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The Role of Digital Testing on EFL Learners' Vocabulary Learning and Retention

Ghassab Sedehi, Maryam

Department of ELT, Islamic Azad University, Karaj Branch, Iran

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Abstract

The present study attempted to investigate the role of digital testing on EFL learners' vocabulary learning and retention. Sixty EFL students were divided into two groups: control (n=30) and experimental (n=30). A vocabulary test was administered to both groups in order to ensure that they were equivalent. Then, all participants attended 18 sessions where participants of the experimental group used an English vocabulary that included unknown vocabulary and different online tests while participants of the control group practiced vocabulary in the class but without any application. Immediately after the treatment was over, the vocabulary test was administered to both groups in order to evaluate the differences between the two groups in vocabulary acquisition. Moreover, the same test was administered to both groups two weeks after the administration of the post-test with the purpose of evaluating the differences between the two groups in vocabulary retention. The statistical analysis revealed a significant difference between the two groups in both the immediate and the delayed administrations of the vocabulary test. Therefore, it was concluded that digital testing enhanced both vocabulary acquisition and retention among EFL students. The findings of this study have implications for teachers, other researchers and EFL students.

Keywords: digital testing, EFL students, vocabulary learning, vocabulary retention

Introduction

While technology is rapidly advancing, assessment in education is still paper-based. This development of technology subconsciously affects education. Today, standard teaching and learning have been upgraded from paper to computer-based assessment systems and can also be a mediator in the teaching and learning process. Griffin (2003) notes that technological and educational advances are expected to change the appearance and function of many schools. Students are expected to be technologically literate to excel in future jobs and be creative citizens. According to Summak (2010), technology is a tool teacher can use to deliver content and implement practices in better ways. There is a greater motivation to learn through it among students. Idio (2000) reported that technology, such as a computer, increases the students' motivation to learn and is especially necessary for teachers as a teaching tool in the classroom.

Meanwhile, blended learning is an approach that combines conventional and communication technology-based methods. In blended learning, students enhance their learning experience online and face-to-face, where a hybrid environment is created. Blended environments provide choices for learning experiences not found in traditional or online methods, which ultimately increase learning motivation and achievement (Haroon et al., 2020). Teachers and students have the freedom to innovate and the freedom to learn independently and creatively. Some studies have reported encouraging language learning through online applications. Highlights include mobility, flexibility, practicality, originality of the learning context, and rich resources (AlJohali, 2019). As a result of policy, flexibility, and utility reasons, as well as pandemic conditions that have forced professors to undertake these efforts, the interest in combining face-to-face with online learning has grown rapidly in English courses. The main point of the increasing efforts of different parties related to policies, curriculum, learning media, plans and learning processes in English courses is whether the methods or tools used to influence the students' learning motivation. There should be a concern about whether the learning process is carried out using different learning resources, which augment the increasing trend of students' English vocabulary nowadays. The use of mobile applications in vocabulary learning results in a significant difference in student attention and satisfaction (Huang & Huang, 2015). Because vocabulary is an essential component of language learning, especially in the construction of reading, writing, speaking, and listening (Nation & Hunston, 2013), vocabulary mastery plays a key role in assessing language proficiency. There is much educational software for teaching vocabulary. One of this software is called English Vocabulary. This software includes teaching words, then it has various tests to learn and remember words. including writing, speaking, listening, and two separate word tests.

Vocabulary is a part of language learning, but it is the main foundation for the student to progress through each process and stage of language learning. Therefore, it is a communication tool in the form of learning that relies on the instructor as a provider of educational content independent of students through interesting and independent learning media or a combination of the two (Álvarez Valencia, 2016). The use of computer technology tools that are integrated into language learning cannot be ignored. If one wants to learn a language in maximum steps, vocabulary is the first step to go through, and combining learning media with the promotion of computer-based technology is a definite choice for language learners in the age of technology.

According to the experiences of the authors and different available literature, vocabulary is not a reference to be considered in the evaluation of language skills. Many researchers have found that vocabulary learning is an important component of a foreign language (Nation & Hunston, 2013). Most of the meaning in a language is revealed from words, so limited vocabulary is the biggest obstacle to the effective acquisition of the target language (Krashen, 1989). Due to the importance of vocabulary, vocabulary learning is currently receiving a lot of attention in foreign language research and teaching. How learners learn vocabulary effectively and efficiently or properly taught is controversial (Susanto et al., 2020).

The purpose of this research is to answer three research questions:

RQ1: Does digital testing enhance EFL learners' vocabulary learning and retention?

RQ2: Is there any significant difference in EFL learners' vocabulary learning and retention using digital testing?

Therefore, the hypotheses of this research are as follows:

RH1: Digital testing does not enhance EFL learners' vocabulary learning and retention.

RH2: There is not any significant difference in EFL learners' vocabulary learning and retention using digital testing.

Review of Related Literature

Digital Assessment

The emergence and growth of Web 2.0, Web 2.0 describes the current state of the internet, which has more user-generated content and usability for end-users compared to its earlier incarnation, Web 1.0., technologies have led to an accumulation of learning paths and platforms that encourage the emergence of a virtual community. Numerous studies have shown that using Web 2.0 developments in the classroom context can lead to positive outcomes for student learning (Kennedy et al., 2007). With recent research findings from numerous studies, online learning and teaching has been proven to enhance language learning. According to Conroy (2010), Internet-based language learning promotes independent academic writing among students.

Evaluation is at the center of the teaching process. It shapes learners' understanding of the curriculum and determines their ability to progress. Also, teachers' beliefs greatly influence the teaching process, especially in EFL contexts. With technology, the approaches used in classrooms can be diversified, thus providing a unique platform for students collaboration, which in turn provides learning opportunities for learning and interaction with each of them.

Online course assessment and evaluation serve multiple purposes for students, teachers, and administrators of educational systems and programs. Assessment is an integral part of any form of teaching and learning and it can be found in most educational design models as a prominent feature related to assessment (Branch, 2009). Students' achievement of learning outcomes can be assessed using online course assessment information, which can be used to diagnose learning problems, provide targeted feedback, scaffold students, and determine summative judgments (Peterson, 2016). In online courses, assessment approaches may include a variety of techniques all integrated into one online experience, including traditional assessment methods, such as quizzes and exams (multiple-choice questions), as well as authentic assessment methods, including e-papers, online journals, etc. or group discussions in online courses, a variety of assessment methods contribute to overall learner satisfaction (Sun et al., 2008). Much of the contemporary discussion of online assessment methods emphasize the authenticity and engagement of the learning task and the assessment method by creating "real-world" problems with unspecified tasks, and this requires integration and collaboration among learners (Conrad & Openo, 2018). As online learning technologies continue to evolve, new approaches to assessment, such as the growing popularity of learning analytics or hidden assessment (Bhagat & Spector, 2017) are being tested.

Vocabulary Learning and Retention

Many approaches have been taken to vocabulary, including grammatical translation, which maintains a long list of terms, and more modern methods that emphasize words explicitly. The strength of a building is built from the bricks that make up words, as Zhan-Xiang (2004) points out. Effective communication depends on vocabulary, one of the most important aspects of language, despite their small size.

Vocabulary is needed to improve proficiency in the target language (Boers & Lindstromberg, 2008). L2 students can develop their lexical skills formally and informally in the classroom as well as in everyday communication with others and experiences outside the

classroom (Ghezelseflou & Seyedrezaei, 2015). Scholars have different opinions about the value of vocabulary. According to Rivers (1981), teaching vocabulary is impossible. It can be introduced, illustrated and included in various events, but people have to learn it. In the past, vocabulary was undervalued and often misused in the literature (Judd, 1978; Nunan, 1991; Richards, 1976; Zimmerman, 1997). Most schools focus on grammar and spelling rather than vocabulary (Fernandez et al., 2009). According to Schmidt (2000), the emphasis on vocabulary began in the late 20th century. In other words, vocabulary teaching has played a central role in English language teaching in the last two decades (Ozgul & Abdulkadir, 2012; Morra & Camba, 2009).

According to McCarthy (1984) there is a distinction between understanding a word and using it, and knowing a word does not mean that it can be used in different ways. According to Ellis (1994), language use requires cognitive learning. Consequently, understanding the meaning of words does not happen in isolation, as it requires a socio-cultural environment such as school, group or home. According to Scott et al. (2008), "literacy is a social activity," so students learn scientific language through social experiences as part of a learning community (p. 197).

Therefore, a successful teacher should provide students with various opportunities to practice and use the language by designing appropriate educational programs. According to Ellis (1998), the teacher creates a space in which students can construct knowledge and reflect on what they learn.

Vocabulary is key in second language learning because it mediates language comprehension and production. In addition, vocabulary knowledge is essential for reading comprehension, especially for oral comprehension (Tyler, 1990). Despite its great importance, for years there was little emphasis on vocabulary Oxford (1990). However, researchers focus more on vocabulary teaching strategies and techniques (Abdolmanafirokni & Karimi, 2013; Barzegar & Rahimi, 2012; Sadeghi & Farzizadeh, 2013).

Sadeghi and Nobakht (2014) investigated the effect of meaning on students' vocabulary acquisition and retention. One familiar word, one unfamiliar/new word, two familiar words, one unfamiliar/new word and three familiar words, one unfamiliar/new word were used in this research by 47 experienced learners of English in three separate contexts. The findings of one-way analysis

showed that the context of two or three known words is too limited to have distinct semantic functions.

In addition, Ahour and Abbasi Dogolsara (2015) wanted to see how teaching multiple-choice items and sentence writing exercises affects English language students' vocabulary learning. For this reason, sixty students were selected and divided into two classes. After the treatment, the same version of the vocabulary test used in the pre-test was given to both groups as a post-test to ensure that the treatment was successful. The sentence writing task was more successful than the multiple-choice task.

Ebrahimian and Nabifar (2015) tried to compare the effects of three vocabulary learning techniques on the immediate and delayed vocabulary memory of English language learners, i.e. word segment strategy, word card strategy and text-clue strategy. PET was used to select 30 students from each class to participate in the study. Then three healthy classes were randomly divided into one of three experimental groups. When the findings were analyzed, it was found that the context-clue approach performed significantly better than the other strategies.

Valizadeh and Ahangari (2016) similarly discussed the effect of meaning on the learning of terms. To do this, participants were divided into two study groups: broad-context and narrow-context groups, as well as a control or decontextualization group. Group 1 learned idioms by listening to short stories that included the target terms, Group 2 learned idioms by listening to single sentences that included the target terms. The test group learned the terms by deconceptualizing the target terms. The findings of the immediate and delayed post-tests showed that extended contexts significantly influenced participants' vocabulary learning and retention.

In addition, Ciftci and Uster (2009) looked at two methods of teaching vocabulary: teaching vocabulary with details and teaching vocabulary by including word meanings. Subjects were given a pre-test to ensure familiarity with all terms and a post-test to assess the effectiveness of the procedures. Data analysis showed that the two groups performed similarly, indicating that both strategies should teach vocabulary fragments.

Even though both teachers and students understand the role of vocabulary in learning English, most students remain passive in their vocabulary acquisition. This is attributed to students' efforts to acquire the native language equivalents of the words rather than their meaning. Most of

them are familiar with them, but they don't want to use them in real situations (Baleghizadeh & Ashoori, 2010).

Methodology

Participants

The participants in this study were 60 Iranian pre-intermediate EFL students at a language institute in Qazvin, Iran. Nearly 60 students, aged 14 to 18, participated in this study. Nelson proficiency test was used for the homogeneity of language learners. All participants were given a questionnaire (Flower & Coe, 1976) to ensure that they were homogeneous, and 60 female learners were chosen. This test consists of 50 multiple-choice items organized in four parts: grammar (two sections), vocabulary, and reading comprehension. The time allotted was 40 minutes. The reliability of Nelson proficiency test (1976) was reported to be 0.87. The researcher divided the participants into two groups based on their age and lexical proficiency level: the experimental group (N=30) and the control group (N=30). The experimental group used English vocabulary application to improve their vocabulary knowledge. All tests were conducted online. Groups were created and controlled on WhatsApp. All the steps were online and virtual.

Instruments

Several data collection instruments were used during the process, including proficiency tests, pre-tests, post-tests, and delayed post-tests. Learners downloaded an English vocabulary application to their cellphones for treatment. In this application, new vocabulary is introduced with different kinds of tests. It was used by the experimental group.

Nelson Proficiency Test

As a measure of homogeneity in terms of proficiency, the Nelson English language proficiency test (Fowler & Coe, 1976) was administered to the participants prior to treatment to compare means. There are 50 multiple-choice items in the Nelson proficiency test, divided into four sections: grammar (two sections), vocabulary, and reading comprehension. The time allotted was 40 minutes. There was a 0.87 reliability rating for the Nelson proficiency test.

Pre-test, Post-test, Delayed Post-test

As a pre-test, post-test, and delayed post-test, the researcher developed vocabulary tests based on the treatment's vocabulary list. To check the pre-and post-test reliability, they were pilot studied on 15 EFL students. Cronbach's alpha analysis ran the reliability of the tests, and the results (r = 0.83) showed that the tests were reliable. Regarding the content validity of the test, the tests were confirmed by two English language teachers. A pre-test consisted of 40 elements, a post-test, and a delay post-test each had 50 elements. Test-takers had 40 minutes to complete each.

Data Collection Procedures

During the study, 60 students ranging in age from fourteen to eighteen were selected from two pre-intermediate intact classes at the Iranian language institute. First, all participants were homogenized and outliers were excluded using the Nelson online proficiency test. The experimental group (N=30) or the control group (N=30). Two groups were formed on WhatsApp. All research stages were controlled and followed up online. At first, an online pre-test was taken from both groups. Then, it was introduced to the experimental group by the English Vocabulary software as a treatment and it was used during 18 sessions. After 18 sessions, an online post-test was held for both groups. After a week, as the delay test, the online post-test was held again to check the retention of the learned vocabulary.

Design

The analysis included a pre-test, an immediate post-test, and a delayed post-test. Since this research studied the role of digital testing on EFL learners' vocabulary learning and retention, the role of digital assessment was viewed as the independent and learners' vocabulary learning and retention as the dependent variable. All subjects were at a pre-intermediate level at the time of the study, so proficiency level was used as a control variable**.**

Data Analysis

The main purpose of this research was to focus on the role of digital testing on EFL learners' vocabulary learning and retention. In order to answer the research questions of the study, data were analyzed using SPSS. The researcher used a non-parametric analysis because the data were not parametric. therefore, significant differences between experimental and control groups were examined using Wilcoxon and Mann-Whitney tests.

Results

The following section summarizes and elaborates on the findings of the investigation relevant to the research questions.

As was mentioned before, the study was done at the institute. Out of 70 EFL learners, 60 were selected based on their performance as a measure of homogeneity in terms of proficiency, the Nelson English language proficiency test. Then, they were divided into an experimental and a control group, 30 each.

Table1

Descriptive Statistic of Pre-test and Post-test of the Experimental Group

	N	Minimum	Maximum	Mean	Median	Std. Deviation
Pre-test experimental group	30	7.00	16.00	9.7667	9.0000	2.56882
Post-test experimental group	30	13.00	20.00	15.9500	15.5000	2.14697

Table 1 which reports descriptive statistic of pre-test and post-test scores obtained from the first experimental group, points at difference between analyzed sets of scores. In fact, the mean, median, and standard deviation are all smaller than post-test ($\bar{X}_{\text{pre-test}}$= 9.7667, $\bar{X}_{\text{post-test}}$=15.9500; Median $_{\text{pre-test}}$= 9.0000, Median $_{\text{post-test}}$= 15.0000; $S_{\text{pre-test}}$= 2.56882, $S_{\text{post-test}}$= 2.14697).

Table 2

Wilcoxon Signed-Rank Test of Pre-test and Post-test of Experimental Group

Total N	30
Test Statistic	465.000
Standard Error	48.595
Standardized Test Statistic	4.784
Asymptotic Sig. (2-sided test)	.000

Table 2 which is dedicated to the result of the non-parametric test of significance of the observed difference, statistically proves that the improvement caused by treatment to which the members of experimental group have been exposed is statistically considerable W=465.000.

Table 3

Wilcoxon Signed-Rank Hypothesis Test of Pre-test and Post-test of the Experimental Group

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between Pre-test experimental group and Post-test experimental group equals 0.	Related-Samples Wilcoxon Signed Rank Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

Table 4

Independent-Samples Mann-Whitney U-Test Summary of a Scores of the Two Groups on the Post-test of Vocabulary Learning

Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Sig. (2-tailed)
experimental group	30	22.45	673.50	208.5000	.000
control group	30	38.55	1156.50		

The difference between the mean scores of the two groups on the vocabulary pre-test was analyzed using Mann-Whitney U-test which showed that this difference was statistically significant in favor of the experimental group (U=208.50; $p< 0.05$). See Table 4.

Table 5

Independent-Samples Mann-Whitney U-Test Summary of a Scores of the Two Groups on the Delayed-test of Vocabulary Learning

Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Sig. (2-tailed)
experimental group	30	24.76	743.00	278.0000	.009
control group	30	36.23	1087.00		

Moreover, the difference between the mean scores of the two groups on the vocabulary delayed measurement was analyzed using Mann-Whitney U-test which showed that this difference was statistically significant in favor of the experimental group ($U=278$; $p< 0.05$) See Table 5.

Discussion and Conclusion

The present study attempted to investigate the role of digital tests on the learning and retention of English language learners' vocabulary. After analyzing the data which were obtained from experimental and control groups the following results were revealed. The study included three hypotheses. As a first step, a pretest consisting of forty multiple-choice items was administered to both experimental and control groups to determine if there was any significant difference in vocabulary knowledge at the beginning of the study. The results of the posttests were then compared. As a result of using an English vocabulary application that includes many new vocabulary words and various tests, students could learn and retain different vocabulary. Therefore, the first hypothesis stated that digital testing does not enhance EFL learners' vocabulary learning. Statistical analysis rejected the first hypothesis. The researcher analyzed the scores of the posttest2 (administered one week after the posttest1) to determine whether the digital test affected vocabulary retention. As a result of using an English vocabulary application in the experimental group, a significant difference was observed in the mean scores after analyzing the data. Therefore, the second hypothesis of the study stated that digital testing does not enhance EFL learners' vocabulary retention and could be rejected as well. And finally, according to the data obtained and the analyzes performed, the third hypothesis, there is not any significant difference in EFL learners' vocabulary learning and retention using digital testing is also rejected.

A number of studies have demonstrated that online games and applications are effective for improving vocabulary learning, e.g. (Gozcu & Caganaga, 2016; Horst, Cobb, & Nicolae, 2005; Hassan, 2010). In addition, with the current situation where most of the classes are held online, not much research related to online tests has been done. It was decided that choose this topic to research and investigated to find the role of digital tests on the learning and retention of English language learners' vocabulary.

This study investigated the role of digital testing on EFL learners’ vocabulary learning and retention. According to the results, digital testing can improve vocabulary learning and retention. The importance of technology in education and the positive effect of technology use on L2 learners'

achievement has been confirmed (Khodabndeh, 2020), therefore, the integration of learners' interaction as well as their use of technology contributed to improving vocabulary learning (Asadi et al., 2019).

Finally, the aforementioned data analysis demonstrated that digital testing applications are not instrumenting of power, but democratic methods of learning that prepare learners for real-world communication. There can be other studies working on other skills and sub-skills. Digital testing needs a lot more research in the field of language learning, especially in Iran. There are many variables that need to be taken into consideration in choosing the digital testing like gender and personality.

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