 467-476.

Liu, G.-Z. & Chen, A.S.W. (2007). A taxonomy of Internet-based technologies integrated in language curricula. *British Journal of Educational Technology, 38*(5), 934–938.

Liu, G. -Z. (2008). Innovating research topics in learning technology: Where are the new blue oceans? *British Journal of Educational Technology, 39*(4), 738-747.

McEnery A., & Wilson A. (2011) Corpus linguistics. Module 3.4 in Davies G. (ed.) *Information and Communications Technology for Language Teachers (ICT4LT)*, Slough, Thames Valley University. Available: http://www.ict4lt.org/en/.

Murray, D. E., & McPherson, P. (2006). Scaffolding instruction for reading the Web. *Language Teaching Research, 10*(2), 131-156.

Petersen, S. (2006). Single-page, multiple-view web pages for reading ease. *The JALT CALL Journal, 2*(3), 53-61.

Rosell-Aguilar, F. (2007). Top of the Pods- In Search of a Podcasting "Pedagogy" for Language Learning. *Computer- Assisted Language Learning, 20*(5), 471-492.

Walker R., Davies G. & Hewer S. (2011) Introduction to the Internet. Module 1.5 in Davies G. (ed.) *Information and Communications Technology for Language Teachers (ICT4LT)*, Slough, Thames Valley University.
Available: http://www.ict4lt.org/en/en_mod1-5.htm.

Walz, J. (2001a). Reading hypertext: Lower level processes. *Canadian Modern Language Review/ La Revue canadienne des langues vivantes, 57*(3), 475-494.

Williams, H. S., & Williams, P. N. (2000). Integrating reading and computers: An approach to improve ESL students reading skills. *Reading Improvement, 37*(3), 98-100.

Yubune, E., & Kanda, A., & Tabuchi, R. (2007). Effects of different computer display methods of reading units on learners' reading efficiency. *Language Education & Technology, 44*, 215-228.

Appendix

Demographic Data Collection Form

Question	**Sindhi**	**Urdu**	**English**
• What is the medium of instruction of your class?			

Question	**Yes**	**No**
• Are you a computer literate?		

Question	**One year**	**Two years**	**More than two years**
• If yes then, for how many years have you been using computer?			

Question	**Yes**	**No**
• Do you know to operate MS Office?		

Question	**One year**	**Two years**	**More than two years**
• For how long are you using MS Office?			

Question	**Yes**	**No**
• Do you have your own computer?		

Question	**One hour in a day**	**Two hours in a day**	**More than two hours**
• If yes then, how much time do you use your computer for study purpose?			

Question	**Yes**	**No**
• Is there any computer laboratory in your school?		

Question	**Yes**	**No**
• Do you have access on school computers?		

Question	One class in a week	Two classes in a week	More than two classes in a week
• If yes then, how much time do you have access on school computers?			