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A Brief Review of Literature on Using Technology to Help Language Learners to Improve Their Language Skills

Eyup Bayram Guzel*
Institute of Education, University of Warwick, Coventry, UK

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People have been fairly interested in what technology offers to them around a scope of human necessities and it has become a part of human life. In this study, experimental studies were reviewed for the purpose of how technology helps language learners improve their phonemic awareness, reading comprehension and vocabulary development skills. As a conclusion, experimental studies demonstrated that students showed significant improvements up to 70% in phonological awareness, while they demonstrated up to 76% of improvements in reading comprehension and up to 77% in vocabulary development. The use of computer-assisted technologies and its positive outcomes were encouraged to be used more widely in order to meet the diverse needs of students.

Introduction

Over the last few decades, technology has become a part of human life. People have been fairly interested in what technology offers to them around a scope of human necessities .In order to meet these necessities and the challenges of fast-paced globalization and a more demanding high-tech environment of the future, it is necessary to educate and equip students with relevant abilities, especially in the process of improving communication skills and in literacy. Also, Ming-Mu (2008) states that it is important to assist them to advance authentic technology attitude and belief. In education, the technology is being used by many students, schools, colleges, and universities, and a lot of money has been spent for integrating the latest technological advancements into their subject areas (Calderon &Young, 1999). The language learning process is a long road and requires a great deal of language support and study. Therefore, in this strained process, several difficulties might occur such as phonemic awareness issues, reading, writing, comprehension, vocabulary development, listening, and speaking. Studies have consistently found that one of the biggest issues in language learning process stems from the issue of educating students with high phonemic awareness (Bryant & Hoswami, 1990, Leong, Tan, 2005). Another important difficulty of learning language is reading comprehension development. Burgoyne & Kelly (2009) stated that the absence of identifying comprehension difficulties and providing appropriate support for the development of comprehension will lead to reduced access to the curriculum and an inability to reach the individual's full potential. The difficulties of learning language have crucial and chaining effects on each other in terms of academic, quality of life, and functional performance. For example, a large body of research identifies phonological awareness as critical for the

* Eyupbguzel@gmail.com

development of word reading skills (e.g. Bryant, Maclean, Bradley, & Crosslands, 1990). Also, Hatcher and And (1994) documented the efficacy of phonics teaching in boosting reading skills. The primary purpose of reading is defined as to understand the text you read (Nation & Angell, 2006). Therefore, successful reading requires the development of comprehension skills and word reading (Oakhill, Cain, &Bryant, 2003). In this chain of phonemic awareness, reading and understanding (comprehension), if there is an absence of any of these components, the development of academic performance will be affected negatively and students might fail in order to reach their full potential. The difficulties would lead the teachers and researchers in the way of training themselves better. And, by doing so, as Calderon-Young (1999) assume, instructors will be able to implement new programs to boost the learning process in obtaining language. Calderon-Young, 1999 describes that "the presence of technological advances indicates that educators are interested in the benefit gained from the technology such as computers, LAN's, CD-ROM's, scanners, file servers, laserdiscs, computer peripherals, instructor-designed multimedia programs such as language tools, multimedia toolbooks, hypercard, and software program". The development process of technology is quicker than our educational institutions and Norman (1993) states that the critical issue to address is seeking the right path for the purpose of incorporating concern for learning into the functional specifications of the new devices. In order to integrate new technology into English language classes, according to Calderon and Young (1999), one of the most used technological items for educators has been the use of computers for practice, and some of software packages today contain problem solving and simulations, practice and drill, trivia games, videotape lessons, computer-assisted books and digitized images of foreign cities and countries accompanied by text in the target language. The three important components of English are studied in this article. The first one is phonemic awareness, which is described as an important metalinguistic skill which can let students more effectively acquire reading and spelling abilities (Mehta, Foorman, Branum, & Taylor, 2005). Rayner at al. (2001) describes reading comprehension as the level of understanding of books. The third one is vocabulary development, which is a set of words that the basic building blocks used in the generation and understanding of sentences (Miller, 1991). The purpose of this study is to provide a brief literature review on the benefits of using technology to help language learners to improve their phonemic awareness, reading comprehension and vocabulary skills. Implications and suggestions for future research will be provided.

Review of Selected Literature

Using technology to help language learners can be an important way in order to create independent and collaborative learning environments and also help students with language experiences as they move through the various stages of language acquisition (Rost, 2002). In this language acquisition process, there are several ways in which technology can be used by researchers. In this section, nine articles were reviewed for the purpose of using technology to help language learners improve their phonemic awareness, reading comprehension and vocabulary development skills.

Phonemic Awareness

The use of technology can be a very beneficial material in order to teach phonemic awareness in the process of language acquisition. Carreker (2005) emphasizes that phonemic awareness training is a helpful way to rectify the problems of poor spelling at any age while Treiman & Baron (1983) reports learners with high capability of phonemic awareness, perform better competences in pronunciation-recognition, spelling, and reading. For example

a number of research studies have shown the positive effects of using technology to help language learners containing ICT effectiveness (Felix, 2005), CALL (computer assisted language learning) as an academic research (Hubbard, 2005), developments in technology (Zhao, 2003).

In one study, Lai and Tsai (2009) studied with 120 third-graders, aged 9-10 years, from an elementary school in Yunlin County in Taiwan for the purpose of improving their English phonetic awareness by using multimedia English learning (MEL) system which is based on Hidden Markov Models (HMMs) to enhance their language skills. MEL system is designed for analyzing phonetic structures, identifying and capturing pronunciation errors. Then, the educators could provide appropriate advice in pronunciation, rhythm, volume and intonation based on students' needs. The researchers randomly assigned the students to a control and experimental group. The experimental group was taught by the MEL system while the control group was given conventional English teaching. The phonemic awareness test and the English achievement test were used for collecting data. The results demonstrated that the experimental group who had low phonemic awareness displayed significantly better scores than the control group in the English academic test.

In another study using technology to teach phonemic awareness, Flexer et al. 2002, conducted a study with 53 regular education students, 34 girls and 19 boys, from three city pre-school classrooms. The main purpose of this study was enhancing phonemic awareness of pre-school students by using sound field amplifications in classrooms. The Yopp-Singer test was conducted for all students to pretest measure. The Yopp-Singer test is a test phonemic segmentation that measures a child's ability to separately articulate the sounds of a spoken word in order and includes 22 items (Flexer at al., 2002). Then, the same test was administered at the end of first semester as a post-test measure. The researchers categorized students into three groups, group A, B and C and each group received different early phonological and phonemic awareness interventions. In group A, students were in the control group and given standard district pre-school and kindergarten curriculum. In group B (phonological awareness group) students received direct phonological awareness instruction 15 minutes every week four times starting the second semester of their pre-school year and continuing to the end of their first semester of their kindergarten year. Finally in group C, (phonological awareness group), students received the same instruction that group B students had and additionally received classroom sound-field system daily where the teachers wore wireless microphone transmitters, and their speech was transmitted by using light waves to an amplifier connected by wires to four loudspeakers to create a clear sound in the classroom. As a result, both groups B and C showed significantly higher scores than the control group (group A) on the posttest. Also, differences between group B and group C were not statistically different than each other because of the small group size of students, however, group C students received extra sound-field instruction than group B student, 78% of students scored above the mean for the test, while 57% percent of group B students scored above the mean. The results suggested that phonological and phonemic awareness training was more effective when sound field amplifications were used.

Finally, Chera and Wood (2003) studied the effectiveness of using computer-based reading materials to improve phonological awareness skills of young children who were beginning to read. Seventy-five students ranging from 3-6 years old were enrolled in this study and 15 students were put in a control group. Sixty students were given an access to the computer software program while the control group was not. This software included six animated multimedia talking books taken from UK (United Kingdom) phonic reading scheme Bangers and Mash. Pre-test and post-test were administered and the results were assessed according to

British ability scales word reading test (Elliot, 1983), Auditory onset awareness (Wilson, 1993) and Verbal onset awareness (Wilson, 1993). As a result, student in the intervention group demonstrated significantly higher scores in phonological awareness (70%) than the control group (45%) did between pre-test and post-test scores.

Reading Comprehension

Reading comprehension has of crucial importance in the academic learning of all subject areas, and is essential to professional success and to lifelong learning (Pritchard et al., 1999). Furthermore, Durkin (1993) describes reading comprehension as "essence of reading". In this crucial learning process, use of technology might be useful in expanding the opportunities for students in engaging in reading of text (Meyer & Rose, 1998).

In a study done by Lange at al., (1999) enhancing reading strategies through the use of technology in order to improve reading comprehension was studied. Seven hundred fourth grade students (group A) and 457 seventh grade students (group B) participated in this study. The researchers were evidenced declining of reading scores of students in data gathered by Illinois State University, Illinois State Board of Education and teacher observational checklists. The intervention used in this article were the incorporation of appropriate software programs including power point presentations, the software Inspiration for outlining content from reading subject areas, software on CD-ROM's were Reading Blaster, Critical Concepts and Decisions- The Environment for enhancing reading for meaning, finding details and comprehension and Venn diagrams for visualizing comprehensions of two or more concepts. The researchers conducted pre and post-standardized tests (the school district's criterion test) to both group. As a result, group A students showed 11% in overall reading comprehension skills and group B displayed 40% increase in reading comprehension. The researchers concluded that the use of technological tools improved students' reading comprehension and also provided skills to transfer these developments to other areas of their studies.

In another study, Ray and Belden (2007) evaluated strategies provided by an artificially intelligent adaptive tutoring and testing software system designed to teach reading comprehension skills to college students. Twenty-four college students enrolled in this study and they were evaluated according to pre and post-test which were specially constructed SAT/GRE type reading comprehension tests. Two equivalent forms (A and B) of reading comprehension tests were implemented for the purpose of exposing students to different content on pretest and posttests. The software system called MediaMatrix offers internet delivery of relatively traditional textbook content using highly individualized and adaptive tutorial and assessment procedures (Ray & Belden, 2007) were used including video based lectures with pauses to highlight via lecture, commentaries and question/answers, online textbook reading. Also, the use of settings, and other relevant variables was designated by an A/N process developed to parallel the process implemented within MediaMatrix for improving reading text comprehension (Ray, 2000). As a result of this study, a statistically significant (17%) gain between pre-to-post reading comprehension scores was found and the importance of using MediaMatrix strategies for shaping and improving students reading comprehension skills discussed by the researchers.

In Vince Gaudio's study (in 2003), an intensive vocabulary- building program for improving reading skills of ESL (English as a second language) students was implemented. Nineteen ESL students ranging from 7-10 years old in Illinois were enrolled for this study. The poor reading ability of students were documented by using the Star Computer Adaptive Reading Test. The vocabulary-building program used during the intervention included computerized

vocabulary programs (95 vocabulary words recorded on CD accompanied with photos, mini picture dictionaries), vocabulary software (Rosetta Stone), and vocabulary based games (modern curriculum press picture vocabulary cards). For analyzing results, pretest and post-test measures were used based on the Star Computer Adaptive Reading Test, which was conducted during the first week (pre) and at the last (post) week of this study. As a conclusion, 76% of students demonstrated an increase in their reading abilities and the greatest improvement was from those who scored lowest on the pretest.

Vocabulary Development

According to Pearson et al., 2007, we can decrease the academic gap of students' when we actively and systematically teach vocabulary. One of the ways to do so might be use of technology as Green (2005) establishes that technology can play an integral part in improving students' language learning abilities and in providing additional language learning opportunities beyond normal classroom environment.

In one study, Yeh and Wang (2003) investigated the effectiveness of three types of vocabulary annotations which are text annotation only, text plus picture and text plus picture and sound on vocabulary learning for 82 ESL (English as a second language) college students who had already completed 6 years of formal English instruction at secondary education level in Taiwan. The students were randomly assigned to use one of these three versions then they were given a pretest focused on some of the new vocabularies that they will see during the intervention. After that, the researchers conducted a posttest to evaluate the results. The results have been found that a text plus picture annotation was the most effective for vocabulary learning and the students' visual tendencies were stronger than their auditory tendencies.

In another study, Coll (2002) studied the benefits of a hypermedia-enhanced learning environment for English for Specific Purposes (ESP) students. "The hypermedia-enhanced learning environment provides a rich environment where learners gain exposure to foreign language texts by listening and reading in the target language" (Coll, 2002). Forty students (18 males and 22 females) participated. All of the students had a lower intermediate level proficiency in English, which was the target language in this study. Chemistry-related videos (The World of Chemistry), comprehension tools (HyperCard), video lessons and selected demonstrations and animations were used to teach vocabulary development in the Chemistry field. Students were randomly assigned to a control group and an experimental group and were given a vocabulary achievement pretest and posttest. For assessment, a technical and subtechnical vocabulary achievement test based on the material covered in the hypermedia-enhanced lessons was developed and conducted. As a result, the hypermedia-learning environment provided experimental subjects with exposure to new vocabularies to the students who were in experimental group and they accomplished a greater improvement in terms of overall vocabulary achievement test than those in the control group.

Horst, Cobb and Nicolae (2005) investigated a set of existing and purpose-built-online tools in their experimental study for vocabulary learning. The participants were university ESL (English as a second language) students at Canada. A total of 33 students, 14 of the students spoke Asian languages, 12 spoke Romance language background (Spanish, France, or Portuguese) and 7 spoke Arabic, Farsi, and Russian. All the students were intermediate-level English learners. The technological resources used were cloze-builder, concordance, hypertext, and a database with interactive self-quizzing feature. Coxhead's (2000) Academic Word List was used as targeted vocabulary learning. The participants were given specific

reading passages and enter the words into the Word Bank as test targets on a pretest. Then, posttest was conducted to compare the students' entry words into the Word Bank for comparison purposes. For assessment, a survey focused how often the students used each technological tool and their answers were categorized. The results were concluded that vocabulary knowledge of the participants increased substantially from 39% (pretest) to 77% (posttest) in terms of entered and un-entered vocabularies into the Word Bank program.

Summary of Selected Literature

In summary, the selected literature has shown that phonemic awareness (Lai, et al., 2009; , Carol & Kate et al ., 2002;, Chera &Wood, 2003), reading comprehension (Lange et al., (1999), Ray and Belden (2007) Vince Gaudio (2003)), and vocabulary development (Yeh and Wang 2003, Coll 2002, Cobb and Nicolae 2005)) are effective when combined with technology and implemented in teaching language to language learners.

Implications for Practice

The reviewed articles demonstrated that English language learners may significantly improve their language skills when technology is implemented in their native language learning process. In the study of Lai et al. (2009), using multimedia English learning system (MEL), in the study done by Chera and Wood (2003), using the software included six animated multimedia talking books, in the study of Ray and Belden (2007), using MediaMatrix system and In Vince Gaudio's study in 2003, using the vocabulary building program included computerized vocabulary programs (95 vocabulary words recorded on CD accompanied with photos, mini picture dictionaries), vocabulary software (Rosetta Stone) and vocabulary based games (modern curriculum press picture vocabulary cards) have proved that using technology to teach phonemic awareness, developing reading comprehension and enhancing vocabulary development is an effective way in the language learning process of language learners.

An additional implication for practice in the process of language learning is that students who are exposed to technology may use technological strategies that they learned in their other learning areas such as math, geometry, geography, biology and the list goes on. In the study done by Coll 2002, Chemistry-related videos (The World of Chemistry), comprehension tools (HyperCard), video lessons and selected demonstrations and animations were used to teach vocabulary development in chemistry field.

Recommendation for Future Research

Future research should examine computer based interventions in a more controlled environment (Ray and Belden, 2007). Next, Lange et al., (1999) recommended that the school administrations must be sure that the teachers are familiar and educated in terms of using technological software systems and should have a plan for integrating them into the content areas. In the study done by Horst, Cobb and Nicolae (2005) recommended that the researchers should investigate better developed vocabulary tests to assess the gains of students. They claim that there is not a well-developed vocabulary development assessment test for advanced level English learners.

Conclusion

In conclusion, the purpose of this paper was to provide a brief review of literature on the benefits of using technology to help language learners to improve their phonemic awareness, reading comprehension and vocabulary skills, review the implications for practice and provide recommendations for future research. In the studies reviewed, the researchers concluded that using technology to help language learners to improve their language skills is an effective way according to their results from experimental studies. These experiments in this study concluded that students showed significant improvements up to 70% in phonological awareness, while they demonstrated up to 76% of improvements in reading comprehension and up to 77% in vocabulary development. The use of computer-assisted technologies and its positive outcomes were encouraged to be used more widely by researchers and teachers by combining it to the curriculum in order to meet the diverse needs of students.

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