



ORIGINAL RESEARCH PAPER

Probing into the Influence of Web Based and Mobile based Instruction on Vocabulary Learning; Lexical Depth and Breadth in Focus

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This study investigated the effects of web-based and mobile-assisted instruction on Iranian EFL learners' lexical depth and breadth. Out of 150 learners, 120 intermediate participants were selected through an Oxford Placement Test and randomly assigned to three equal groups: one receiving web-based instruction, one taught through Mobile-Assisted Language Learning (MALL), and a control group receiving traditional instruction. Prior to the treatment, a vocabulary pretest was administered to all groups. The instructional intervention lasted for eight sessions, during which the web-based group used online vocabulary learning programs and the MALL group received instruction via a mobile application. The control group was taught through conventional classroom methods. A posttest was then administered to measure the impact of the treatments. Data were analyzed using ANCOVA. The findings revealed that both web-based and mobile-assisted instruction significantly enhanced learners' lexical depth and breadth compared with the traditional method. Moreover, no statistically significant difference was observed between the effects of the two technology-enhanced instructional modes. Pedagogical and theoretical implications are discussed.

Keywords: Web and Mobile based Instruction, Vocabulary Learning, Lexical Knowledge, Lexical Depth, Lexical Breadth.

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Introduction

Due to its increased accessibility and inevitable role in the promotion of self-learning, as well as individual empowerment in the learning process, using technology especially Computer Assisted Language Learning (CALL) and Mobile Assisted Language Learning (MALL) can create a rewarding atmosphere in which efficient language learning take place and students are motivated to make more extensive use of the available resources. For Heafner (2018), technology has the ability to promote self-reliance among learners as it enables self-access to learning and offers learners several useful contributions to self-direct their learning and assume responsibility of it. Utilizing technology-based resources offers students greater accountability for learning and can improve their inner inspiration. The emergence of online mode of education along with over-increasing use of internet as the result of COVID-19 pandemic has changed the rate and quality of second language (L2) learning (Elumalai et al., 2021).

In fact, the shutdown of educational centers and the inability to teach face-to-face have highlighted the importance of virtual teaching and learning through technological devices, like cell-phones, computers and other devices (Cucinotta & Vanelli, 2020). In other words, the use of web-based and mobile-based instructions is seen as an option, and alternatives for EFL teachers and learners are an emerging need in times of pandemic. This need and necessity force EFL teachers to not only promote their digital literacy but also reinforce their propensity to embrace these technology-enabled teaching processes. Despite all the obligations imposed by the COVID-19 pandemic in using technology-based virtual learning in language teaching, learners in EFL contexts like Iran may face major problems such as lack of proper training with tools, not enough advanced facilities. Technologies and skills can lead to an unsuccessful experience and create a negative perception towards its adoption. The infancy of computer and mobile applications in Iranian EFL courses and the provision of greater exposure to web and technology in these contexts may lead to a change in their attitudes and perceptions as well as their learning performance. One of the challenging learning areas for EFL learners is L2 vocabulary achievement (Ellis, 2016).

For most of the language learners, acquiring new lexicons in a second language is a thorny task. According to Ellis (2016), teaching or learning vocabulary is a very challenging and complicated process. In vocabulary learning, memorizing the new items is considered as the primary strategy. In general, advanced learners try to learn new vocabularies in the given environment, while beginner learners would rather to memorize items individually relying on an inventory of different items (Akhlaghi & Zareian, 2015). Qian's (2002) framework indicates that the knowledge of vocabulary involves four inter-related dimensions: (i) the size of vocabulary, referring to the superficial knowledge of a learner concerning the meaning of some particular words; (ii) the depth of knowledge about vocabulary, including varied lexical features, like morphemic, syntactic, semantic, collocational, graphemic, phraseological, register and frequency; (iii) lexical organization, referring to the store, linkage, as well as presentation of words in the mental lexicon of a learner; (iv) the automaticity of receptive-productive knowledge, referring to basic processes

of accessing lexical knowledge for productive and receptive purposes, including encoding and decoding of phonology and orthography, reaching different features of the mental lexicon, integrated lexicon-semantic, morphological composing, and parsing.

A vast group of articles in the field of first and second languages have shown that the knowledge of vocabulary can be an ideal predictor of other language skills in acquiring new information from texts (Nation, 2011; Anderson, 2018; Qian, 2019; Read, 2019). However, few studies have investigated and compared the influence of web and mobile based instructions on the breadth and depth of vocabulary among Iranian EFL learners. Accordingly, this study tries to answer some questions:

1. Does web-based instruction have any significant influence on the depth and breadth of lexical knowledge among Iranian EFL learners?
2. Does MALL instruction have any significant influence on the depth and breadth of lexical knowledge among Iranian EFL learners?
3. Is there any significant influence of Web-based and MALL instructions on the depth and breadth of lexical knowledge among Iranian EFL learners?

Literature Review

The present research used a theoretical framework hinging on social constructionism. This view attributes human learning to their experiences and surroundings. Both Dewey and Vygotsky stated that human learning is tightly connected to their experience (Liu & Chen, 2010). Therefore, integrating technology and its practical nature are fundamentally based on constructivist theory in its original form (Schcolnik et al., 2006). When students participate in a technology-based classroom, they learn from the mutual experiences and interactions. Students, or constructivists, acquire more when individually build information, rather than through hearing and pure repetition. Therefore, knowledge is not imparted through a teacher or trainer, but through experiential participation in knowledge acquisition (Lin & Ju, 2013). Some different forms of this theory were used in education, focusing on the classroom shifting from teacher to student-centered learning (Ouyang & Stanley, 2014). Technology-based classrooms and their integration serve constructivist parameters in more ways than a hands-on, student-centered approach. Indeed, teachers and/or facilitators of said technology also engage in constructivism when using prior knowledge and experience (Liu & Chen, 2010). Based on the constructivist belief that previous interactions shape future learning, teachers, facilitators of technology integration, bring countless experiential lessons into the computer-based classroom space (Schcolnik et al., 2006).

The concept of web-based education (WBI) and mobile learning has a prominent place in both learning and teaching different languages. In particular, English language has gained popularity and popularity over other languages because most of the web content is published in English (Solak & Cakir, 2015). A number of technology-enhanced education experts have discussed the advantages of web-based education over the traditional classroom. Therefore, Flipped's wealth of resources, apps, and software is worth appreciating. Many research initiatives have been conducted to investigate the outcome of this new trend in English language teaching (ELT), particularly in the areas of instruction, materials design, and development

(Bootchuy, 2019; Lee, 2021; Son & O'Neill, 1999). Among the cutting-the-edge means of communication, cell phones have gained the upmost position, even higher than chat or email, because despite technical limitations, they act as a powerful learning tool. The introduction of mobile tools has affected people worldwide. Nowadays, the number of mobile device subscriptions has passed over 7 billion worldwide (ITU, 2015).

MALL concentrated on applying mobile technology in language learning. Mobile devices can be inserted into the pedagogical context as an instrument facilitating language learning. Therefore, several reviews were allocated to study the merits of mobile tools in acquiring new languages (e.g., Alrasheedi & Capretz, 2018; Cavus & Ibrahim, 2009; Frohberg et al., 2009; Gromik, 2012; Hwang & Tsai, 2011; Motiwalla, 2007; Sung et al., 2016; Taj et al., 2016; Thornton & Houser, 2005; Wong & Looi, 2010). Results showed that mobile devices are a useful tool in learning a new language. Along with affecting on cultural practices, it provides new contexts for learning languages (Pachler et al., 2010). Using this instrument, the learner controls the process of learning and promotes the entire cognitive status. Computer-assisted learning or e-learning allows any learner to apply a non-classroom environment at home using personal computers, either online or offline. But in MALL environment, students don't require sitting in the classroom or using computer to study, since learning by mobile phones or m-learning involves students with the chance to study on the bus, outside the home or at work. They can learn anytime and anywhere. MALL can be applied as an optimal solution for the time and space barriers in language learning (Miangah & Nezarat, 2012). Researchers stated that MALL presents convenient, rich, real-time and contextual opportunities for learners, regardless of being in or out of the context of the classroom (Kukulska-Hulme & Shield, 2017). M-learning presents unlimited content and geographic scope; therefore, it offers distributed virtual classrooms that can be accessed at any time (Seno et al., 2009).

Most researchers studied the web-based learning method manifest a similar opinion concerning its efficient and positive influences in increasing lexical knowledge. Studies by Zhang et al. (2010) and Khazaei and Dastjerdi (2010) have compared the effect of traditional and CALL procedures on the acquisition and retention of vocabulary of Chinese and Iranian learners of English. This research was conducted with the aim of investigating the use of web-based and online teaching in L2 vocabulary teaching. While one group considered the chosen vocabularies through web-based activities, the other one used paper materials for working on the same list. Results indicated that students can acquire different vocabularies in the short term through online activities more efficiently. In fact, relying on web-based approach would lead in better performance in lexical dimension than traditional way of receiving educational content. Web-based education presents different aspects of use in teaching and learning English. Due to the necessity of learning vocabulary in languages, many efforts were focused on facilitating and strengthening the complicated process of learning lexicons (Read et al, 2013). For example, Veda Slim Yetis (2010) focused on vocabulary learning through web-based instruction. Samples of his study were Turkish students learning

French. A traditional way was used for a month to teach vocabulary to students. Then, they took part in the exams. In the next month, lessons were offered online on the website. Again, students participated in several exams. Results indicated that the mean of exams increased using the Internet.

MALL literature revealed that m-learning mostly defined it as learning aided by mobile technologies which provides large exposure to the target content for EFL learners as with the assistance of mobile technology, they can do self-learning anytime, anywhere. In Taiwan, cell phone is the most popular among the mobile devices. The survey shows that in 2004 in Taiwan, the saturation of cell phones already exceeded 100%. One of the major capacities is texting through the short message service (SMS) and text voice communication (Kvavik, 2005). To address using SMS text messaging in the occupational high school, a survey to a class with 137 students revealed that over 73 percent of learners had one cell phone (Chung, 2006). The participants read messages accurately everywhere, anytime, between classes and before sleeping. They chose the mobile phone as their preferred medium for learning English rather than PC, due to availability of cell phones and no need for spending more time for logging like what they do with PCs. Based on participants' responses, for vocational high school students in Taiwan, the cell phone could be a potential learning medium (Kocoglu, 2008).

When an educator uses any type of technology ineffectively, students would learn in a passive way, which has a negative result. Gilakjani et al. (2013) suggests that for using a technology or theory framework is required to model an instruction. Norazah et al. (2010) showed that to use learning theories, technology-based media is needed. Recently, Krisbiantoro and Pujiani (2021) investigated whether MALL is more influential than Flipped classroom in presenting writing skills to EFL learners. Results indicated that MALL was more efficient than Flipped classroom in the process of teaching the writing skill.

Gonulal (2019) considered applying a very popular instrument, i.e. Instagram. Results indicated that students' language skills and components were promoted. Li and Cummins (2019) considered the effect of texting in improving students' vocabulary. Results showed that texting has an essential influence on the words possession, while no difference was evident in academic vocabulary mastery. Gharehblagh and Nasri (2020) studied using MALL to develop writing competencies of students. Findings revealed that after the post-test, students writing skill progressed dramatically. Also, experimental group showed better writing competencies than control group.

Barjesteh et al. (2022) addressed the impact of COVID-19 on the digitization of education by incorporating a visual vocabulary learning program to enhance vocabulary knowledge. The attack of COVID-19 on the education system has left many students' learning in limbo. For this purpose, the investigation of how to learn language with the help of mobile phone (MALL) to facilitate vocabulary knowledge of English as a foreign language (EFL) learners was done. To do so, a pretest-posttest quasi-experimental research design was adopted to investigate the impact of a newly developed application (i.e. visual vocabulary learning) in the EFL classroom.

In another research, Xodabande and Hashemi, (2023) studied English language learning with electronic textbooks on mobile devices in order to investigate the effects on vocabulary development of Iranian university students. For this purpose, 95 students participated in the study in an experimental group (N=50) and a control group (N=45). An explanatory sequential mixed design was used, and participants used traditional materials or mobile-based e-books to learn 600 words in English over the course of a semester. To evaluate the results of different learning conditions, the knowledge received from the desired vocabulary items was tested at three time points (i.e. pre-test, post-test and delayed post-test). The findings showed a significant main effect for time and both groups significantly improved their vocabulary knowledge from pre-test to post-test.

Method

Participants

The current study was performed on Iranian EFL learners from three language institutes in Tehran, Iran, during the 2023 academic year. The participants were randomly drawn from 150 learners who took the language proficiency test, assigned to the intermediate learners, and were randomly divided into 3 groups, including one control group and two experimental groups, ranging from 18 to 35. All participants were Persian native speakers. The participants included 87 female and 33 male EFL learners.

Research Instruments

The following instruments were adopted in this research.

Oxford Placement Test

A sample TOEFL OPT test without writing section was applied for checking the general language proficiency of participants. The main objective was to find out a homogenous sample. The items were extracted from 'Longman Complete Course for the TOEFL Test' by Philips (2018). The OPT involved three parts: vocabulary comprehension, grammatical structures and listening comprehension. The test included 100 items, the highest score of which is 100. Totally, 100 minutes was allocated for conducting the test.

Depth of Vocabulary Pretest and Posttest

Word-Associate Test (WAT), developed by Read (1993), is applied for measuring the depth of vocabulary. WAT measures the depth of lexical knowledge using associations between words, i.e., different syntactic and semantic relations between varied words. This test involves 40 target words. Every item contains a stimulus word, usually an adjective, and two partially identical boxes, each having four words, mostly nouns. One to three words of the left box are somehow synonymous with one feature or the entire meaning of the triggering word, while one to three words in the right box were synonymous with the triggering word. Usually, there are four correct answers for every item. There is no even distribution among answers. Generally, there are three states: (a) Right and left boxes involve two correct answers; (b) The left and right boxes have one and three correct answers, respectively; (c) The left box has 3 correct answers and the right box involves only one correct answer. For instance, the following options are given for the word Sound: a) bold, b) healthful, c) logical, d) dance, e) temperature, f) snow, g) sleep,

and, h) solid. Sound is synonymous with healthful, solid and logical. In addition, it combines with sleeping mode, so the proper options are A, B, D, and G. One point for every correct answer was considered in the test. In DVKT scoring, one point was given for each correctly selected word. Incorrect answers didn't lead to penalty for test takers. The maximum possible score for the whole test was 160. The test reliability was measured using the retest method to further estimate the reliability ($r=0.81$).

Pre-test and Post-test of Breadth of Vocabulary

For measuring the breadth of vocabulary among participants, Vocabulary Levels Test (VLT) was used, revised by Schmidt et al. (2001). Nation (1983) developed this test and modified it in 1990. In this version, there are 10 clusters in each level. Each cluster is of six words and three definitions. Totally, there are 150 items in the test. Subjects were required to match the right-sided definitions with corresponding words on the left. Items were not contextualized, then, no clues to meaning were offered. Nation (1993) states in scoring that a score of 12 or less than 18 (66.67%) in the level of vocabulary size indicates lack of mastery of this level. Based on Nation's scoring, authors hypothesized that 20 in every level indicates mastery of that level. Schmidt (2001) suggested that a range of 0.92 to 0.96 is available for reliability coefficients. But for ensuring the test reliability, after collecting the data, among the participants who participated in the research, they were randomly selected with a time interval of two weeks. The acquired reliability index was 0.93, which is an acceptable reliability index.

Data Collection Procedure

The participants were selected from 150 intermediate EFL learners. The initial 150 learners were given a proficiency test and based on the OPT results, 120 intermediate learners were divided into three equal groups, each with 40 learners. One experimental group received Web based instruction, and other experimental group was taught via MALL. On the contrary, a traditional method was used to teach vocabulary to the control group. Prior to experiment, the learners in the three groups were given a vocabulary pretest. Then, the instruction lasted eight sessions. In web-based group, the learners were provided with the Web assisted software programs for vocabulary learning, while in the second experimental group the learners received instruction via their mobile phones by a mobile application. However, vocabulary was taught to the control group using a conventional method. Finally, the posttest was conducted to find out the efficacy of the instructions.

Results

To choose a homogeneous sample of learners in this study, an OPT was administered among the 150 learners available to the researcher. Results have shown in Table 1.

Table 1.

Descriptive Statistics of the OPT Test

OPT	N	Minimum	Maximum	Mean	SD
	150	45.00	85.00	62.66	12.133
Valid N (listwise)	150				

According to this table, the mean and SD of the OPT scores were 62.66 and 12.13, respectively. Based on OPT test scores, 120 Iranian intermediate EFL learners, with scores within one standard deviation below or above the mean were chosen. Then, the selected subjects were divided into 3 equal groups, i.e., one control group and two experimental groups, each comprising 40 learners. Moreover, prior to conducting the parametric tests, the assumptions underlying these tests (such as the normality assumption) had to be checked. Thus, the kurtosis and skewness values for all the tests used in this study were presented and examined in Table 2 below. This table shows the descriptive statistics of the employed tests.

Table 2.

Descriptive Statistics of Vocabulary Pretests and Posttests for the Three Groups

Tests	N	Mean		Std. Deviation		Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error	Statistic
EG1 Pretest	40	18.2500	2.14536	2.14536	-1.605	.374	4.607	.733	4.607
EG1 Posttest	40	20.2250	2.65530	2.65530	1.622	.374	2.767	.733	2.767
EG2 Pretest	40	18.7250	2.36413	2.36413	.371	.374	.900	.733	.900
EG2 Posttest	40	19.4750	1.86723	1.86723	.825	.374	.536	.733	.536
CG Pretest	40	19.2750	3.89600	3.89600	-.607	.374	-.228	.733	-.228
CG Posttest	40	18.9250	2.67359	2.67359	-.509	.374	2.230	.733	2.230

The skewness and kurtosis values lower than ± 2.00 indicate that a given distribution is normal, while values greater than ± 2.00 show that the distribution has been skewed and/or peaked. Because all the skewness and kurtosis values lined up under the skewness statistic and kurtosis statistic columns of Table 2 represent values lower than ± 2.00 , it could be concluded that the distributions for all the pretests and posttests of the three groups used in this study met the assumption of normality. In addition to the assumption of normality, assumptions concerning variance homogeneity, linearity, and the homogeneity of the regression slopes were checked for ANCOVA tests conducted in the current study, and no violations of these assumptions were ensured as well. The first research question sought to figure out whether Web based instruction of vocabulary could significantly affect lexical depth and breadth of EFL learners in Iran. The pretest and posttest scores of EG1 and CG groups were used to conduct a one-way ANCOVA. Results are presented in Tables 3 and 4.

Table 3.

Descriptive Statistics for Vocabulary Posttest Scores of EG1 and CG Learners

Groups	Mean	SD	N
EG1	20.2250	2.65530	40
CG	18.9250	2.67359	40
Total	19.5750	2.72715	80

Table 3 suggests that vocabulary posttest mean score of the EG1 learners ($M = 20.22$) was greater than the vocabulary posttest mean score of the CG learners ($M = 18.92$). In order to find out whether the EG1 learners obtained significantly higher scores than the CG learners regarding their vocabulary, the results presented for one-way ANCOVA in Table 4 had to be checked:

Table 4.

One-Way ANCOVA for the Vocabulary Posttest Scores of EG1 and CG Learners

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	94.599 ^b	2	47.299	7.388	.001	.161
Intercept	436.668	1	436.668	68.208	.000	.470
Pretest	60.799	1	60.799	9.497	.003	.110
Groups	49.082	1	49.082	7.667	.007	.091
Error	492.951	77	6.402			
Total	31242.000	80				
Corrected Total	587.550	79				

Table 4 indicates that the relevant p value (i.e., one in the row labeled Groups) was smaller than the alpha level of significance ($.007 < .05$). This shows a statistically significant difference between the learners in EG1 ($M = 20.22$) and CG ($M = 18.92$) concerning vocabulary posttest. In other words, Web based instruction of vocabulary was shown to be more effective than conventional instruction concerning vocabulary development of EFL learners in Iran. The effect size for this analysis was large (.091).

In the second research question, the MALL influence on the knowledge of vocabulary among Iranian EFL learners was examined. To answer this question, the vocabulary posttest scores of the EFL learners in EG2 and CG were compared using one-way ANCOVA.

Table 5.

Descriptive Statistics for Vocabulary Posttest Scores of EG2 and CG Learners

Groups	Mean	SD	N
EG2	19.4750	1.86723	40
CG	18.9250	2.67359	40
Total	19.2000	2.30794	80

It could be found in Table 5 that on the vocabulary posttest, the EG2 learners ($M = 19.47$) obtained a slightly higher mean score than the CG learners ($M = 18.92$). The researcher examined the p value under the Sig. column in front of the Groups row in Table 6. This was for finding out whether the difference between the vocabulary posttest mean scores of the two groups was statistically significant or not.

Table 6.

One-Way ANCOVA for Vocabulary Posttest Scores of EG2 and CG Learners

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	44.752 ^b	2	22.376	4.582	.013	.106
Intercept	494.109	1	494.109	101.174	.000	.568
Pretest	38.702	1	38.702	7.925	.006	.093

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Groups	8.917	1	8.917	1.826	.181	.023
Error	376.048	77	4.884			
Total	29912.000	80				
Corrected Total	420.800	79				

The results in Table 6 show that the p value corresponding to the groups row was larger than the alpha (i.e., $.181 > .05$), implying a statistically significant difference between the vocabulary posttest mean scores of the EG2 ($M = 19.47$) and CG ($M = 18.82$) learners. It could, hence, be construed that MALL of vocabulary was approximately as effective as conventional instruction as far as the vocabulary of EFL learners was concerned. Finally, the current study evaluated whether there was any significant difference between the influences of Web based instruction and MALL on vocabulary. For this, another one-way ANCOVA was employed for comparing the vocabulary posttests of the EG1 and EG2 learner. Results are in Tables 7 and 8:

Table 7.

Descriptive Statistics for Vocabulary Posttest Scores of EG1 and EG2 Learners

Groups	Mean	SD	N
EG1	20.2250	2.65530	40
EG2	19.4750	1.86723	40
Total	19.8500	2.31178	80

It is evident in Table 7 that on the vocabulary posttest, the EG1 learners ($M = 20.22$) received a higher mean score than did the EG2 learners ($M = 19.47$). To figure out whether this difference between the vocabulary posttest mean scores of the two groups of learners reached statistical significance or not, the researchers needed to check the p value under the Sig. column in front of the Groups row in the ANCOV table below:

Table 8.

One-Way ANCOVA for Vocabulary Posttest Scores of EG1 and EG2 Learners

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	64.860 ^b	2	32.430	6.988	.002	.154
Intercept	195.522	1	195.522	42.131	.000	.354
Pretest	53.610	1	53.610	11.552	.001	.130
Groups	16.900	1	16.900	3.642	.060	.045
Error	357.340	77	4.641			
Total	31944.000	80				
Corrected Total	422.200	79				

According to results in Table 8, no significant difference was evident between the vocabulary posttest mean scores of the EG1 ($M = 20.22$) and EG2 ($M = 19.47$) learners, as the p value corresponding to the Groups row was larger than the alpha level of significance (i.e., $.060 > .05$). This indicates that the difference between the effects of Web based instruction and MALL was not large enough to be of statistical significance.

Discussion

The present study inquired about the influence of web based and mobile-based instructions on the lexical depth and breadth of EFL learners. Results showed that both types of instruction were of a significantly positive influence on the lexical depth and breadth of learners. It was identified that both Web based and MALL instructions had nearly the same effect on EFL learners' lexical depth and breadth. Findings are consistent with Sampson (2021), indicating that web-based teaching involves independent learning through asynchronous communication and self-study texts. ESL learners using Internet were of positive attitudes concerning WBL, and showed interest in additional classroom activities (Son, 2018). Many researchers claim regarding learners' development after using computer programs in promoting quality and quantity of lexicons.

Results in the present study are in line with Altiner (2019). Results also supported by other researchers who emphasized on the relation between technology and learning as well as tendency of students in using varied technologies. Moreover, using technology would contribute in positive attitudes among learners (Oblinger, 2005). Ghabanchi and Anbarestani (2008) pointed to influences of CALL on increasing the vocabulary knowledge of intermediate EFL learners in Iran. Results show that CALL resulted in better yields in pronunciation of words and contextualized vocabulary learning. Naraghizadeh and Barimani (2020) described the influence of CALL on vocabulary leaning of Iranian EFL learners. Their findings indicated a significant difference between the control and experimental groups in terms of lexical knowledge. CALL instruction led in enhancement in EFL learners' vocabulary knowledge.

The results on the efficacy of both web based and mobile-based instructions can be explained in light of the sociocultural approach to learning. According to sociocultural approach, learning is considered as the interaction with the surrounding situations and environments. While behaviorism centered on the associations' accumulations in the experienced situations and cognitive approaches stood on the footing of internally organized cognitive concepts in categories, the sociocultural approach places the emphasis on the significance of social- and culture-related contexts for learning (John-Steiner & Mahn, 1996). The technique was described by Greeno as "the knowledge which is distributed among people and their surrounding environments" (p. 12). This shows that the sociocultural method takes into account learners' physical and social environments while constructing knowledge. Any items, artifacts, instruments, literature, and groups with which an individual interacts are considered to be their immediate surroundings (John-Steiner & Mahn, 1996).

The method first put forth by Vygotsky in the 1920s gave rise to the notion that learning must be seen as a social process involving interactions with others. In contrast to other learning views, this approach examines the notion that learning is supported by a social process and is then sparked by a person's internalization of what the activities involve (Vygotsky, 1978). Language formation and usage in language classes are influenced by social interactions between the teacher and

students as well as between students themselves John-Stiener & Mahn, 1996; Vygotsky, 1978, to name few).

Conclusion

Based on the findings, it is concluded that EFL students' learning takes place by through their reciprocal interactions with each other as well as the surrounding environments and materials with which interactions through organized activities take place (Greeno, 1996). Social interactions and in this context, in-class peer collaboration construct the needed knowledge and stimulate the internalization of the knowledge which according to Vygotsky calls the true learning into existence. Therefore, it is argued that learning does not develop in a vacuum or by itself. Understanding how well the sociocultural lens for learning functions depends critically on the interaction that is emphasized to promote learning. This strategy is presented by Vygotsky's (1978) ZPD, which emphasizes the importance of a more competent peer who supports and promotes the learning process in a learning environment. A more competent person must help the learner grasp the objectives of a task and how it should be completed successfully as part of the evaluation of progress (Vygotsky, 1978). Such competent individuals can be easily accessed through both web based and mobile-based tools.

In terms of educational objective, there are some implications for EFL learners and teachers. In addition, they are influential for designers of language curricula to offer tasks highly capable of enriching the motivation of students to apply Web based tools and MALL for independent language learning. Using computers and mobiles is an influential factor in instructors' opinion about mobile and computer integration. By using Web based tools and MALL, students have varied opportunities in learning English, such as presenting real-time materials and communicating with fellows around the world (Godwin, 2018). While focusing on the breadth and depth of lexical learning, this study suggests considering other language skills. The same methodology can be applied for studying students with different age and language proficiency. Future research can consider the teachers' and learners' perceptions on Web based tools and MALL.

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بررسی تاثیر آموزش مبتنی بر وب و تلفن همراه بر عمق یادگیری واژگان با تمرکز بر گستردگی واژگان

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این پژوهش به بررسی تأثیر آموزش مبتنی بر وب و آموزش یاری‌شده با تلفن همراه بر عمق و گستره دانش واژگانی فراگیران ایرانی زبان انگلیسی به‌عنوان زبان خارجی می‌پردازد. از میان ۱۵۰ زبان‌آموز، ۱۲۰ نفر از طریق آزمون تعیین سطح آکسفورد انتخاب و به‌طور تصادفی در سه گروه مساوی قرار گرفتند: گروهی که آموزش مبتنی بر وب دریافت کرد، گروهی که از طریق یادگیری زبان با کمک تلفن همراه آموزش دید، و گروه کنترل که تحت آموزش سنتی قرار گرفت. پیش از شروع دوره، پیش‌آزمون واژگان در همه گروه‌ها اجرا شد. مداخله آموزشی طی هشت جلسه انجام گرفت؛ به‌طوری‌که گروه مبتنی بر وب از برنامه‌های آنلاین یادگیری واژگان استفاده کرد و گروه یادگیری با تلفن همراه، آموزش را از طریق یک برنامه تلفن همراه دریافت نمود. گروه کنترل از روش متعارف کلاس درس پیروی کرد. پس‌آزمون جهت سنجش اثر مداخلات اجرا شد و داده‌ها با استفاده از تحلیل کوواریانس تحلیل گردید. نتایج نشان داد که هر دو روش آموزش مبتنی بر وب و آموزش یاری‌شده با تلفن همراه در مقایسه با روش سنتی، موجب بهبود معنادار عمق و گستره دانش واژگانی فراگیران شدند. همچنین، تفاوت معناداری میان تأثیر دو شیوه آموزشی مبتنی بر فناوری مشاهده نشد. دلالت‌های نظری و آموزشی نیز ارائه شده‌اند.

واژه‌های کلیدی: آموزش مبتنی بر وب، یادگیری زبان با کمک تلفن همراه، یادگیری واژگان، عمق واژگانی، گستره واژگانی.

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