

## The Effects of Digital Formative Assessment on Iranian Pre-intermediate Learners' Spelling Achievement and Vocabulary Retention in Mashhad

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### Abstract

Digital formative assessment was considered as using digital tools and technology to apply formative assessment in the EFL classrooms. Moreover, language learners' vocabulary retention and spelling abilities are at the heart of language learning. Therefore, the present study examined the effects of digital formative assessment in improving Iranian pre-intermediate EFL learners' spelling achievement and vocabulary retention in Mashhad. Fifty (N=25 male & N=25 female) pre-intermediate EFL learners into two groups took part in the study. The study was an experimental study with pre-test and post-test designs. The experimental group used the *Spelling Bee* application in contrast to the control group. This application could present corrected words to students when they did something wrong. Moreover, the teacher gave feedback to students during tasks. The control group did their tasks on the sheet and got feedback from the teacher. KET (Key English Test) test, vocabulary, and spelling test were used as the instruments of the study. At the beginning of the study vocabulary and spelling tests were presented as a pretest to participants in both groups. The participants answered the spelling and vocabulary tests as the post-tests. After the posttest, a delayed posttest was presented to assess vocabulary retention. The obtained results revealed that the use of the digital formative assessment had no significant effect on pre-intermediate Iranian EFL learners' spelling achievement and vocabulary retention. Administrators, EFL teachers, and EFL language learners, can take advantage of the result of the present study.

**Keywords:** Digital Formative Assessment; Formative Assessment based on Mobile Learning (FAML); Spelling Achievement; Technology; Vocabulary Retention.

### 1. Introduction

Digital tools create opportunities for language learners to learn English as a foreign language. Moreover, it is believed that using digital tools enables language learners to direct their learning (Looney, 2019). Bhaghad and Spector (2017) believed that using digital tools can be useful in applying formative assessment in EFL classrooms. Nicol and Macfarlane-Dick (2006) referred to formative assessment as a kind of assessment that is specific to provide feedback on language learners' performance. Morreim (2016) believed that technology and

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formative assessment could be beneficial, but when used together. In addition, some researchers (e.g., Shabaneh & Farah, 2019) considered vocabulary to be the heart of the language and some researchers (e.g., Al-Busaidi & Al-Saqqa, 2015; Reed, 2012) considered spelling, a central aspect of literacy in any language as it is crucial in written communication. To the best of the researchers' knowledge, almost no prior studies have examined the effect of digital formative assessment on spelling achievement and vocabulary retention. It seems that the findings of this study are highly valuable for teachers and instructors to consider the use of digital tools and invest more in designing and applying them for applying formative assessment. The findings may also help materials developers and syllabus designers to consider the importance of digital tools in classroom activities while planning textbooks and materials.

Therefore, it was interesting to investigate the effects of digital formative assessment in improving Iranian pre-intermediate EFL learners' spelling achievement and vocabulary retention in Mashhad. To achieve this goal, the mobile application Spelling Bee was used to support digital formative assessment. The following research questions were presented:

- Q1. Does the digital formative assessment have any statistically significant effects on pre-intermediate Iranian EFL learners' spelling achievement?
- Q2. Does the digital formative assessment have any statistically significant effect on pre-intermediate Iranian EFL learners' vocabulary retention?
- Q3. Does gender have any significant effect on language learners' spelling ability?
- Q4. Does gender have any significant effect on language learners' vocabulary retention?

## 2. Review of Literature

According to Ainsworth (2006), formative assessment is used to control the learning process and provide feedback to educators to adjust instruction. Oldfield et al. (2012), explained procedures that demonstrate support for formative assessment. Among these procedures, technology can help with assessment, especially formative assessment. Elmahdi, et al. (2018) believed that formative assessment yielded substantial learning gains with the affordable wireless 21st-century technology that is designed to enhance learners' learning. It is important to mention that there has been little progress in the area of digital formative assessment that is appropriate for reinforcing learners' learning. Reynolds et al. (2020), presented a report on underlying principles and best practices for formative assessment. Looney (2019) reviewed international studies on digital formative assessment (DFA). Golabi (2022) mentioned that using technology in EFL classrooms can improve language learners' achievements. As Ghahreman et al., (2021) believed that using technological devices and digital tools can affect language learners' vocabulary knowledge. As Hadimahmoodi and Talang (2013) emphasized language learners' vocabulary learning and vocabulary retention in EFL learning. It is mentioned that the term vocabulary retention refers to remembering the words after a short time, vocabulary retention is of crucial importance to EFL teachers.

Some researchers (e.g., Ghahreman, et al., 2021; Golabi, 2022; Kaviani, 2022) believed that using technology and computer-assisted learning devices can provide opportunities for learners to enhance their vocabulary knowledge. It was mentioned that some resources, such as video games may also foster language learning, and learners can adjust the pace and time of their learning. Whenever, Al-Awadhi (2018) argued that using mobile-assisted devices and mobile applications did not necessarily improve learners' vocabulary retention as several factors may

lead to retention improvements such as learners' intrinsic motivation, hard work, and working memory.

The spelling of English words is particularly difficult due to the complexity of the English writing system and the processes involved (Derakhshan & Shirejini, 2020). Therefore, it is challenging to learn the letters of the alphabet that are represented in different spellings (Reeds, 2012). Al-Busaidi and Al-Saqqa (2015) stated that "In our careers as EFL teachers, we have constantly noticed that learners are often unable to spell monosyllabic words which are so simple. The learners' errors are noticeable and persistent, so these errors often affect their speaking and writing skills" (p.181). In addition, teaching spelling is taught in isolation from reading and writing (Reeds, 2012), because teachers sometimes pay attention to these skills more than spelling, and they believe that the English language spelling system is too irregular and unpredictable to make a useful instruction. Reed's (2012) direct observation of teachers showed that less than four percent of the class activity is devoted to the spelling of the words. Moreover, Mehrpoor and Ghayour (2017) concluded that educational computerized games affected language learners' spelling ability significantly. Akbari (2016) conducted a qualitative study and used semi-structured interviews to understand language learners' difficulties and their spelling strategies. It was concluded that basic language skills such as writing, reading, listening, and speaking skills affected language learners' spelling ability. In addition, there is a need to revise English instruction to study spelling in the Iranian educational system.

### **3. Method**

To answer the quantitative research questions KET (Key English Test) placement test, pretest and posttest vocabulary test, and spelling test were used.

#### *3.1. Participants and Setting*

Fifty Iranian (N=25 male & N=25 female) pre-intermediate EFL learners participated in this study. To ensure the participants' homogeneity KET placement test was administrated to participants. The participants' age ranged from 11 to 14 years. Fifty Iranian EFL learners as participants of the study were randomly divided into the control group (N=12 male & 13 female) and experimental group (N=12 male & N=13 female). The setting was private English language institutes in Mashhad. This study ran in 2021.

#### *3.2. Instrumentation*

KET placement test was administrated to learners as a means of checking participants' homogeneity. The Key English Test is a pre-intermediate level examination provided by the Cambridge English assessment department. This test contains 32 multiple-choice items. Typically, this test is taken by learners aged between 11 and 14. The reliability of the test was reported between .07 and 0.9. The validity of the KET placement test was proved by Harwood (2007).

*3.2.1. Researcher-Made Spelling Test as Pretest and Posttest.* According to personal communication, dictation is not reliable for testing spelling, so the researcher designed a multiple-choice spelling test. This test was used as a pretest and posttest. The post-test was also presented at the end of the study. It is to be mentioned that the post-test was designed in the same form as the pretest. The reliability of the spelling test was 0.95 and estimated through

Cronbach Alpha. The Cronbach's alpha reliability of the vocabulary test was 0.77. The Rasch analysis was also used to validate the tests. Validity evidence for the spelling test and the vocabulary test was provided using the Rasch model (Rasch, 1980). Rasch model was fitted to the spelling and vocabulary tests using the Win-Rasch measurement program (Linacre, 2017). The fit of data to the Rasch model was evidence that the items work together to define a variable and persons can be located on the variable line (Wright & Masters, 1982). Findings showed that all the spelling items fit the Rasch model while two items misfit the vocabulary test. In other words, the spelling test was valid and the vocabulary test was valid if items 25 and 33 were deleted.

### 3.2.2. *Researcher Made Vocabulary Tests as Pretest, Posttest, and Delayed Posttest.*

Farhadi et al. (2019) stated "a test type that is generally popular in vocabulary tests, but because of its backwash effects is not recommended, is the so-called standard vocabulary type. A short conversation-like context would make a better item than a brief statement, especially for less proficient subjects" (p.167). Therefore, based on their guidelines a test was designed for vocabulary pretest, posttest, and delayed posttest. The test was presented to participants as a pretest. After an interval, the test was administrated to participants to measure the range of learners' vocabulary knowledge. After the post-test, the delayed post-test was presented to learners to measure their vocabulary retention as a posttest. The delayed post-test was designed in the same form as the post-test.

### 3.3 *Procedure*

The first step of this study was selecting the participants. To achieve this end, 50 Iranian pre-intermediate EFL learners, were selected based on their scores on the Key English Test (KET). Based on the Cambridge English scale score, students who received scores between 100 to 119 were randomly divided into control (N=25) and experimental (N=25) groups. At the beginning of the study, both groups received two pre-tests to measure learners' spelling ability and vocabulary knowledge. These tests included 40 multiple-choice items which were selected from chapter one in the *Spelling Bee* application. *Spelling Bee* is an English word application. The most important feature of this application is showing the picture of words that learners want to spell. It contained 20 chapters including more than 5000 words which were divided into specific topics such as music, beauty, colors, sport, and nature. The experimental group had English classes through WhatsApp and the control group had English classes at the institute. During the class, the experimental group use the *Spelling Bee* as a treatment. In the experimental group, the teacher applied formative assessment through the digital tool in contrast to the control group. The teacher applied formative assessment by providing feedback to students on their performances and included comments on both positive and weak aspects of the learner's performance on the sheet in the control group. In both groups, the feedback was provided in a useful time or timely manner by the teacher when the learners were engaged in doing tasks, so, if necessary, they should do tasks again. The experimental group did the tasks again by *Spelling Bee*, but the control group did them on the sheet. Moreover, the researchers gave a multiple-choice spelling test and multiple-choice vocabulary test as the posttests. After the posttests, a delayed posttest was conducted to assess vocabulary retention. The delayed

posttest was in the same form as the posttest. The experiment carried out 16 sessions (i.e., eight weeks); with 13 sessions for applying the experiment and three sessions devoted to the pretest and posttest, and a delayed posttest.

#### 4. Results and Discussion

An independent samples t-test was applied to compare the results of language learners in the experimental group and control group on the spelling pretest. Results showed that the experimental group did not perform better than the control group.

Table 1  
*Independent Samples Test for Spelling 1*

	F	Sig.	Sig. (2-tailed)	Mean Difference
Spelling	.003	.955	.624	.64
Equal variances not assumed			.626	.62

As Table 1 shows, the results of the experimental group were not significantly better than the control group. This indicated that the two groups were the same on the spelling pretest.

An independent sample t-test was run on the vocabulary pretest (Vocabulary 1). Results showed that language learners' scores were the same in both groups.

Table 2  
*Independent Samples Test for Vocabulary 1*

	F	Sig.	Sig. (2-tailed)	Mean Difference
Vocabulary	.52	.47	.914	-.08
Equal variances not assumed			.916	-.08

As Table 2 shows, there was no difference between the two groups on the vocabulary pretest. In the next step, the spelling scores of the control group and experimental group were compared in the posttest (Spelling 2). Results showed that using digital formative assessment did not have significant effects on language learners' spelling ability in the experimental group.

Table 3  
*Independent Samples Test for Spelling 2*

	F	Sig.	Sig. (2-tailed)	Mean Difference
Spelling	.014	.907	.821	-.19
Equal variances not assumed			.821	-.19

As table 3 shows, the results of the experimental group were not significantly better than the control group. This finding revealed that the use of digital formative assessment had no significant effects on pre-intermediate Iranian EFL learners' spelling achievement.

An independent t-test was run on the vocabulary achievement test (i.e., Vocabulary 2 posttest). Results showed that digital formative assessment did not have significant effects on the language learners' achievement on the posttest.

Table 4

*Independent Samples Test for Vocabulary 2*

	F	Sig.	Sig. (2-tailed)	Mean Difference
Vocabulary	.3.48	.07	.34	-.53
Equal variances not assumed			.36	-.53

As table 4 shows, the experimental group did not perform better than the control group on the post-test. In other words, the use of a digital formative assessment had no significant effect on pre-intermediate Iranian EFL learners' vocabulary achievement. An independent samples t-test was run on the vocabulary retention test (i.e., delay post-test).

Table 5

*Independent Samples Test for Delay Vocabulary Retention Test Posttest*

	F	Sig.	Sig. (2-tailed)	Mean Difference
Delay Posttest	.52	.47	.58	-.30
Equal variances not assumed			.58	-.30

The results of male and female students were compared on the three posttests of the study, (Spelling 2, Vocabulary 2, and Vocabulary 3). Results showed that the results of male and female students on these three tests were not significantly different from each other (Table 6).

Table 6

*T-test for Comparing Males and Females on the Posttests*

	F	Sig.	Sig. (2-tailed)	Mean Difference
Spelling 2	.47	.49	.85	.16
Vocabulary 2	.05	.81	.35	.16
Vocabulary 3	.01	.90	.32	.57
			.34	.55
			.28	.55

The finding was in line with Faber and Visscher (2018). They examined the effect of the digital formative tool on learners' spelling achievement. In addition, the results showed that the use of a digital formative assessment had no significant effect on pre-intermediate Iranian EFL learners' vocabulary retention. The finding was in the line with Al-Awadhi's (2018) findings. It was reported that mobile-assisted devices and mobile applications did not improve students' vocabulary retention. Moreover, the results showed that gender did not have significant effects on language learners' vocabulary retention and their spelling ability. The results of the study were consistent with Grace's (2002) study. It was concluded that gender did not have any significant effects on language learners' vocabulary retention.

## 5. Conclusion

The results showed that digital formative assessment had no significant effects on pre-intermediate EFL learners' spelling achievement. Moreover, the digital formative assessment had no significant effects on pre-intermediate Iranian EFL learners' vocabulary retention. Besides, according to the statistical results, the researchers found out some learners could not communicate with digital formative assessment. After talking to them, they declared that using sheets and paper was easier and more convenient. It is concluded that digital formative assessment did not have any significant effect on pre-Intermediate Iranian EFL learners' spelling achievement and vocabulary retention in Mashhad. However, several barriers need to be addressed first. One of the overarching issues is the absence of effective digital tools training, even though informants stated that they had received some training. It would be interesting to replicate this research with more participants. Furthermore, it is needed to gather data about digital tools to support digital formative assessment. It is necessary to find out the problems with using current technologies to support digital formative assessment in EFL classrooms.

## Declaration of Conflicting Interests

The authors declare that they have no conflicts of interest.

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