

Integration of Technology into Language Teaching: A Comparative Review Study

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Abstract—The purpose of this study was to monitor the effectiveness of earlier and contemporary practices in the application of information and communication technologies (ICTs) in language learning/teaching. It was revealed that current literature on the effectiveness of technology uses in language education is very narrow and there are three aspects that stand out: (1) The number of well-structured and comprehensive studies about the effects of technology uses on language education was very diminutive, (2) the settings where the studies were handled were restricted to higher education, (3) the experiments were often short-term and they mostly focused on only one or two aspects of language learning (e.g., vocabulary acquisition). However, the existing studies based mostly on experimental data showed a pattern of positive effects when compared to the conventional methods of language instruction. In terms of differences between the research done outside and in Turkey, the theme that was studied in international literature was based on technology use for providing opportunities for communication while in Turkey the studies concentrated on providing access to materials.

Index Terms—information and communication technologies (ICTs), language education, Computer Assisted Language Learning (CALL)

I. INTRODUCTION

Today, nobody can claim that a language class that does not use some forms of technology serves for effective language learning/teaching. Recently, starting from kindergarten and reaching to higher education, technology has been used both to support and to enhance language education. Therefore, current language education policies show tendency toward utilizing different forms of technology to support instructional processes, to involve language learners in the learning process, and to provide authentic patterns of the target culture and different cultures as well. Furthermore, some forms of technological tools permit teachers to differentiate instruction (Tomlinson, 2001) and adapt classroom activities and homework assignments according to different needs and expectations of the language learners to be able to foster language learning experience. In sum, technology continues to grow in importance as a tool to assist instruction of foreign languages in facilitating and mediating language learning for the students.

Technology plays a supplementary role, which is determined and shaped by the human dimension, namely, students and teachers. It is an undeniable fact that integration of old and new ways of learning within a comprehensive way is highly crucial to be able to adequately meet the students' needs and expectations. For this purpose, technology provides various authentic sources for teaching four skills of language (reading, listening, writing, and speaking); thus, the use of technology in language instructions has become vital in contemporary language education.

Through this study, it was aimed to seek for the effect of technology use on language instruction. To be able to pursue the quest for this claim, the following part will provide a historical perspective about the evolution of technology use in language teaching together with foremost attempts for integrating technology into the classrooms in Turkey. After that, a theoretical framework will be outlined to make the discussion more clear by mentioning about some important functions that are important for the use of technology in language teaching such as providing access to materials, providing communication opportunities, and fostering motivation. Later on, research conducted both abroad and Turkey will be given in detail to support the outlined theories. At the end, future directions for research on integration of technology into language instruction will be presented following the conclusion part in which a comparison between research in other countries and in Turkey will be offered.

II. A BRIEF HISTORY OF INSTRUCTIONAL TECHNOLOGY IN LANGUAGE TEACHING

There have been two major phases in technology supporting language instructions: audio media and visual media.

Audio materials are accepted as the first examples of technology used in language teaching. First of all, audiotape has a history dating back to the late 1950s. The first audiotape machines were bulky and heavy, yet it only became a universal medium with the emergence of audiocassette in the 1970s which created a great effect for the enhancement of language teaching. The common use of audio after 1970s resulted in the establishment of the audio language laboratories and this allowed both teachers and students to control the access to audio materials. After that, new forms of digital audio, called as the audio compact disc or CD, was introduced in the early 1980s and quickly caught on. Most importantly, a final type of digital audio was computer-based digital audio in 1980s.

In short, evolution of the use of audio media in English instruction has provided interactive and extensive use of authentic listening materials and thus it is still widely used in language classrooms. As listening is one of the crucial phases in language learning, the creation of audio media can be accepted as a milestone in integrating technology into the language instruction. That is to say, what is needed principally at the beginnings of language learning is considerable amount of comprehensible input (especially through reading and listening) that might help learners progressively construct their knowledge of the language system according to Krashen's (1985) input theory. On the other hand, an all-encompassing listening activities allow students to listen to materials that contain familiar items might be useful in making the connection between reading and listening. Therefore, use of audio technology should be used interactively via computers and projection machines to support them with visual media and it also enables the students to follow up reading passages with the audio recorded by native speakers of target language. Today, textbooks supplies extensive interactive audio materials (CDs) to teachers and students by promoting learning new vocabulary items and diverse number of cultural elements together with authentic knowledge about target language. Moreover, cellular phones and Mp3 players are widely used as supplementary listening technologies and also enable the learners to do listening activities wherever they are.

Images and videos are main constituents of visual media often used effectively in language teaching. One of the most common visual media now used are photographic motionless frames, either in the form of slides or frames on a videodisc or CD ROM. Slide projector and overhead projector were special forms of device to use these still frames dating from the 1960s, yet they have become a simple technology to use. Although they had advantages for a particular time period, including relative simplicity in its technology, they are in the process of becoming outdated technologies nowadays. Slides can now be created on *computer media* which gives the teacher the advantage of using high-quality images and organizing the slides in different ways for different groups of students.

Motion video and TV were also used widely for a particular time period beginning from 1960s. They are still used by teachers when necessary in classrooms, but instead of separate devices, computers include the technology to use all of them at the same time. Especially after the internet use in educational contexts became so common together with computers, the combined versions of technology has emerged with the help of internet and computers and teachers and students have started to create very comprehensive instruction based on instructional technologies.

It is important to highlight that widespread use of visual media is based upon computers. Especially for visual media, computers have been used for language teaching since the 1960s (Seferoğlu, 2005). The integration of computers into language teaching caused the emergence of a new term called as *Computer Assisted Language Learning (CALL)*. We can divide this 50-year-history into three main phases: behaviorist CALL, communicative CALL, and integrative CALL (see Table 1). Each stage corresponds to a certain level of technology as well as a certain pedagogical approach (Warschauer, 2004).

As Warschauer (2004) indicated, behaviorist CALL was used for instructional purposes in the 1960s and 1970s. He added that parallel with the behaviorist learning, this kind of CALL typically utilize repetitive language drills, namely *drill-and-practice* (Warschauer, 2004). Warschauer (2004) also pointed out that this paradigm is especially popular in the United States and accordingly the computer is thought as an automated instructor that never approaches judgmental and allows students to study any kind of subjects individually.

The next phase, communicative CALL, emerged in the early 1980s, just after that behaviorist approaches to language teaching were about to be refused at both from the theoretical and instructional perspective, and when newly released personal computers (PCs) started to create diverse opportunities for individual study (Warschauer, 2004). Advocates of communicative CALL laid emphasis on the fact that rather than directly teaching the forms of language, computer-assisted instruction should put more emphasis on how to use forms, allow and encourage students to produce original utterances rather than just try to communicate using predetermined language structures, and assist the students at using the target language effectively for communicative purposes based on skills like speaking and writing (Jones & Fortescue, 1987). Through communicative CALL, the focus was both on what students do by means of technological device and also on how students interact with each other or computer while studying.

Despite the fact that communicative CALL was accepted as an evolved form of behavioristic CALL, it started to receive some crucial criticisms with regard to satisfying the changing needs in language learning. Communicative language teaching (CLT) theory, generated by Council of Europe as a reaction to the changing needs of language teaching after the removal of the boundaries in Europe in 1960s, was so bound to the computer use in language teaching that according to Warschauer and Healey (1998) this necessitated a greater reconsideration of communicative language teaching theory and practice. Many teachers were turning from a cognitive view of communicative teaching to a more interaction-based view, which put superior emphasis on the use of language use in authentic social contexts (Warschauer & Healey, 1998). Task-based, project-based, and content-based approaches all aimed to engage learners into authentic environments via utilizing several skills of language learning and use. This conduced toward a new viewpoint on technology and language learning, which has been called "integrative CALL" (Warschauer, 1996). He prescribed that According to this approach, the learners acquire how to use different technological tools within the normal process of language learning, rather than visiting the computer lab on a once a week basis as different exercises (Warschauer, 1996).

Nowadays Information and Communications Technology (ICT) are used as an alternative term for CALL. The term includes technologies in which the computer plays a central role, i.e. Computer Assisted Language Learning (CALL), the Internet, and a variety of common computer applications. Moreover, Cloud, Twitter, Facebook, webquests, games, mobile devices (tablets and smart phones) stand out as the newest ICTs that are used for learning/teaching a language.

TABLE 1.
STAGES OF COMPUTER ASSISTED LANGUAGE LEARNING (CALL) (WARSCHAUER, 1996)

Stage	1970s-1980s: Structural/behavioristic CALL	1980s-1990s: Communicative CALL	21st Century: Integrative CALL
Technology	Mainframe	PCs	Multimedia and Internet
English-Teaching Paradigm	Grammar-Translation & Audio-Lingual	Communicative Language Teaching	Content-Based, ESP/EAP
View of Language	Structural (a formal structural system)	Cognitive (a mentally-constructed system)	Socio-cognitive (developed in social interaction)
Principal Use of Computers	Drill and Practice	Communicative Exercises	Authentic Discourse

III. METHODOLOGY

In essence, it is an undeniable fact that technology use in language can constitute all kinds of instructional theories. For instance, it can include behaviorist perspective making use of reinforcements, or it can work cognitive theories since meaningful learning and enhancement of information processing are very important by means of audio-visual reinforcements. In addition to that, it is obvious that integration of technology into language teaching is parallel to Gardner's multiple intelligence (MI) theory because it gives the teachers an opportunity to touch upon students' different learning styles. Moreover, as mastery learning is another crucial issue in language teaching, task-based instructional strategies are widely used in technology assisted language instruction. Lastly, integration of technology into language teaching has a humanistic pattern because of the fact that it provides the students with freedom of choice, help them take their responsibility of learning, and give a chance for self-actualization.

Focusing on the issues of effectiveness, this review presents a meta-analysis of the specific applications of technology assisted language teaching that have been studied recently. The study is handled within three highlighted functions of technology use in language teaching that are present in international literature: access to materials, communication opportunities, and motivation.

Having access to engaging, authentic, and comprehensible materials (especially for listening and reading) in the target language is indispensable for successful language learning. However, whether in class or out of class settings, such accesses are often limited for many language learners. Therefore, this restriction is supposed to be wiped out with the help of information and communication technologies. According to Zhao (2003), there are three principles of information and communication technology (ICT) to provide better access to linguistic and cultural materials can be explained in three subheadings: improving access efficiency through digital multimedia technologies, increasing authenticity using video and the internet, augmenting comprehensibility through learner control and multimedia.

Secondly, engagement of learners into authentic communication (interaction) in the target language is another essential precondition for successful language learning; but most learners do not coincide with such chances of access. ICTs have started to be used in many different ways to provide language learners with opportunities for interacting in the target language (Hanson-Smith, 2001). Typically, there are two groups of rationale to use ICTs: interaction with the computer and interaction through the computer with remote audiences (Zhao, 2003).

Lastly, learner motivation is another aspect through which language teaching becomes more affective. Therefore, as information and communication technologies are essential parts of language teaching today, whether they foster learner motivation is another issue open to discussion. Among the benefits of instructional technologies in language teaching for motivation, we can list enhancement of motivation and involvement, fostering autonomy – making them more responsible and active, increasing satisfaction, and providing better quality of learning. In the following part, current research issues will be depicted as parallel with the theoretical framework that was drawn above.

Selection of Studies

Firstly, to study the applications about the effectiveness of information and communication technologies on language instruction, some important research studies from international literature were compiled up. To achieve this objective, citation analysis was used to investigate documents related to CALL that are indexed by databases such as EBSCOhost, ScienceDirect, and Google Scholar. "Computer-assisted language learning," "computer-assisted language instruction," "computer-aided language learning," "CALL," "technology-assisted language learning," etc. were the keywords used in searching for documents. In order to compare the international literature with the literature in Turkey, citation analysis was employed to investigate documents related to the use of information and communication technologies on language instruction in Turkey that are indexed by the EBSCO Host, ScienceDirect, ULAKBIM (Turkish Academic Network and Information Center), YOK Thesis Database, and Google Scholar. "Computer-assisted language learning in Turkey," "computer-assisted language instruction in Turkey," "computer-aided language learning in Turkey," "CALL in Turkey," "technology-assisted language learning in Turkey," were the keywords used in searching for documents.

In international literature, there were a total of 29 research studies analyzed that were judged to be relevant to the field of computer-assisted language learning between the years of 1996-2014. The studies were mostly in experimental design, but there were a few survey design studies as well. 10 of the studies were related to the use of technology in providing access to language learning materials (see Appendix 1), 13 of them were related to creating environment for interaction (see Appendix 2), and 6 of them were related to fostering motivation through instructional technologies (see Appendix 3). All of the studies were research articles published in international journals.

In Turkey, there were a total of 21 documents analyzed that were judged to be relevant to the field of computer-assisted language learning between the years of 2005-2013. Most of the studies were conducted in experimental design. Among these 21 studies, 12 of them were related to use of technology for providing access to language learning materials (see Appendix 4), 5 of them were related to the use of technology for providing interaction (see Appendix 5), and lastly 4 of them were interrelated with the use of technology for fostering learner autonomy in language learning (see Appendix 6).

Among these 21 studies, 4 of them were master's thesis and 1 of them was a doctoral thesis study. On the other hand, 14 of the studies were articles published in peer-reviewed national and international journals. Moreover, 2 of them were articles presented at international conferences.

IV. RESULTS

Regarding effectiveness of technology on language learning in general sense, it might be declared technology-based language teaching can be more effective than traditional language instruction considering both Turkish context and studies outside Turkey. In spite of the fact that the number of existing experimental studies is inadequate, a reliable pattern of positive effects can be observed across the studies. However, this finding should be rendered very carefully because of some particular limitations.

First of all, most of the studies had generally small sample sizes and rarely made use of random sampling. Secondly, it was obvious that all studies were conducted on college students and adult learners. This evidence raises questions about the issues of generalizability of the findings to other language learners who may vary in terms of motivation, language background, learning style, and lastly instructional context. For instance, it is expected that college students are mostly more motivated and more competent learners than K-12 students as a whole (Zhao, 2003). Lastly, in most of the studies, the researchers of these studies were also the instructors who designed, implemented, and evaluated the technology-assisted language instruction.

There was no study that showed a comprehensive approach to prove the effectiveness of application and integration of technologies on language instruction. However, it is worthy to mention that commercially available language software or tools were widely used in these studies such as smart phones and software like Whatsapp.

In terms of differences between the research done outside and in Turkey, the theme that was studied in international literature was based on technology use for providing opportunities for communication while in Turkey the studies concentrated on providing access to materials. This is an indication of the fact that researchers in international area focus on the productive skills in language learning like speaking and writing while in Turkey, researchers attempt to integrate technology into language instruction to support basic two skills in language: reading (vocabulary acquisition) and listening. This may also indicate that language teaching in Turkey is not as successful as it is abroad.

V. FUTURE DIRECTIONS

Developments in technology need to be transmitted into pedagogical area and carefully considered in the forms of curriculum and content for language teaching. It is a fact that the effectiveness of technology on language learning is highly related to how it is used. Some particular technologies are more suitable than others for certain learning tasks for certain learners. Thus, Salaberry (2001) suggests that studies about applicable ways and contexts of technology use are much needed.

In the context of Turkey, technology is underutilized in classrooms and research mostly focuses on university students. This finding raises two concerns: how to support technology use in K-12 classrooms and how to encourage more research about technology use in K-12 language classes in Turkey.

Moreover, there is an obvious lack of systematic evaluation attempts to interpret the effectiveness of large scale comprehensive uses of technology to support language learning. Therefore, research is expected to be more process-oriented in which emphasis is put on understanding how students learn instead of what and how much they learn.

APPENDIX 1

INTERNATIONAL RESEARCH ON PROVIDING ACCESS TO MATERIALS

RESEARCHER	TOOL	METHOD	EFFECT
Bhatti(2013)	e-books (computer)	Two groups received 24 reading lessons either through CALL or through an instructor-led method. Reading skills were measured by pre- and post-tests and a paired one-tailed t-test was used to analyze test scores.	CALL was 35% more effective than the traditional instructor-led class
Gobel and Kano (2013)	reading while listening(RWL) program	The students in the program (N = 230) practiced RWL and took progress tests using a Moodle module (modular object-oriented dynamic learning environment) that also kept records of their progress (MoodleReader). Student gains in reading rate, vocabulary recognition, and general English proficiency was measured by a test and questionnaire.	RWL had a significant effect on reading rate and vocabulary recognition, but not for general English proficiency.
Green and Youngs (2000)	Activities on the internet	Researcher substituted regular classroom instruction with web activities one class period per week for beginning college French and German students for a full semester	1-Treatment group learnt language at a rate similar to that of their peers in the control groups. 2- the students had a positive experience using the web.
Herron (2000)	Authentic video(for French learners)	One class watched authentic videos in French while the other class followed the regular curriculum without the video.	video helped their first-year college French learners develop significantly better understanding of the target culture
Green and Youngs (2000)	Activities on the internet	Substituted regular classroom instruction with web activities one class period per week for beginning college French and German students for a full semester	1-Treatment group learnt language at a rate similar to that of their peers in the control groups. 2- the students had a positive experience using the web.
Weyers (1999)	Authentic video(for Spanish learners)	One class watched a Mexican television show that met 60 minutes daily for a total of 8 weeks, while the other class followed the regular curriculum without the video.	1-the video group's performance on both listening comprehension and oral production to be significantly better than the regular group 2- The video group also outperformed their counterparts on other measures of communicative competence
Nutta (1998)	Computer software	Compared instruction from the teacher versus using a multimedia computer program (audio, video, recording capabilities etc.) on tenses in English	The ESL students using the computer program performed as well or significantly better than their counterparts attending the class.
Sheng-Shiang, Hui-Chin, and Shih-hsien (2013)	online annotations	Four types of online annotations:(1) marking vocabulary, (2) adding Chinese explanatory notes to unknown vocabulary, (3) marking text information, and (4) adding summary notes to each paragraph	Marking vocabulary and adding Chinese explanatory notes facilitated recognition and meaning of unknown vocabulary.
Al-Seghayer (2001)	a video clip in combination with a text definition	Vocabulary teaching A video clip+text definition Vs. a picture in combination with a text definition	Video clip in combination with a text definition is more effective in teaching unknown vocabulary than a picture in combination with a text definition.

APPENDIX 2

INTERNATIONAL RESEARCH ON PROVIDING OPPORTUNITIES FOR COMMUNICATION

RESEARCHER	TOOL	METHOD	EFFECT
Ibanez et al. (2011)	3D multi-user virtual environment	12 non-native Spanish speakers were provided with natural text chatting with non-player characters, textual tagging of virtual objects, automatic reading of texts in learning sequences and the orchestration of learning activities to foster collaboration	The need for scaffolding was observed. In terms of communication, 3D audio provided a strong feeling of immersion
Alm (2009)	internet blog(German language)	1-The students(N=20) kept a reflective journal and were given the choice of using a blog or an exercise book, 2-writing tasks, including discussing current affairs, completing grammar exercises and podcast reports 3- completed self-reflections on their German skills at the beginning and end of the course	1-Most of the students chose to use a blog for their journals and enjoyed the convenience it provided. 2- The students who chose to share their blogs liked the ability to exchange ideas with their classmates.
Noytim (2010)	Weblogs	Weblogs' role in enhancing EFL students' English language learning in the context of a university in Thailand	Weblogs fostered students' analytical and critical thinking skills.
Oskoz (2009)	synchronous computer mediated communication (SCMC)	SCMC interactions among intermediate Spanish learners to understand the extent to which learners in SCMC engage in patterns of collaboration similar to those used in F2F.	Learners created their own agenda and focused their attention on the language features that interested them the most rather than their teachers' instructional goals.
Meskill and Anthony (2005)	CMC tools	Experimental The relationship between CMC and foreign language learning.	1-the instructional opportunities afforded by electronic communications make CMC an excellent tool to complement live foreign language classes 2-Furthermore, feedback was smoothly integrated into the flow of conversation and students were able to correct their mistakes immediately.
Van Deusen-Scholl, Frei, and Dixon (2005)	CMC 1.0 tools	Experimental Examined the relationship between in-class, online, and out-of-class learning	Learners became part of a community of practice outside the classroom and took on social and communicative roles that are quite different from those inside the classroom.
Lin, Lee and Chen (2004)	Online discussion board in Chinese language arts instruction	Experimental Discussing on a web forum for a total of 12 sessions	1- ICT usage has, to a great extent, facilitated the writing skill development. 2-Online discussion board enabled students to communicate with writers and get quick feedback on their writings.
Chen, Belkada and Okamoto (2004)	Web-based listening environment	Experimental study in order to investigate whether different forms of interactivity affect language acquisition in the Web-based listening environment.	Web-based course helped maximizing students' language learning experiences and enhance their language abilities in English.
Abrams (2003)	synchronous computer mediated communication (SCMC)	Investigated the effectiveness of CMC on oral performance through a quasi-experimental study (96 students taking intermediate German at university level)	Students who were exposed to synchronous CMC outperformed the students in the face-to-face group.
Young (2003)	CMC	Mixed methods research methodology 29 students in a Taiwan high school)	The study revealed that the integration of ICT into second language education helped students improve their communication and problem-solving skills through online activities.
Harless et al. (1999)	a virtual conversation program in Arabic at the Defense Language Institute	Experimental The students interacted with these virtual characters for at least 8 hours per day for 4 days.	The participants' reading and speaking skills increased significantly while their listening skill increased convincingly.
Holland (1999)	speech-enabled interactive microworld program	The program allowed the learners of Arabic to construct objects by speaking to the computer	It improved student motivation and oral output.

APPENDIX 3

INTERNATIONAL RESEARCH ON FOSTERING LEARNER MOTIVATION

RESEARCHER	TOOL	METHOD	EFFECT
Elsner (2013)	computer-based multilingual storybooks	Experimental European Comenius project of MuViT (Multiliteracy Virtual) The participants were 69 fourth grade pupils from four primary schools in Frankfurt, Germany and Istanbul, Turkey. Pupils were observed (code-switching, solving tasks, self-explaining) while working with the software in class.	The findings indicated that the MuViT tools made a significant contribution to multilingual and media education in school.
Plana et al.(2013)	instant short messages via WhatsApp	Experimental 95 B2 level university students in Spain. Reading texts and activities about the texts were sent to the participants via <i>WhatsApp</i> . For ease of delivery, the texts and comprehension questions were administered through SurveyMonkey Initial Questionnaire(reading habits) A Final Survey(satisfaction)	90.63% of the respondents acknowledged that their participation in the project increased their motivation to read in English.
Huang(2013)	online extensive reading (e-book)	Experimental 81 university students in Taiwan read at least one online e-book weekly and turned in reading logs on an online reading forum.	E-book reading had a positive effect on students' motivations in terms of several dimensions: reading efficacy, challenge, curiosity, involvement, reading for grades, and integrative ambition.
Kim(2012)	SCMC	How synchronous computer-mediated communication (SCMC) and face-to-face (F2F) oral interaction influence the way in which learners collaborate in language learning and how they solve their communicative problems.	The use of collaborative processes to construct utterances was more predominant in face-to-face interaction than in SCMC.
Agarwal and Karahanna (2000)	WEB	A researcher-designed survey on cognitive absorption: the state of flow and cognitive engagement(N=288)	The findings supported their hypothesis that cognitive absorption supported by technology motivates students to use technology and as a result to better learn foreign language.
Warschauer (1996)	Computer-based Academic writing	167 ESL and EFL university students enrolled in academic writing classes in either the United States, Hong Kong, or Taiwan	1- indicated a positive attitude toward learning with computers. 2-Even more significant was that in examining the differences in motivation scores between classes, it was found that the class with the lowest mean score was the one in which computers were least necessary to the coursework.

APPENDIX 4

RESEARCH IN TURKEY ON PROVIDING ACCESS TO MATERIALS

RESEARC HER	TOOL	METHOD	EFFECT
Agca (2012)	mobile phone technology	Experimental Mobile supported printed material and only printed material were compared in order to find which one is effective to learn the same vocabulary content. (Pre-service students from FLE department of Gazi University)	Findings showed that mobile phone usage has a positive effect on vocabulary learning. Findings from interviews and surveys also supported this result.
Disli(2012)	online program (writing skills)	An online program to improve students' writing skills was designed throughout the term, the subjects used the online program and carried out the requirements of the online course both at school and outside class.(ELT students at Gazi University)	The online writing program proved to be effective in improving the subjects' writing skills.
Hismanoglu and Hismanoglu(2011)	internet-based pronunciation materials	Three problematic English vowels were taught to the students in the experimental group via internet-based pronunciation lessons. However, students in the control group were not exposed to internet-based pronunciation lessons but pronunciation instruction in a traditional fashion.	Language learners can solve their articulation problems with three problematic English vowels and hence improve their L2 pronunciation by being exposed to internet-based pronunciation lessons more effectively when compared to the control group.
Basoglu and Akdemir (2010)	vocabulary learning programs in mobile phones	Researchers investigated the effectiveness of using vocabulary learning programs in mobile phones on students' English vocabulary learning using mixed-method research design with sixty students studying in the Undergraduate Compulsory Preparatory Program of a public university located in the Black Sea region of Turkey.	Using mobile phones as a vocabulary learning tool is more effective than the traditional vocabulary learning tools.
Saran and Sefeoglu (2010)	mobile phone technology (vocabulary learning)	Researchers developed instructional materials to be delivered through mobile phones. The multimedia messages in this study allowed students to see the definitions of words, example sentences, related visual representations, and pronunciations. Once students finished reading multimedia messages, they received interactive short message service (SMS) quizzes for testing their learning.	Experimental group students of both intermediate and higher level outperformed the control group.
Çavuş and Doğan (2009)	Short Message Service (SMS)(vocabulary learning)	Experimental SMS messages were sent to the students at particular times of a day via a messaging software.	After the pre-test and post-test about vocabulary learning, it was concluded that mobile learning technologies have a positive effect on students learning new vocabulary items and on retention in the long run.
Nadire Cavus (2009)	Short Message Service (SMS)(vocabulary learning)	Experimental The students received 16 SMS messages daily and they were expected to read and learn the new words wherever they happen to be (at the Near East University, Department of Computer Information Systems).	The average scores before and after the experiment were 24.68 and 89.77 respectively, which is a clear indication of the success of the experiment.
Saran, Seferoğlu and Çağiltay (2009)	mobile phone technology (pronunciation)	Quasi-experimental The target content was provided to the students(preparatory class students at a university in Ankara) via sending web links through mobile phones and the control group students received the same content as paper-based.	The experimental group students outperformed the students in the control group in terms of acquiring correct pronunciation.
Özdener and Satar (2008)	CALL vocabulary materials(verbal oral feedback)	Experimental design was used to analyze the effects of different types of oral feedback techniques on the number of words recalled. The study group consisted of sixth and seventh grade students from different schools in Istanbul, Turkey.	One of the findings indicated that an animation technique, by means of a flashing animation, was more effective than written feedback in fostering skills like attention, perception, and word association.
Saran, Seferoglu and Cagiltay (2008)	mobile phone technology (vocabulary learning)	The multimedia messages that were sent allowed students to see the definitions of words, example sentences, related visual representations, and pronunciations. After students finished reading multimedia messages, interactive short message service (SMS) quizzes for testing their learning were sent.	The treatment was beneficial for retention especially for further reading and for giving them a clear understanding about the target English words.
Cont.			
Kılıçkaya(2005)	Powerprep: Preparation for the TOEFL Test software	Quasi-experimental Students (N=34) in experimental group studied using Powerprep software and the students in control groups studied the same program but on paper.	There was no statistically significant difference between the control and experiment groups in overall scores while there were significant differences in the scores on the reading and listening sections on behalf of the experimental group.

Seferoğlu (2005)	commercial accent reduction software	Quasi-experimental Advanced EFL learners at the university level on students' pronunciation at the segmental and supra-segmental levels participated (two senior year classes in the Department of Foreign Language Education at Middle East Technical University in Turkey).	The students in the experimental group performed better than the control group in the post-test. Accent reduction software was useful in improving students' pronunciation.
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APPENDIX 5

RESEARCH IN TURKEY ON PROVIDING OPPORTUNITIES FOR COMMUNICATION

RESEARCHER	TOOL	METHOD	EFFECT
Tüm(2012)	Asynchronous computer mediated communication (ACMC)(in writing)	The participants were two of 24 foreign students learning Turkish for one academic year. The students had Turkish lessons for 3 hours a week and they also had internet access in their hostels at Çukurova University, Adana, Turkey. The communication took place in a one-to-one asynchronous exchange of e-mails between the Turkish language instructor who gives homework requirements in the form of e-mails. The students received feedback from the instructor about the weekly assignments.	It was observed that the mistakes of the students decreased. Based on the analysis of the findings, it was concluded that ACMC is a useful strategy to improve foreign language learning.
Sahin(2009)	Synchronous computer mediated communication (SCMC)	In this quasi-experimental study, 11 intermediate college-level learners of French and Russian in a foreign language learning context and prospective language teachers as native speakers had six 30-minute synchronous online chat sessions completing communicative tasks.	This study proved the positive effect of synchronous computer-mediated communication on second language vocabulary acquisition.
Özdener and Satar(2008)	Computer mediated communication (CMC)	Participants' perspectives regarding their changing experiences and the types of tasks used were investigated through open-ended questionnaires after each session; a general insight with close-ended questionnaires given at the end of the study; and the use of the target language in communications among students by investigating the text communication logs.	The findings indicated that the students reduced use of Turkish thanks to the computer mediated communication and found it very beneficial for improvement of fluency in target language.
Seferoglu(2007)	Synchronous computer mediated communication (SCMC)	Quasi-experimental A class in Turkey and a class in Spain had synchronous audio communication over the Internet.	The difference between the posttest scores of the experimental group and control group was not statistically significant.
Aykaç(2005)	Computer mediated communication (CMC)	Survey study It explored teacher and student attitudes towards use of computer-mediated communication (CMC) to support teaching speaking skills. 20 Tourism students and 60 English instructors at Mugla University participated in the study.	1- Although students found speaking as the most difficult skill, both sets of EFL teachers and students were positive in use of CMC in support of speaking instruction. 2- All respondents indicated the need scaffolding to make the implementation of voice and text chat successful.

APPENDIX 6

RESEARCH IN TURKEY ON FOSTERING LEARNER MOTIVATION

RESEARCHER	TOOL	METHOD	EFFECT
Büyükyavuz and İnal(2012)	Interactive whiteboard(smartboard)	A case study conducted on teachers and learners' opinions of interactive whiteboard(smartboard) in an intensive English language preparation program at a state university in Turkey(through pre and post questionnaires along with structured interviews).	1- Teachers' opinions regarding interactive whiteboards changed in a positive way over time. 2- Using technology helps teachers develop more effective language teaching practices. 3- Interactive whiteboards enhance students' engagement in the lesson and help them acquire the lesson content more effectively through visual representations.
Tuncok (2010)	Computer mediated communication (CMC)	Questionnaire on students attitudes towards computer mediated communication in English.	1- 71.6% of the participants think they improve their vocabulary knowledge through CALL. 2- 63% of the participants also think that CALL practice improves their listening skills, while 55.9% think that they improve their speaking skills via CALL. 3- 58% of the students believe that their reading skills are improved through CALL which is different from the attributions of the teachers.
Dokur (2008)	Multimedia classroom (WordBird software)	Questionnaires and interviews The participants were 300 students from kindergarten to 8th grade in İstek Foundation Private Günen Schools in Adana. All of the students had 10 class hours of English lessons per week, 2 hours of which were in "multimedia classroom"	1- 76% of the participants think that WordBird software helped them to improve their English. 2- The students also think that it helps them to learn vocabulary and improve their speaking, as well.
Simsek(2008)	Information and communication technologies (ICTs) (reading skills)	In the study, a four-week module of an ICTs-integrated reading skills course was administered on 30 first year students of the foreign language education (FLE) department. To examine the students' attitudes towards the course and the new learning environment at the end of the teaching period, an attitude questionnaire was administered and interviews were conducted.	The findings indicated that although the students experienced some particular difficulties while using information and communication technologies, in general they were satisfied with the application of ICTs in their reading course and developed positive attitudes towards online courses.

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