Models of assessment in the classroom: a comparative research of CALL-based vs. traditional assessment on vocabulary learning among Iranian EFL learners

Fatemeh Shamshiri[1], Fariba Rahimi Esfahani[1*] and Seyed Esmail Hosseini[1]

*Correspondence:
rahimi_fariba@yahoo.com;
f.rahimi2023@yahoo.com

[1] Department of English,
Shahrekord Branch, Islamic Azad
University, Shahrekord, Iran

Abstract

There are a few empirical studies on comparative effects of CALL-based assessment and traditional assessment on Iranian EFL students' vocabulary learning; therefore, the present research tried to fill this gap. To achieve this purpose, the NELT was administered to 89 EFL students, and 58 of them whose level of English proficiency was the intermediate were chosen for the target sample of the current research. Then, they were randomly divided into two groups of control and experimental, and a vocabulary pre-test was given to them. Next, the experimental group (EG) received a CALL-based assessment treatment, and the control group (CG) received a traditional-based assessment instruction. After instructing 100 new words to both groups, a vocabulary post-test was conducted, and an ANCOVA test and a paired samples *t*-test were utilized to analyze the scores of the pre- and post-tests. The gained outcomes indicated that the EG outstripped the CG on the post-test of vocabulary. It was concluded that using the CALL-based assessment was more useful than the conventional assessment for learning English vocabulary items. The research findings can be beneficial for EFL teachers, learners, and curriculum designers.

Keywords: CALL-based assessment, Traditional assessment, Vocabulary learning

Introduction

Utilizing novel approaches can be a helpful way to promote learning and teaching quality. Computer-assisted language learning (CALL) that is referred to the use of computer in English learning and instruction is one such approach. CALL is the study about computer-assisted language learning and instruction, according to Levy (1997). Additionally, Davies (2002) describes CALL as a technique for learning and teaching a language in which the computers are utilized to facilitate the reinforcement, presentation, and evaluation of learning materials while typically incorporating a significant amount of interaction. CALL is described by Levy as "the study and search of computer usages in language learning and teaching" (1997, p. 15).

CALL enables instructors to supply students personalized instructions so they may work at their own speed (Nachoua, 2012). CALL can also encourage linguistic exchange between instructors and students (Namaziandost et al., 2023; Tatiana Dina & Ciornei, 2013). CALL can support the use of empirical practice and learning in various settings, give students helpful feedback, promote pair and group work, foster global and exploratory learning, increase students' attainment, open doors to more true resources, promote better interactions, individualize instruction, and inspire students (Lee, 2000).

Computers are a vital part of any educational system nowadays. According to Prensky (2000), for today's students, it is impossible to imagine the universe without the digital media, the Internet, and the computers. Computers may assist pupils to customize their instruction, since it was shown that computers may be quite helpful in this regard (Vahdat & Eidipour, 2016). By personalizing material, using animated things on the screens, and offering exercises that integrate difficulties and interests in a specific setting, CALL can increase students' motivation. Additionally, Vahdat and Eidipour (2016) state that CALL emphasizes how the learning process is student centered; students control the pace of learning and select what can be acquired and how it can be acquired, which helps them have confidence about their academic progress.

Using CALL-based assessment can develop English language learning. Learning and assessment are not separable, and assessment tells us how much students achieve the target educational goals. Since it may impact both teaching and learning, assessment is a necessary component of education. When done in a genuine manner, it can offer helpful feedbacks and adjustments to improve the instructing and learning procedure. Furthermore, assessment may be motivational and encouraging by effectively involving or engaging students in the learning process (Alderson & Banerjee, 2001). Based on Baniabdelrahman (2010), assessments can also assist teachers via aiding them in recognizing the strong points and shortcomings of their learners. Moreover, it is stated that assessments are seen as moral, efficient, fair, and instruments to gauge a variety of students' characteristics (Mousavi, 2012; Namaziandost & Heydarnejad, 2023).

CALL-based assessment describes the assessment of students learning with methods including information and communication technologies (Chen et al., 2021). This does not restrict online assessment to fully online courses and can also be implemented in a blended learning format (Heil & Ifenthaler, 2023). CALL-based assessments may take on different pedagogical functions as part of online learning environments (Tempelaar, 2020), for example, scaffolding students to complete a task and measuring how much support they need (Schultz et al., 2022) or providing students with semantic rich and personalized feedback, as well as adaptive prompts for reflection (Schumacher & Ifenthaler, 2021).

In addition to being more suitable in virtual classes, CALL-based assessments have grown in importance in the field of education since they allow teachers to monitor students' progress in real time (Aldosari et al., 2023). A digitalized learning environment is developed in the classroom through the use of CALL-based evaluation tools. Additionally, CALL-based evaluation tools help teachers monitor student development and give comments in response to such data. Teachers can monitor their pupils' progress and level of interest more closely when these exams are taken online (Teng et al., 2022).

In this research, CALL-based assessment is used to help EFL learners develop their vocabulary knowledge. As a crucial indicator of linguistic skill, mastering vocabulary is critical (Schmitt, 2008). A lack of vocabulary terms makes it difficult to study any foreign or second languages successfully. According to Macis and Schmitt (2017), lack of adequate vocabulary knowledge, EFL learners might not be capable to exhibit the necessary outcomes in their language learning skills and process. According to Adam (2016), EFL learners' capacity to interact in everyday situations is significantly hampered by vocabulary ignorance. As a result, it is anticipated that EFL students will be familiar with the relevant terminology.

In recent years, the value of vocabulary development has been the most essential focus in language instruction, claim by Dilek and Yuruk (2013). It is impossible to undervalue the importance of acquiring and teaching vocabulary while learning a language. This indicates that vocabulary knowledge is a necessary component to learn a foreign language. People cannot express their thoughts, communicate, or utilize language if they do not know the words. Thus, being well-versed in a foreign language's vocabulary is necessary to achieve high proficiency (Dilek & Yuruk, 2013).

The assessments are the most important component of the educational system since they provide students with a precise image of where they stand. It serves as a catalyst and provides learners with constructive criticism, which motivates them to do better. Therefore, the focus of the current research, which has not received as much attention, is on the vocabulary learning of Iranian EFL students through the use of CALL-based evaluation. The use of CALL-based evaluation in the educational system is a significant technological advancement. Today's testing procedures should not be difficult because technology has completely transformed the way that education is delivered. Today, it is simpler to provide evaluations online because the paper and pencil option is no longer necessary. Exams are conducted on a computer which ultimately saves not only time but also the most important product that is paper. So, it was of great importance to know how learners could improve their vocabulary learning through CALL-based assessment. Consequently, the succeeding questions were raised:

- *RQ1*: To what extent does applying CALL-based assessment produce positive effects on developing vocabulary learning among Iranian EFL students?
- *RQ2*: To what extent does applying traditional assessment produce positive effects on developing vocabulary learning among Iranian EFL students?
- *RQ3*: Does applying CALL-based and traditional assessment develop vocabulary learning among Iranian EFL students differentially?

Review of the literature

It is common knowledge that incorporating technology into English language instruction entails the inventive use of strategies, tools, approaches, and resources that are specifically relevant to English teaching and produce the attainment of desired goals (Hazaea & Alzubi, 2016). Since it offers numerous potential probabilities to improve both the delivery and content of the pedagogy typically relevant to conventional English language education, social media networks are now typically regarded as significant educational tools in a number of learning and teaching settings. This is especially

true for English language teaching (Obari & Lambacher, 2015). Using technology, trainees are better able to acquire and enhance their language knowledge and abilities, according to established pedagogical theories and hypotheses. The application of technologies in English learning and teaching necessitates incorporating cutting-edge technologies that assist students in achieving the desired goals (Ertmer, 2005).

One subcategory of technology is computer. Computers first appeared in schools in industrialized nations in the late 1950s, and they continue to advance daily all across the world. They can now process and store a lot more data and have improved in terms of power, speed, use, convenience, and cost (Gündüz, 2005). The usage of computers for learning a language has changed since the turn of the century of twenty due to the Internet computerized communications. Computers are being used for more than just information processing and display; they may also be used for communication. Despite being there since the first part of the twentieth century, computers were not really utilized in education until the 1960s (Chung & Choi, 2021). CALL developed throughout the 1970s as a consequence of advances in investigation on the application of computer for language learning goals and for setting up favorable settings for language acquisition (Ratnaningsih et al., 2019).

CALL is a practical instrument that can improve the standard of language learning and instruction. The following factors may be the reasons:

- Utilizing computers in the classroom for training four language skills to pupils may be a good idea.
- Both outside and inside of the classrooms, CALL may assist children to learn.
- CALL can also accommodate the students' need for ongoing, customized, and real-world activities.
- CALL is a learner-centered strategy because it lessens students' indifference and the absence of engagement in the process of learning.
- CALL may incorporate four linguistic abilities.
- Students can receive rapid feedback from computers (Bani Hani, 2014).

Researchers and educators have frequently praised CALL, although CALL education has its own shortcomings. First, computers cannot accurately evaluate how well pupils communicate with people verbally, and what a machine pronounces will never sound the same as what a person pronounces (Bas, 2010). Second, there are questions about the CALL software's dependability and quality. The commercial materials which particular teachers rely on could not yield the desired pedagogical results. Third, inadequate computer skills among certain teachers and pupils might hinder the learning process (Bas, 2010).

Some instructors evade utilizing technology in their classes for the reasons listed below:

- Lack of CALL teaching experience
- The absence of onsite technological assistance for instructors
- Lack of computer accessibility
- The absence of CALL-trained instructors to train pupils' computer skills

- The absence of computers, lacking in funding
- The expensive cost of technological instruments and the quick pace of technological progress (Al-Kahtani & Al-Haider, 2010)

Furthermore, Levy (1997) identified particular drawbacks to using CALL in the language classes: (1) "materials generated by inexperienced instructors, (2) inadequate improvement of regular language practices, (3) weak linguistic modelings, (4) false starts and imperfect realizations of CALL, and (5) restricted abilities of computer in managing regular language (p. 2).

CALL has both benefits and drawbacks overall, but its benefits outweigh the shortcomings. It may be decided that CALL can help learning and teaching a language, and using a computer can improve students' performance (Hashemifardnia et al., 2021). The researchers reach the conclusion that applying CALL cannot diminish the importance of instructors because they can aid learners to emphasis on the fundamental purposes of language learning and communication (Bani Hani, 2009). As a result, teachers should not be disregarded or taken over by computers.

Using computer can accelerate the process of assessment. In the field of learning and teaching, assessment is a technique used via teachers and pupils within learning to offer the required feedback to change ongoing teaching and learning to help students achieve specified educational goals (Robinowitz, 2010). Assessment, based on Popham (2008), is a planned process in which educators use data on learners' progress to adjust their current educational process or pupils use it to modify their existing instructional approaches. By bridging the gap among pupils' present learning environment and their favorite learning objectives, assessment aims to improve learning (Heritage, 2012).

Irrespective of the instructional strategies applied, assessment has a crucial role in the learning and teaching process and provides the students with constructive criticism (Alias et al., 2015). In fact, assessments might be used as a helpful strategy to develop learning different aspects of a language (Ashraf & Mahdinezhad, 2015; Lee & Hannafin, 2016) owing to their focus on using real-world contexts, identification of students' strong and weak points, encouragement of people decision, and use of open disclosures of criteria and rating norms (Brown & Abeywickrama, 2010; Brown & Hudson, 1998). According to Cheng and Warren (2005), it is beneficial for both students and instructors to be involved in the processes, techniques, and outcomes of the assessment.

The literature on the value of CALL-based assessment examines how this technique benefits society by boosting educational opportunities and raising learning results. Scalability, flexibility, and effective feedback mechanisms are just a few of the benefits that CALL-based assessment has to offer. These features help to promote accessibility and inclusion (Fitriyah & Jannah, 2021). Online evaluation has been proven to solve some of the issues that traditional assessment methods have in terms of societal value. Online assessment offers for more effective administration, grading, and feedback procedures by utilizing digital technologies (Abduh, 2021). This not only helps teachers save time and money, but it also gives students timely feedback, allowing them to evaluate their performance and make the required corrections right away.

Additionally, online testing has the ability to reach more students, eradicating distance obstacles and granting equal access to assessment and evaluation. Individuals and society as a whole gain from this inclusion, which helps to create a more equal educational system (Yilmaz et al., 2020).

The philosophy that underpins our investigation is connectivism, which Siemens and Downes initially introduced in their first online course in 2008. They believed that "learning is the act for linking a particular node and information resource," and that "knowledge is shaped by networks" (Li, 2017, p. 11). In reality, connectivism is a worldview that encourages MOOCs since it holds that connections make knowledge transfer easier, and that all students may contribute to information dissemination (Waks, 2016).

According to connectivism, learning takes place when students connect their knowledge to the collective wisdom of the society (Anderson & Dron, 2011). In social/external, conceptual, and biological/neural settings, these linkages are made (Siemens, 2008). Theorizing on how knowledge is communicated via individual interactions, particularly in web environments, connectivists believed that knowledge is not simply passed from instructor to students, and that learning does not take place in a sole setting (Kop, 2011). Connectivists held the view that pupils are accountable for their own education. Learners create and control their own learning according to connectivist principles (Kesima & Altinpulluka, 2015).

Regarding the usefulness of CALL on learning English language, several empirical implications were done, for instance, the effectiveness of online vocabulary instruction vs. the conventional approaches used in upper-intermediate academic English classes was compared by Kilickaya and Krajka (2010). Thirty-eight Turkish participants from a private university in Ankara were chosen for this research sample, and they were separated into a control group (CG) and an experiment group (EG). Students in the CG used vocabulary notebooks and cards to review words in 10 reading passages. The experimental group of students used WordChamp software to practice the identical vocabulary words included in the texts. Furthermore, the vocabulary instruction was examined on a regular basis with the two classes. A test was used to assess the effectiveness of the two techniques after the treatment. Their research found that the EG outstripped the CG, and that the EG participants recalled the terms learned online better, as indicated via a 3-month follow-up post-test.

Al-Mansour and Al-Shorma (2012) conducted a research on sixty university students (an EG & a CG). The EG employed a computer in addition to the conventional approach, while the CG exploited only the conventional way. The two classes were given a pretest prior to the beginning intervention, and this exam was given as a post-test shortly thereafter. The outcomes of the investigation demonstrated that pupils who were trained using computers outstripped those who were taught using the traditional technique alone.

Kiliçkaya and Seferolu (2013) evaluated the influence of CALL instruction on the utilization of CALL-oriented tasks in the classrooms of in-service language instructors. Thirty-five pre-service English teachers were the participants of this research. The data were collected via administering the questionnaires and holding an interview. The results indicated that the CALL-based training assisted teachers in incorporating various CALL-centered contents and instruments into their teaching and classes.

Khoshsima and Mozakka ([2017](#)) aimed to explore the influence of CALL as a method of learning and teaching a foreign language on listening comprehension enhancement. In this experimental study, 30 upper-intermediate EFL learners from two separate classrooms at an English language institute were chosen. Two groups, EG and CG, were chosen, and an FCE listening pre-test was administered to verify listening skill homogeneity. A CALL-based instruction was employed in the EG, whereas a conventional teaching was utilized in the CG. When the treatment ended, a listening post-test was administered to the two groups. In the listening post-test, the EG outstripped the CG. The findings demonstrated that using CALL generated a substantial influence on development of learners' listening ability.

Chen and Wang ([2018](#)) investigated the effect of online evaluation as a kind of CALL-based assessment on willingness to communicate (WTC) of EFL learners. The results suggested that because online testing offered a less scary and more anonymous atmosphere, it increased students' WTC. The study also emphasized how crucial it is to take into account the particular characteristics and needs of online exams in order to facilitate efficient communication.

Alotumi ([2018](#)) investigated the effects of a CALL-based teaching model on EFL learners' accomplishment on the TOEFL. The participants of this research were 30 pupils haphazardly divided into the EG and the CG. The information was gathered during 8 weeks by using pre- and post-tests design. Furthermore, the researcher interviewed the experimental respondents to extract information about their ideas about CALL. The results of the research showed that an outstanding difference was observed between the EG and the CG in gain score of speaking, listening, reading, and writing. The results revealed that the experimental respondents presented positive opinions about CALL.

Grenner ([2019](#)) explored how CALL can inspire the pupils to enhance their language learning. To achieve the objective, fourteen papers were investigated based on Dörnyei's motivation framework. The findings indicated that CALL as an instructional instrument produced effective outcomes, via supplying genuine materials (materials students face in their day-to-day lives) in the student-centered environments. Besides, the results demonstrated that the teachers' and pupils' perceptions toward CALL factors were positive.

Enayati and Pourhosein Gilakjani ([2020](#)) studied the impact of CALL on the word knowledge development of Iranian intermediate students. The individuals were assigned to two groups by the researchers: EG and CG. A pre-test of 80 items was given to the participants to assess their prior knowledge of English vocabulary. The EG was trained by TEM software, while the CG was trained traditionally. A 65-item test was given after 12 sessions to measure the success of the instruction. The data was examined using the *t*-tests, and the outcomes displayed that the EG outdid the CG and had good opinions regarding CALL.

In their study, Akmak et al. (2021) sought to determine how utilizing CALL-based vocabulary software affected the L2 vocabulary learning enhancement of EFL learners. In this study, 76 pre-intermediate EFL students were assigned to two groups: an EG and a CG. Before the instruction, both groups were given a vocabulary pretest. The EG was obliged to utilize the mentioned vocabulary application on their mobile devices, laptops, and other portable devices at their leisure during the course of the treatment. They were able to access and use many flashcards on a range of subjects such as languages,

arithmetic, and science, by exploiting the application. The CG was instructed applying a common method. The outcomes showed that in the vocabulary post-test, the EG outstripped the CG.

Emami and Amirghasemi (2022) investigated the influences of CALL on vocabulary learning of EFL students. Seventy Iranian English learners were recruited for this purpose and divided into two groups of 30. The vocabulary knowledge scale was then used to assess pre-exposure to the target items. Following the therapy phase, the learners' vocabulary learning was assessed using the same teacher-created vocabulary exam. The post-test findings revealed that this strategy might positively improve the word knowledge of the EG respondents. The overall findings of the study may reject the null hypothesis of this study, which predicted that CALL teaching had no influence on the vocabulary development of Iranian EFL learners.

Hanafiah et al. (2022) attempted to examine the effects of CALL on vocabulary development, speaking ability, and speaking anxiety in Indonesian EFL learners. Sixty EFL students were selected as the study's respondents in order to achieve this goal. A control group and an experimental group were formed from them. The groups were then given the study's pretests, which included a vocabulary exam, a speaking test, and the foreign language classroom anxiety scale (FLCAS) questionnaire. After that, an online lesson was used to teach the experimental group the discussions and vocabulary words from six lessons in *Family and Friends Book 6.* On the other hand, the control participants received the same dialogues and vocabulary lessons through traditional education (face-to-face class). The post-tests for vocabulary, speaking ability, and anxiety were given to the groups after the discussions and vocabulary items had been taught in order to ascertain the effects of the intervention on their vocabulary, speaking, and anxiety. Independent samples and paired samples *t*-tests were used to examine the data, and the results showed that the experimental participants outperformed the control participants on the speaking and vocabulary posttests. Additionally, the results of the questionnaire showed that after receiving treatment, the experimental individuals experienced less speaking anxiety than the control participants.

After doing an exact survey on the related literature, it was found that using CALL-based instruction can develop English language learning among EFL learners. In addition, it was found that most related empirical studies were conducted on male students rather than female ones. Additionally, we discovered that there are few empirical studies comparing the effectiveness of CALL-based vs. traditional assessment on vocabulary learning among Iranian EFL learners. Consequently, this paper intended to compare the impacts of using CALL-based and traditional assessment on Iranian female EFL learners' vocabulary learning.

Methodology

Subjects

The subjects in this study were Iranian female learners studying English as a foreign language at the Farghoyan Javid Institute in Isfahan that were selected using a convenience sampling method. Prior to research, a *Nelson English Language Exam* (NELT) was conducted as a proficiency test for the goal of homogeneity, and research participants were chosen on the bases of the outcomes of this proficiency exam. As intermediate learners,

58 students with scores ranging from one standard deviation minus to one standard deviation plus the mean participated in the study. The researches' participants were accidently separated into two groups of 28 people, one of which was designated as the experimental group (EG) and the other as the control group (CG). The respondents ranged in age from 17 to 29.

Instruments

The NELT was utilized to homogenize the research subjects. It is a battery of 40 distinct examinations for measuring language skills ranging from beginner to advanced. The levels are labeled 50, 100, and 500. Each exam has 50 items. A test of intermediate level 250A was employed in this investigation. The test reliability ($r = 0.80$) was calculated using the KR-21 methodology, and its validity was validated by three English specialists.

The other tool was a pre-test vocabulary exam for the research. It consisted of 40 multiple-choice questions based on the book *504 Absolutely Essential Words.* At the intermediate level, this book is the most often used vocabulary resource book in Iranian foreign language institutes. According to the book's level and content, it is intended for intermediate and high school students. The test's reliability and validity were assessed. After developing the exam, it was handed to three English specialists, who validated its face and content validity. The test's reliability was computed applying the KR-21 formula (0.87).

The last tool was a post-test of vocabulary which was essentially the same pre-test described above with slight alterations to counteract the influence of memory in terms of the time period between the pre- and post-tests. The vocabulary post-test included the same aspects as the vocabulary pre-test, including the contents of the items and the quantity of items. The researcher just altered the language and sequence of the items and alternatives such that the difficulty level of the two exams did not vary. To guarantee this, both pre- and post-tests were piloted on a small independent sample of people with the same proficiency level and were determined to be similar, with difficulty indices of 0.42 and 43, respectively. The validity of the post-test was further proven by English specialists, who stated that because the exam assessed what it was designed to measure, the test is valid. Finally, utilizing the KR-21 formula, the post-test reliability was calculated to be $r = 0.85$.

Procedures for collecting data

To conduct the investigation, first, the NELT was administered to 89 EFL learners so as to manifest their homogenous levels concerning English language ability. Then, 58 intermediate pupils were selected for the target sample of the current research. Next, they were assigned to two classes of control and experimental, and a vocabulary pretest was given to them. After that, the EG received a CALL-based assessment treatment, and the CG received a traditional-based assessment instruction. In each session, 10 new words were trained each group. The words were instructed to the EG via WhatsApp application as a kind of CALL-based instruction. Each session lasted 50 min; the teacher (researcher) sent 10 words on WhatsApp application and required them to practice them with their classmates. If they could not find the meanings or definitions of the words, the teacher herself helped them and provided the meanings of the words. When

all meanings and definitions of the words were provided, the teacher sent some related vocabulary practices to involve students more in vocabulary learning. At the beginning of the new session, a vocabulary quiz was given to the students to measure their vocabulary development and also to encourage them practice new words.

On the other side, the words were trained to the CG traditionally in a real face-to-face classroom. The teacher attended a real class personally and taught 10 words to the CG in each week using pen and paper. The Persian equivalents of the words were provided for the students, and some related vocabulary practices were worked in the classroom. A quiz in the form of pen/paper was administered to the CG at the outset of each new session. Totally, 100 words were trained to both groups. After teaching all words, a vocabulary post-test was administered to the two classes to measure the usefulness of the intervention on their vocabulary learning enhancement.

Analyzing the data

After the data was collected, it was analyzed using the Statistical Package for Social Sciences (SPSS) software, version 26. After ensuring that the data were normal using the Kolmogorov–Smirnov test, a paired samples *t*-test and an ANCOVA test were used to assess the influences of the treatment on the vocabulary knowledge of Iranian EFL students.

Results

When the data were gathered via the stated instruments, we did analysis on them to obtain the ultimate findings. The following tables present the results' details (Table 1).

As all sig. (2-tailed) values are above 0.05, we can conclude that the data distribution on both vocabulary pre-test and post-test is normal. Accordingly, the parametric statistics are used to analyze the data.

On the vocabulary post-test, the conventional group scored 15.25, whereas the CALL group scored 17.28, as shown in Table 2. The two groups appear to have performed differently in the post-test. Based on the mean results, it appears that the CALL group outstripped the conventional group on the vocabulary post-test.

Table 1 K-S test for normality distribution

		Conventional pre	Conventional post	CALL pre	CALL post
N		28	28	28	28
Normal parameters	Mean	13.53	15.25	13.96	17.28
	Std. deviation	2.57	3.15	2.51	2.08
Most extreme differences	Absolute	0.15	0.13	0.18	0.16
	Positive	0.15	.09	0.18	0.11
	Negative	− 0.12	− 0.13	− .08	− 0.16
Test statistic		0.15	0.13	0.18	0.16
Asymp. sig. (2-tailed)		.08	0.17	0.15	.06

Table 2 The vocabulary post-test results (descriptive statistics)

Group	Mean	Std. deviation	N
Conventional	15.25	3.15	28
CALL	17.28	2.08	28
Total	16.26	2.84	56

Table 3 The vocabulary post-test results (inferential statistics)

Source	Type 3 sum of squares	Df	Mean square	F	Sig
Corrected model	80.41a	2	40.20	5.84	.00
Intercept	293.03	1	293.03	42.60	.00
PRE	22.40	1	22.40	3.25	.03
Group	51.62	1	51.62	7.50	.00
Error	364.56	53	6.87		
Total	15,265.00	56			
Corrected total	444.98	55			

Table 4 Paired samples inferential statistics of pre- and post-tests of each group

		Paired Differences						*t*	df	Sig. (2-tailed)
		Mean	Std. deviation	Std. error mean	95% confidence interval of the difference					
					Lower	Upper				
Pair 1	Conventional pre/post	− 1.71	3.44	0.65	− 3.04	− 0.37		− 2.63	27	.01
Pair 2	CALL pre/post	− 3.32	2.98	0.56	− 4.47	− 2.16		− 5.89	27	.00

According to the inferential results shown in Table 3, the CALL group outperformed the conventional group on the vocabulary post-test since sig. 0.00 is smaller than 0.05. This improvement can be attributed to the CALL-based instruction that this group got (Table 4).

A paired samples *t*-test was done to see if the conventional group or CG improved on their post-test, and the results show that there is a difference between the performances of this group before and after the treatment. We may conclude that this group improved in their vocabulary post-test. Similarly, the results of the second paired samples *t*-test reveal that the CALL group or EG improved on their vocabulary post-test since sig (0.00) was less than 0.05.

In a nutshell, the results show that both CALL-based and traditional assessments generated positive effects on promoting vocabulary learning among Iranian EFL learners. It should be noted that the results demonstrate that the CALL-based assessment was more effective than the traditional assessment for enhancing the vocabulary learning of EFL students.

Discussion

We employed the ANCOVA test and the paired samples *t*-test to address the research's questions. The findings demonstrated that EG learners that were given teaching via CALL performed better in their vocabulary posttest than the CG. The gained results showed that in the vocabulary posttest, the EG outstripped the CG. The outcomes of this study are supported by Kiliçkaya and Seferolu (2013) who evaluated the influence of CALL instruction on the utilization of CALL-centered tasks in the classrooms of in-service language instructors. Their results demonstrated that CALL training assisted the participants in incorporating a range of CALL-oriented contents and tools into their classroom practices. Moreover, the gained results lend support to Khoshsima and Mozakka (2017) who explore and confirmed the positive effects of CALL as a method of learning and teaching a foreign language on listening capability enhancement.

Additionally, our findings are endorsed by Enayati and Pourhosein Gilakjani (2020) who explored the impact of CALL on the vocabulary development of EFL intermediate pupils. Their findings revealed that the EG outperformed the CG on the vocabulary posttest. Furthermore, our outcomes are similar to the findings of Emami and Amirghasemi (2022) who investigated the influence of CALL on students' vocabulary development. Their findings revealed that this strategy might positively improve the vocabulary learning of the EG participants. Akmak et al. (2021) investigation into the impact of employing a CALL-based vocabulary application on students' L2 vocabulary enhancement also supports the outcomes of the existing research. Based on their findings, the EG outstripped the CG on the vocabulary posttest.

Additionally, our findings are in agreement with Chapelle and Voss (2016) who discovered that online assessment as a kind of CALL-based assessment created a more relaxed and less stressful testing environment for language learners. Furthermore, Chen and Wang (2018) who indicated that there were differences between the effects of online and offline assessment on language learners' motivation and engagement confirmed our results. Besides, the results of this research are indorsed by Brown and Lee (2015) who verified the effects of CALL-based assessment on EFL learners' language achievement. They stated that that online assessment positively influenced language achievement by providing more opportunities for practice and feedback.

The findings of this study are consistent with Harasim's (2012) theory of online collaborative learning, which established the benefits of using CALL and online instruction in learning a language. According to the hypothesis, students may work together to resolve their problems, which can enhance their ability to learn English. Online collaborative learning focuses on the facilities of the Internet to provide learning environments that foster collaboration and knowledge building. Additionally, Siemens' (2005) connectivism hypothesis, which claims that learners know when utilize online teaching and make connections with their peers, supports our findings. Moreover, our outcomes are indorsed by the social constructivism theory explaining that teaching and learning as complex interactive social phenomena between teachers and students. Based on this theory, the teachers provide a social situation in which the learners can assemble or construct with others the knowledge necessary to solve the problems. According to this assumption, learning is a series of practical social experiences in which students learn by doing, collaborating, and reflecting with others.

The new study's findings are consistent with a number of other investigations. According to studies like those conducted by Abbasi and Hashemi (2013), Naraghizadeh and Barimani (2013), Thornton and Houser (2003), and Thornton and Houser (2005), using technology like a CALL application helps students learn vocabulary. For instance, Abbasi and Hashemi (2013) examined the effect of using a mobile phone on English language vocabulary retention and discovered that the students' vocabulary learning was positively impacted. In their studies from 2003 and 2005, Thornton and Houser examined the usage of mobile phones in English instruction in Japan. The findings showed that pupils who used SMS in their learning process fared better on average than those who received their instruction on paper. In this regard, Naraghizadeh and Barimani (2013) investigated the impact of CALL on the vocabulary acquisition of Iranian EFL learners. The study's findings showed a substantial difference between the experimental and control groups in terms of vocabulary knowledge. In other words, CALL education increased the vocabulary of EFL learners. Additionally, the outcomes demonstrated that the study's CALL-based instruction group outperformed the other groups.

Since online learning might be appealing to EFL students, it is possible that online teaching contributed to the vocabulary growth of Iranian EFL students in the posttests. According to Gilbert (2015), online education is popular with many students and is getting increasingly prevalent in situations ranging from rudimentary schools to advanced schools and postsecondary institutions. Different student groups find online teaching appealing and beneficial in situations when traditional training falls short or is unable to suit their needs. The drive "to deliver quality instruction to all learners irrespective of situation or time" is what spurred the demand for online instruction (Chaney, 2010, p. 21).

Online instruction is a learner-oriented learning method which allows pupils to exchange knowledge outside of the classroom without consideration of time or location restrictions. This strategy, which mixes self-study with asynchronous engagement to enhance learning, can be applied in conventional on-campus instruction as well as remote learning and continuing education. Online education gives students more freedom to complete their process of learning without being constrained by time or physical area (Ge, 2011).

Digital assessment tools are frequently enhanced with interactive aspects to make them more interesting, such as multimedia information, gasification components, immersive experiences like interactive quizzes, timed tasks, and others. Online progress monitors for students and other real-time data, including time spent, grades, and areas for growth, are features of online examinations that teachers can access. These cutting-edge reports assist teachers in giving thorough direction and modifying their lesson plans to meet the needs of each student. To assist students with special needs, online tests can be made available with text-to-speech capabilities, scalable fonts, or alternative formats. Digital tools for assessment can have an initial investment, but they can significantly reduce assessment costs in the long run.

Online examinations also offer the simplicity and efficiency needed in today's changing economy. Without being restricted by time or place, the students can complete evaluation assessments at their own pace and on their own schedule. Additionally, teachers may simply keep track of student progress, create tests, and quickly

mark quizzes and other assessments by using digital eLearning assessment tools. As a result, assessments are made to meet the demands of the teachers and pupils. The flexibility and ease of online examinations are their main advantages. For the majority of students, the evaluation is perfect because it can be finished at any time and from any location utilizing digital devices. This makes education more individualized and takes into account different timetables and learning requirements (Noorbehbahani et al., 2022).

Some advantages of online can be used to explain why the online group performed better than the offline group. Online tests can aid instructors in checking the correctness of the responses and delivering answers in real time in less time. Online assessment tests are essential to the success of eLearning, and it is obvious that they have several advantages over offline mode. However, given that most education nowadays is self-paced and tailored to the individual needs of students, evaluations likewise need to be dynamic, individualized, and perfect to fit their needs (Helfaya, 2019).

The usage of online education can be appealing to students because it allows them to participate in learning outside the classroom, fosters cooperative learning among pupils, promotes self-study among learners, and increases their self-confidence. The reality that the EG outstripped the CG may be attributable to these aspects of online training. Some students may feel nervous when they are learning a foreign language in a face-to-face fashion since they do not like to face the teacher directly. Therefore, using online learning may reduce their learning anxiety.

The flexibility of online learning allows students to study when and where it is most convenient for them. As a result, the kids' linguistic anxiety can be decreased. Websites for learning the English language online, digital dictionaries, conversation and e-mail programs, presentation software, online games, and online means are just a few examples of online resources that may be useful learning aids (Wood, 2001; Wu et al., 2011; Zarei & Mahmoodzadeh, 2014). These resources can make learning easier by motivating students to concentrate on new words and their context-specific uses.

Additionally, the characteristics of CALL-based instruction, which adheres to practices that hold students accountable for their own learning autonomously prior to going to the real class sessions via practicing contents and conversing in the groups social networking, can be credited with the results attained. Additionally, utilizing CALL-based teaching can free up educational time and clear the way for engaging learning tasks that boost learners' communication skills.

One other reason for the results of this study is the fact that online learning can save a large amount of money, time, and energy. Through online learning, students do not have to use public transportation, and saving fuel costs can be substantial if they do not have to commute. Students in virtual universities do not have to manage travel and transportation issues because online classes may be taken from the convenience of one's own home.

The other justification for the results of this study can be due to fact that online learning paves the way for the students to continue education and do their career at the same time. Students can have their full-time job while educating. In addition, by using online learning, students have freedom to learn at their own convenience, and they can easily access the curriculum from the comfort of their home.

"Time availability" is another argument that may be made, and it is a component that should be taken into consideration when speaking online. It implies that the timing of online classes is up to the teachers and students, giving both groups of people freedom. Another situation involving chat time is that participants have greater time and opportunities to amend, for example, their typed messages, when they make a mistake. Additionally, they can revisit the conversations and corrective comments made at a later time. However, if they receive traditional written corrections, they are not given access to the corrective feedback given to other students as they would in online sessions. Another element that makes online sessions more interesting is the participants' anonymity. Participants can rehearse and test what they have lately learnt while using other names for them, making mistakes without embarrassment. When the instructor corrects them, they are not stressed out either. We should concur with the findings and respond positively to the study's second and third questions regarding the value of providing corrective feedback, whether through traditional methods or online sessions.

One of the most significant facilities of online learning is the recording of all online classes and presenting to the students. Some students might miss the fortune to be online in the special time or might not fully understand the lecture; they can easily use the recorded of the classes for several times in order to learn effectively, while in traditional learning, students can only benefit the classroom once, and they do not have the second chance in their absence.

People today, especially students, are used to communicating online for many kinds of purposes. Such people have a number of options, thanks to this way of communication, including the ability to be anonymous, unhurried and less stressed, open to dialogue with strangers, and the freedom to express their questions clearly and openly. Online chatting appears to be interesting in contrast to face-to-face interaction or even traditional error correction, which is dull and out of date for the current generation of students and language learners. This applies generally to EFL students as well. Iranian EFL students appear to like studying their subjects through interactions in online classes, which makes sense given the current state of teaching and learning in Iran.

There is no denying the appeal of online communication and chat through CALL, particularly for the younger population and in particular language learners who desire everything to be simple and convenient. Nowadays, the majority of instruction and learning takes place online, which has an impact on and has already had an impact on the TEFL profession. For the convenience of both teachers and students, asking questions and distributing assignments are done online as well. The majority of communication between educators and learners occurs online.

The positive features mentioned above for online learning can be the reasons why the EG outperformed the CG on the posttest. The results of the current study are in line with other studies such as Rhema and Miliszewska (2014), Pilli, Fanaeian, and Al-Momani (2014), Liaw and Huang (2011), and Yaghoubi et al. (2008) who announced the positive effects of online learning on language learning development.

The advantages of CALL learning settings can also be used to support the findings of the current study. Since they have access to various online resources and more opportunities to communicate because CALL can offer a diverse and high-quality learning experience, students in CALL learning environments are actively engaged in

the learning process, which can aid in the development of vocabulary in the classroom (Lim et al., 2019). The tasks practised in the CALL environment were genuinely expected to foster higher mental processes like problem-solving, logical speech, planning, and evaluation in the current study, in accordance with Vygotskyan (1978) theories.

There were a number of elements in the CALL-based environment used in the current study that appeared to support learners' vocabulary growth. The CALL environment, in the first place, might assist researchers and teachers in choosing from a variety of tasks in the multimodal settings of CALL-based classes. Second, the teachers used a multimodal approach, which, as Hampel (2006) has shown, promotes the use of oral/communicative language in a CALL context. According to Müller-Hartmann and Ditfurth (2010), the multimodal CALL environment can also give teachers and students a richer context to negotiate tasks, which can improve motivation and performance. They argued that tasks as processes could better be monitored in a CALL environment, and further task support could be provided as multiple modes are available. Finally, in CALL-oriented setting, scaffolding is of prime significance. Considering the sort of interaction among learners, instructors, and computer in the current study, it can be stated that there exist a kind of triadic interaction or triadic scaffold (Meskill, 2005).

The triadic scaffolds, thus, comprised the instructor's role as a capable peer providing feedbacks, contribution of computer as an authentic means of receiving guided feedbacks, and learners' role in using strategic planning and their accomplishment in the interaction. According to Meskill (2005), functions and forms of triadic scaffold (instructor, learners, and computer) are considered for their potential unique role in second language and literacy instructions. In the current study, the teachers mainly provided both technical and task support to help learners pursue their collaborative-communicative tasks independently.

This left enough space for learners to scaffold each other more, and this way, they expected less task monitoring from the teachers. This is in line with Al-Kahtani and Al-Haider (2010) and Virdaus (2018). They argued that teachers' support could help revive communication, and the more communication is conducted by the learners, the less monitoring is required from the teachers. Considering the role of computer as an authentic means of interaction in triadic scaffold, conducted researches have revealed that using computer motivates learners and anchors learners' attention (Esfandiari Dehmajnoni & Amjadiparvar, 2022).

Hegelheimer and Tower (2004) also claimed that CALL offers an ideal medium for interaction in an authentic way, and using computer provides unique learning opportunities for meaningful language use (Van Lier, 2002). Moreover, it has been observed that interaction in a context that utilizes computer creates unique learning, and the type of language produced there is linguistically different from the produced language in more traditional contexts (Meskill, 2005). Mokhtari (2013) suggested that students in general have positive attitude toward the integration of CALL into their language learning course, and this will lead to increasing their tendency to communicate. As suggested by Lim et al. (2019), language learning and literacy context that provide and sustain the social construction and negotiation of meaning-making are highly considered as optimal.

This research has some shortcomings. One of them was the relatively modest number of disciplines offered as a result of the difficulty in making courses accessible to students. As a result, it is important to carefully consider the participants' representativeness. Next investigations can be conducted on students at tertiary level; the present one was done at a private language institution. Next researches are highly encouraged to employ different instruments, including interview and attitude surveys, to gather more precise data about the impact of CALL-based training on language learning. We might research how CALL-based assessment affects vocabulary learning; further studies could look into how CALL-based assessment affects other language abilities and sub-skills.

Conclusions and implications

The application of CALL-based education can have a constructive effect on vocabulary development of EFL students in Iran, according to the study's findings. We may conclude that online training is an essential tool that must be used to support face-to-face EFL instruction. It includes a variety of assignments and tools that, when used by students under the guidance of teachers, can enhance their language proficiency. We should employ technology and coordinate ourselves with the expanding universe. Additionally, it may be inferred that a variety of online tools can have a significant influence on how well students acquire different facets of language.

It can be concluded that different online tools may have differential effects on the learning of the different aspects of language. This implies that adhering to any single online tool may not necessarily bring about desirable results. Due to the fact that not all Iranian institutions and schools have access to cellphones, tablets, or laptops, and because in certain areas the Internet speed is slow, hybrid programs that combine online learning and in-person education are suggested to be used in Iranian settings.

There is no doubt that technology has a positive impact on the education industry. Teaching and evaluating pupils are two tasks that should not be restricted to the four walls of a classroom and can both be carried out whenever and wherever with the help of computers and the Internet. It has been observed that students feel anxious and stressed out while waiting for the exam results. However, this is not the case with an online exam because the results are released right away, relieving the worry and anxiety of the pupils.

Giving feedback soon after a work is finished helps a student or individual use it more effectively. This not only enables the learner to assess their level of performance but also to take better actions for the outcome optimization. The student can design their course load strategically and concentrate more on one subject. A person can also know in advance which subject they should pay closer attention to.

The findings of this study may have some effects on students and teachers. Embarrassed students can use CALL to lessen their fear anytime they wish to speak English and lessen their humiliation in face-to-face lessons. Classes that were formerly teacher centered are now more student centered, thanks to CALL. Applying CALL enables students to actively learn at any time, before and after lectures. CALL promotes collaborative group work and integrates continual conceptual understanding assessments to provide feedback to both instructors and learners.

The findings of this investigation may be applied by language learners to study whenever and wherever they choose. Traditionally, students must show up for class at a set

time and location. However, if these locations have computers and the Internet, students may study and learn the same topics from any location. If their personal computers are connected to the network or system at their schools, pupils can even continue studying outside of the classroom. Students can engage in a variety of entertaining games and conversational activities through the use of CALL, helping to reduce their anxiety and tension correlated to studying.

The outcomes of this research are useful to instructors because they highlight the significance of incorporating CALL in their lessons to assist students overcome their nervousness and boost their willingness to learn languages. Both teachers and pupils should have some level of online media competence in order for CALL to be effectively incorporated into language programs. These results suggest that teachers must first get familiar with online instruction tools and set aside time in the classroom to instruct pupils in these strategies.

Depending on the goal of the lesson, instructors can also promote the usage of more efficient and productive online instruments while discouraging the use of ineffective or counterproductive ones. The results of this study have implications on how to enhance teacher-student communication. Online instruction, in contrast to traditional second language classrooms, allows students to study more independently, giving teachers more time to concentrate on aspects of foreign language instruction that are still challenging or difficult to teach using computer (AbuSeileek, 2012). This tailored instruction can foster dynamic learning, improve understanding of what is being learned, and enable students to track their own development.

The outcomes of this investigation can assist syllabus designers to comprehend the value of online resources for learning the English language. Designers of course materials ought to stress the use of Internet resources for language acquisition. Furthermore, people who are eager to perform study in the field of CALL may find that this examination broadens their perspectives. In other words, the investigation's results may open doors for later scholars. This study may be beneficial to anyone who teach and learn foreign languages, particularly EFL instructors and students. The findings of the current study can offer complete direction to curriculum designers who believe in technology, making it important to assess how well a new technology is taught in relation to the process of learning a new language.

Lastly, CALL-based testing and evaluations are advantageous for those with special needs as well. Effective strategies have been devised, such as allowing pupils to enter their responses by merely touching the screen rather of writing them down. Another excellent choice and excellent remedy for those who struggle with essay writing are speech to text.

Abbreviations
CALL	Computer-assisted language learning
EFL	English as a foreign language
EG	Experimental group
ANCOVA	Analysis of covariance
CG	Control group
NELT	Nelson English Language Test
SPSS	Statistical Package for Social Sciences

References

Abbasi, M., & Hashemi, M. (2013). The impact/s of using mobile phone on English language vocabulary retention. *International Research Journal of Applied and Basic Sciences,4*(3), 541–547. Retrieved from http://www.irjabs.com/files_site/paperlist/r_710_130328101509.p.

Abduh, M. Y. M. (2021). EFL teachers' online assessment practices during the COVID-19 pandemic: Changes and mediating factors. *Asian EFL Journal,28*(1.1), 26–46. https://doi.org/10.1007/s40299-021-00589-3

AbuSeileek, A. F. (2012). Computer-assisted language learning: Merits and demerits. *Language in India,12*(4), 23–36. doi: 12.1177/0031512519864489

Adam, M. A. A. (2016). *Role of vocabulary learning strategies in promoting EFL learners' performance.* Sudan University of Science and Technology.

Alderson, C., & Banerjee, J. (2001). Language testing and assessment. *Language Teaching,34*(4), 213–236. https://doi.org/10.1017/S0261444800014464

Aldosari, M., Heydarnejad, T., Hashemifardnia, A., & Abdalgane, M. (2023). The interplay among self-assessment, using refection for assessment, classroom enjoyment, and immunity: Into prospects of effective language learning. *Language Testing in Asia, 13*(1). https://doi.org/10.1186/s40468-022-00213-1

Alias, M., Masek, A., & Salleh, H. H. M. (2015). Self, peer, and teacher assessments in problem-based learning: Are they in agreements? *Procedia-Social and Behavioral Sciences,204*, 309–317. http://creativecommons.org/licenses/by-nc-nd/4.0/.

Al-Kahtani, S., & Al-Haider, S. (2010). Factors affecting the use of CALL by EFL female faculty members in Saudi higher education: Current status. *Jalt Call Journal,6*(3), 153–170. https://doi.org/10.1016/j.jksult.2011.04.004

Al-Mansour, N. S., & Al-Shorman, R. A. (2012). The effect of computer assisted-instruction on Saudi university students' learning of English. *Journal of King Saud University-Languages and Translation,24*(1), 51–56. https://doi.org/10.1016/j.jksult.2009.10.001

Alotumi, M. (2018). The effect of CALL-based instruction on students' score attainment on the TOEFL iBT in a Yemeni context. *International Journal of Computer-Assisted Language Learning and Teaching,8*(1), 50–62. https://doi.org/v:8:y:2018:i:1:p:50-64

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *International Review of Research in Open and Distance Learning, 12*(3). Retrieved 2 March, 2014, from, http://www.irrodl.org/index.php/irrodl/article/view/890/1663

Ashraf, H., & Mahdinezhad, M. (2015). The role of peer-assessment versus self-assessment in prompting autonomy in language use: A case of EFL learners. *Iranian Journal of Language Testing,5*(2), 110–120. Retrieved from: http://weaeducation.typepad.co.uk/files/blackbox-1.pdf.

Baniabdelrahman, A. (2010). The effect of the use of self-assessments' performance in reading comprehension in English. *The Electronic Journal for English as a Second Language,14*(2), 147–156. https://doi.org/804f52a40a933f04

Bani Hani, N. (2009). *Designing an English computerized instructional program for Jordanian sixth grade students and measuring its effect on their achievement.* Unpublished Doctoral Dissertation, Yarmouk University, Irbid, Jordan.

Bani Hani, N. (2014). Benefits and barriers of computer assisted language learning and teaching in the Arab world: Jordan as a model. *Theory and Practice in Language Studies,4*(8), 1609–1615. https://doi.org/10.4304/tpls.4.8.1609-1615

Baş, G. (2010). Evaluation of DynED courses used in elementary schools from the views of teachers in Turkey. *Journal of Language and Linguistic Studies,6*(1), 0–39. Retrieved from https://dergipark.org.tr/en/pub/jlls/issue/9931/122861

Brown, H. D., & Abeywickrama, P. (2010). *Language assessment: Principles and classroom practices* (2nd ed.). Pearson education.

Brown, J. D., & Hudson, T. (1998). The alternatives in language assessment. *TESOL Quarterly,32*(4), 653–675. https://doi.org/10.2307/3587999

Brown, H. D., & Lee, H. (2015). The effects of online and offline assessment on willingness to communicate in a second language. *Language Teaching Research,19*(3), 279–297. https://doi.org/10.1177/0031512519864478

Chaney, E. G. (2010). Web-based instruction in a rural high school: A collaborative inquiry into its effectiveness and desirability. *NASSP Bulletin,85*(628), 20–35. https://doi.org/10.1177/019263650108562803

Chapelle, C. A., & Voss, E. (2016). The effects of online and offline assessment on test taking anxiety in language learners. *Language Testing,33*(2), 169–191. Retrieved from https://ejournals.bc.edu/index.php/jtla/article/view/1648.

Chen, L., & Wang, Y. (2018). Willingness to communicate in online and offline assessment contexts. *System,76*, 1–10. DOR: 20.1001.1.4763187.2021.10.2.6.3.

Chen, Z., Jiao, J., & Hu, K. (2021). Formative assessment as an online instruction intervention: Student engagement, outcomes, and perceptions. *International Journal of Distance Education Technologies,19*(1), 50–65. https://doi.org/10.4018/IJDET.20210101.oa1

Cheng, W., & Warren, M. (2005). Peer assessment of language proficiency. *Language Testing,22*(1), 93–121. https://doi.org/10.1191/0265532205lt298oa

Çakmak, F., Namaziandost, E., & Kumar, T. (2021). CALL-enhanced L2 vocabulary learning: Using spaced exposure through CALL to enhance L2 vocabulary retention. *Education Research International,2*, 1–8. https://doi.org/10.1155/2021/5848525

Davies, G. (2002). ICT and modern foreign languages: Learning opportunities and training needs. International Journal of English Studies,*2*(l), 1–18. Retrieved from https://revistas.um.es/ijes/article/view/48371

Dilek, Y., & Yuruk, N. (2013). Using semantic mapping technique in vocabulary teaching at pre-intermediate level. *Procedia - Social and Behavioral Sciences,70*, 1531–1544. https://doi.org/10.1016/j.sbspro.2013.01.221

Emami, A., & Amirghasemi, A. (2022). The effect of CALL on the vocabulary learning of Iranian pre-intermediate EFL learner. *Journal of Applied Linguistics Studies,1*(1), 70–88. https://jals.aliabad.iau.ir.

Enayati, F., & PourhoseinGilakjani, A. (2020). The impact of computer assisted language learning on improving intermediate EFL learners' vocabulary learning. *International Journal of Language Education,4*(1), 96–112. https://doi.org/10.26858/ijole.v4i2.10560

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development,53*(4), 25–39. https://doi.org/10.1007/BF02504683

Esfandiari Dehmajnoni, H., & Amjadiparvar, A. (2022). The effect of online planning and strategic planning in CALL-based TBLT on Iranian EFL learners' willingness to communicate. *Scientific Quarterly Journal of Language Horizons, Alzahra University,6*(3), 115–135. https://doi.org/10.22051/lghor.2021.35449.1461

Fitriyah, I., & Jannah, M. (2021). Online assessment effect in EFL classroom: An investigation on students and teachers' perceptions. *Indonesian Journal of English Language Teaching and Applied Linguistics,5*(2), 265–284. https://doi.org/10.21093/ijeltal.v5i2.709

Ge, Z. G. (2011). Exploring e-learners' perceptions of net-based peer-reviewed English writing. *International Journal of Computer-Supported Collaborative Learning,6*(1), 75–91. https://doi.org/10.33736/jcshd.511.2017

Gilbert, B. (2015). Online learning revealing the benefits and challenges. *International Journal of Education and Research,3*(5), 29–38. Retrived from https://fisherpub.sjf.edu/education_ETD_masters.

Grenner, C. (2019). The effect of the use of CALL on pupils' motivation and language development in English. *Journal of Educational Media,6*(3), 1–25. https://doi.org/150807087

Gündüz, N. (2005). Computer assisted language learning. *Dil Ve Dilbilimi Çalışmaları Dergisi,1*(2), 193–214. https://doi.org/10.33448/rsd-v8i10.1413

Hampel, R. (2006). Rethinking task design for the digital age: A framework for language teaching and learning in a synchronous online environment. *ReCALL,18*(1), 105–121. https://doi.org/10.1017/S0958344006000711

Hanafiah, W., Aswad, M., Sahib, H., Hakim Yassi, A., & Mousavi, M. (2022). The impact of CALL on vocabulary learning, speaking skill, and foreign language speaking anxiety: The case study of Indonesian EFL learners. *Education Research International,2*, 1–13. https://doi.org/10.1155/2022/5500077

Harasim, L. (2012). *Learning theory and online technologies*. Routledge/Taylor and Francis.

Hashemifardnia, A., Shafiee, S., RahimiEsfahani, F., & Sepehri, M. (2021). Effects of massive open online course (MOOC) on Iranian EFL learners' speaking complexity, accuracy, and fluency. *CALL-EJ,22*(1), 56–79. https://doi.org/10.3389/fpsyg.2022.833616

Hazaea, A. N., & Alzubi, A. A. (2016). The effectiveness of using mobile on EFL learners' reading practices in Najran University. *English Language Teaching,9*(5), 8–21. https://doi.org/10.5539/elt.v9n5p8

Hegelheimer, V., & Tower, D. (2004). Using CALL in the classroom: Analyzing student interactions in an authentic classroom. *System,32*(2), 185–205. https://doi.org/10.1016/j.system.2003.11.007

Heil, J., & Ifenthaler, D. (2023). Online assessment in higher education: A systematic review. *Online Learning,27*(1), 187–218. https://doi.org/10.24059/olj.v27i1.3398

Helfaya, A. (2019). Assessing the use of computer-based assessment-feedback in teaching digital accountants. *Accounting Education, Taylor and Francis,28*(1), 69–99. https://doi.org/10.1080/09639284.2018.1501716

Heritage, M. (2012). From formative assessment: Improving teaching and learning. *Paper presented at the CRESST 2007 Assessment Conference, Los Angeles, CA.*

Kesima, R., & Altınpulluka, H. (2015). A theoretical analysis of MOOCs types from a perspective of learning theories. *Procedia - Social and Behavioural Sciences,186*, 15–19. https://doi.org/10.1016/j.sbspro.2015.04.056

Khoshsima, H., & Mozakka, Z. (2017). The effect of computer-assisted language learning on Iranian upper-intermediate EFL learners' listening skill. *Journal of Applied Linguistics and Language Research,4*(2), 81–91. https://doi.org/11.1016/j.2017.08.089

Kilickaya, F., & Krajka, J. (2010). Comparative usefulness of online and traditional vocabulary learning. *The Turkish Online Journal of Educational Technology,9*(2), 55–63. Retrived from http://www.jalt-publications.org/tlt/files/98/mar/carrell.html.

Kiliçkaya, F., & Seferolu, G. (2013). The impact of CALL instruction on English language teachers' use of technology in language teaching. *Journal of Second and Multiple Language Acquisition– JSMULA,1*(1), 20–38. Retrieved from http://www.eric.ed.gov/PDFS/EJ811128.pdf.

Kop, R. (2011). The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course. *International Review of Research in Open and Distance Learning, 12*(3), Retrieved 15 April, 2014, from, http://www.irrodl.org/index.php/irrodl/article/view/882/1823

Lee, E., & Hannafin, M. (2016). A design framework for enhancing engagement in student-centered learning: Own it, learn it, and share it. *Educational Technology Research and Development,64*, 707–734. https://doi.org/10.1007/s11423-015-9422-5

Lee, K. W. (2000). English teachers' barriers to the use of computer-assisted language learning. *Internet TESOL Journal,6*(12), 56–73. Retrieved from http://iteslj.org/.

Levy, M. (1997). *Computer assisted language learning: Context and conceptualization*. Clarendon Press.

Li, G. (2017). A study on the blended-teaching mode combining MOOCs and flipping classroom in college English teaching. *Advances in Computer Science Research (ACSR),76*, 1272–1278. Retrieved from http://creativecommons.org/licenses/by-nc/4.0/.

Li, H., Bialo, J., Xiong, Y., Vincent Hunter, C., & Guo, X. (2021). The effect of peer assessment on non-cognitive outcomes: A meta-analysis. *Applied Measurement in Education*. https://doi.org/10.1080/08957347.2021.1933980

Liaw, S. S., & Huang, H. M. (2011). A study of investigating learners' attitudes toward e-learning. *2011 5th International Conference on Distance Learning and Education.*

Lim, D. H., Morris, M. L., & Kupritz, V. W. (2019). Online vs. blended learning: Differences in instructional outcomes and learner satisfaction. *Journal of Asynchronous Learning Networks,11*(2), 27–42. https://doi.org/10.4236/ce.2019.107122

Macis, M., & Schmitt, N. (2017). Not just 'small potatoes': Knowledge of the idiomatic meanings of collocations. *Language Teaching Research,21*(3), 321–340.

Meskill, C. (2005). Triadic scaffolds: Tools for teaching English language learners with computers. *Language Learning and Technology,9*(1), 46–59. http://llt.msu.edu/vol9num1/meskill. Doi 804f68f8c8e33f78.

Mokhtari, H. (2013). Iranian EFL learners' attitude towards CALL. *Procedia - Social and Behavioral Sciences,70*, 1630–1635. https://doi.org/10.1016/j.sbspro.2013.01.232

Mousavi, S. A. (2012). *An encyclopedic dictionary of language testing*. Rahnama Press.

Müller-Hartmann, A., & Ditfurth, M. S. V. (2010). Research on the use of technology in task-based language teaching. In M. Thomas & H. Reinders (Eds.), *Task-based language learning and teaching with technology* (1st ed., pp. 17–40). Bloomsbury Academic. https://doi.org/10.3726/978-3-653-01062-6/2

Nachoua, H. (2012). Computer-Assisted language learning for improving students' listening skill. *Procedia - Social and Behavioral Sciences,69*, 1150–1159. https://doi.org/10.1177/1362168816645957

Namaziandost, E., & Heydarnejad, T. (2023). Mapping the association between productive immunity, emotion regulation, resilience, and autonomy in higher education. *Asian-Pacific Journal of Second and Foreign Language Education,8*, 33. https://doi.org/10.1186/s40862-023-00207-3

Namaziandost, E., Heydarnejad, T., & Azizi, Z. (2023). To be a language learner or not to be? The interplay among academic resilience, critical thinking, academic emotion regulation, academic self-esteem, and academic demotivation. *Current Psychology,42*, 17147–17162. https://doi.org/10.1007/s12144-023-04676-0

Naraghizadeh, M., & Barimani, S. H. (2013). The effect of CALL on the vocabulary learning of Iranian EFL learners. *Journal of Academic and Applied Studies,3*(8), 1–12. Retrieved fromhttps://www.academia.edu/10432058/.l.

Noorbehbahani, F., Mohammadi, A., & Aminazadeh, M. (2022). *A systematic review of research on cheating in online exams from 2010 to 2021*. Education and Information Technologies. https://doi.org/10.1007/s10639-022-10927–7

Obari, H., & Lambacher, S. (2015). Successful EFL teaching using mobile technologies in a flipped classroom. *In Critical CALL–Proceedings of the 2015 EUROCALL Conference, Padova, Italy* (pp. 433–438). Research-publishing. net.

Pilli, O., Fanaeian, Y., & Al-Momani, M. M. (2014). Investigating the students' attitude toward the use of e-learning in Girne American University. *International Journal of Business and Social Science,5*(5), 169–175. Retrived from www.ijbssnet.com.

Popham, W. J. (2008). *Classroom assessment: What teachers need to know* (5th ed.). Prentice Hall.

Prensky, M. (2000). *Digital game-based learning*. McGraw-Hill.

Ratnaningsih, D., Nofandi, F., Purba, D., & Wiratno, M. D. (2019). The influence of computer assisted language learning (Call) to improve English speaking skills. *Research Society and Development,8*(10), e438101413. https://doi.org/10.33448/rsd-v8i10.1413

Rezai, A., Namaziandost, E., Miri, M., & Kumar, T. (2022). Demographic biases and assessment fairness in classroom: Insights from Iranian University teachers. *Language Testing in Asia,12*(1), 1–20. https://doi.org/10.1186/s40468-022-00157-6

Rhema, A., & Miliszewska, I. (2014). Analysis of student attitudes towards e-learning: The case of engineering students in Libya. *Issues in Informing Science and Information Technology,11*, 169–190. Retrieved from http://iisit.org/Vol11/IISITv11p169-190Rhema0471.pdf.

Robinowitz, A. (2010). From principles to practice: An embedded assessment system. *Applied Measurement in Education,13*(2), 181–208. https://doi.org/10.1207/S15324818AME1302_4

Schmitt, N. (2008). Instructed second language vocabulary learning. *Language Teaching Research,12*(3), 329–363. https://doi.org/10.1177/1362168808089921

Schumacher, C., & Ifenthaler, D. (2021). Investigating prompts for supporting students' selfregulation—A remaining challenge for learning analytics approaches? *The Internet and Higher Education,49*, 100791. https://doi.org/10.1016/j.iheduc.2020.100791

Schultz, M., Young, K., K. Gunning, T., & Harvey, M. L. (2022). Defining and measuring authentic assessment: A case study in the context of tertiary science. *Assessment and Evaluation in Higher Education,47*(1), 77–94. https://doi.org/10.1080/02602938.2021.1887811

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning,2*, 3–10. http://www.itdl.org/Journal/Jan_05/article01.htm.

Siemens, G. (2008). *What is the unique idea in Connectivism?* Retrieved May 21, 2014, from http://www.connectivism.ca/?p=116

Tatiana Dina, A., & Ciornei, S. (2013). The advantages and disadvantages of computer assisted language learning and teaching for foreign languages. *Procedia - Social and Behavioral Sciences,76*, 248–252. https://doi.org/10.1016/j.sbspro.2013.04.107

Tempelaar, D. (2020). Supporting the less-adaptive student: The role of learning analytics, formative assessment and blended learning. *Assessment and Evaluation in Higher Education,45*(4), 579–593. https://doi.org/10.1080/02602938.2019.1677855

Teng, C., Heydarnejad, T., Hasan, M. K., Omar, A., & Sarabani, L. (2022). Mobile assisted language learning in learning English through social networking tools: An account of Instagram feed-based tasks on learning grammar and attitude among English as a foreign language learners. *Frontiers in Psychology,13*, 1012004. https://doi.org/10.3389/fpsyg.2022.1012004

Thornton, P., & Houser, C. (2003). Using mobile web and videophones in English language teaching: Projects with Japanese college students. In B. Morrison, C. Green, & G. Motteram (Eds.), *Directions in CALL: Experience, experiments and evaluation.* English Language Centre, Hong Kong Polytechnic University. Retrieved from https://www.researchgate.net/publication/259962001

Thornton, P., & Houser, C. (2005). Using mobile phones in English education in Japan. *Journal of Computer Assisted Learning.,21*(3), 217–228. Retrieved from https://www.researchgate.net/publication/2599620

Vahdat, S., & Eidipour, M. (2016). Adopting CALL to improve listening comprehension of Iranian junior high school students. *Theory and Practice in Language Studies,6*(8), 1609–1617. https://doi.org/10.17507/tpls.0608.13

Van Lier, L. (2002). An ecological-semiotic perspective on language and linguistics. In C. Kransch (Ed.),*Language acquisition and language socialization: Ecological perspectives*. Continuum.

Virdaus, V. V. (2018). The strength of socio-affective strategy with Skype video call in the teaching speaking. *Media of Teaching Oriented and Children,2*(1), 10–24. https://doi.org/10.31090/paudmotoric.v2i1.687

Waks, L. J. (2016). *The evolution and evaluation of massive open online courses: MOOCs in motion*. Palgrave Macmillan.

Wood, J. (2001). Can software support children's vocabulary development? *Language Learning and Technology,5*(1), 166–201. Retrieved September 10, 2023 from https://www.learntechlib.org/p/90930/

Wu, W. V., Yen, L. L., & Marek, M. (2011). Using online EFL interaction to increase confidence, motivation, and ability. *Educational Technology & Society,14*(3), 118–129. https://doi.v14n3p118-1292011.

Yaghoubi, J., Mohammadi, I. M., Iravani, H., Attaran, M., & Gheidi, A. (2008). Virtual students' perceptions of e-learning in Iran. *The Turkish Online Journal of Educational Technology,7*(3), 89–95. https://doi.org/10.52223/jess.20223105

Yilmaz, F. G. K., Ustun, A. B., & Yilmaz, R. (2020). Investigation of pre-service teachers' opinions on advantages and disadvantages of online formative assessment: An example of online multiple-choice exam. *Journal of Teacher Education and Lifelong Learning,2*(1), 10–19. https://dergipark.org.tr/en/pub/tell/issue/52517/718396.

Zarei, A., & Mahmoodzadeh, P. (2014). The effect of multimedia glosses on L2 reading comprehension and vocabulary production. *Journal of English Language and Literature,1*(1), 1–7. https://doi.org/10.17722/JELL.V1I1.6

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