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THE IMPACT OF DIGITAL GAMES ON IRANIAN PRE-INTERMEDIATE EFL LEARNERS' VOCABULARY LEARNING: WITH A FOCUS ON GENDER

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ABSTRACT

Vocabulary is an indispensable component of every language learning experience (Adolphs & Schmitt, 2003; Nation, 2001; Hulstijn & Laufer, 2001; Laufer & Goldstein, 2004; Laufer *et al*. 2004; Gu, 2003; Huang, 2007).Learning vocabulary is a mostly deemed as a cumbersome activity of EFL/ESL learners' interlanguage, especially in the EFL context. Bahns and Eldaw (1993) suggested that in producing correct English, knowledge of vocabulary turned out to be a main problem for students. This is probably because inadequate attention has been paid to the proper teaching of vocabulary in teaching practice. In this respect, many researches have been conducted to find new ways to propose new strategies and methods of learning a vocabulary learning.

Recently, more attention has been paid to the application of electronic programs into learning vocabulary learning. Electronic education is effective for it offers collaboration and interaction with experts and peers as well as a higher success rate than alternatives (Hambrecht and Company, 2000). Electronic learning provides faster and greater access to information for education (Hamilton et al., 2001, cited in Maynard & Cheyne, 2005). A number of previous researches have employed aspects of Electronic Learning (hereafter, e-learning) while attempting to suggest new vocabulary learning strategies. E-learning is defined as "the acquisition and use of knowledge distributed and facilitated primarily by electronic means. This form of learning currently depends on networks and computers but will likely evolve into systems consisting of a variety of channels (e.g., wireless, satellite), and technologies (e.g., cellular phones, PDA's) as they are developed and adopted." (Ginns & Ellis, 2009, p. 14).

With this in mind, it is worth mentioning that within the context of EFL learning in Iran, there are major problems or mistakes in vocabularylearning and teaching practices; which mightbe due to disregarding of creating connections between Iranian EFL teachers and English native speakers. So, in order to develop the quality of producing adequate English, English teachers must pay more and more attention to the experience of vocabulary teaching. This is exactly what has been often overlooked in many EFL classes in Iran. Moreover, teaching vocabulary via ordinary methods (e.g. employing written materials in the time of class) has not proved to be efficient. Therefore, seeking a new way to increase learners' exposure and decrease the limitation of being in contact to new words can serve a good solution to this problem. To help Iranian EFL learners with better vocabulary learning and to fill the existing gap in the field, the present study explores whether or not using digital games helpIranian pre-intermediate EFL learners' vocabulary learning.

Statement of the Problem

Learning vocabulary is a big problem in learners' interlanguage, especially in the EFL contexts. Bahns and Eldaw (1993) suggested that in producing correct English, knowledge of vocabulary turned out to be a main problem for students. This is probably because inadequate attention has been paid to the proper teaching of vocabulary in teaching practice. In the context of EFL learning in Iran, due to lack of connection with English native speakers, there are major problems in understanding and acquiring of vocabulary. In order to develop the quality of interlanguage and enable the students to produce adequate English, English teachers must pay enough attention to the teaching of vocabulary. This is exactly what is ignored in many EFL classes in Iran. Vocabulary learning has proved to be a great problem for many EFL students. Teaching vocabulary via ordinary methods by employing written materials in the time of class does not guarantee a fair acquisition of vocabulary. Therefore, seeking a new way to increase learners' interest can serve a good solution to this problem.

To this end, in order to help Iranian EFL learners with vocabulary learning and to fill the existing gap in this field, the present study explored if using computer digital games contribute to Iranian intermediate EFL learners' vocabulary learning.

Research Questions

In this sense, the following research questions were posed:

1. Do digital games have any effect on Iranian Pre-intermediate EFL learners' vocabulary learning?
2. In a case of any effect, which gender benefits more?

Research Hypotheses

Based on the above research questions, the following research hypotheses have been posed:

$H0_1$: A Digital game does not have any effect on Iranian Pre-intermediate EFL learners' vocabulary.

$H0_1$: Digital games have more effect on vocabulary learning of Iranian male pre-intermediate EFL learners than female ones.

Purpose of the Study

As Nesselhauf and Tschichold (2002) have pointed out, Computer-Assisted Language Learning (CALL) is specifically appropriate for learning vocabulary meanwhile vocabulary is one of the fields that can be easily practiced outside the classroom. Accordingly, it is quite clear that there is not enough research related to role of computer digital games in vocabulary learning. Therefore, this study contributes to the broad field of vocabulary acquisition by examining the role of digital games on retrieval of vocabulary. To be more specific, this study aims to find out if using computer digital games could be helpful to students' better acquisition and retrieval of English words or not.

So the present study aims to investigate the role of digital games on Iranian Pre-Intermediate EFL Learners' Vocabulary Learning. Moreover, this study endeavors to explore in case of any effect which gender benefits more.

Significance of the Study

Vocabulary lessons delivered via digital games are more appealing to students. Mixing the related vocabulary with games can be more helpful for teenagers than it is with paper-based learning material. Hence, CALL can be a more effective medium for learning English vocabulary than the paper material in that it arouses learners' motivation, which in turn increases their interest in the lessons and maximizes the exposure to the target language. On the other hand, many Iranian EFL learners cannot deal with the challenge of speaking English as a foreign language, due to the fact that they cannot manage their word repertoire. One reason may be their weak short term memory. The result of this study can be helpful to Iranian EFL teachers in handling vocabulary lessons more easily since it has been noticed that the paper material in a rather traditional manner fails to arouse Iranian EFL learners' interests.

Review of the Literature

Commonly, L2 learning takes place within a classroom, but when the L2 is a global language, such as English, it also occurs to a large extent outside of school, at least in Sweden (Olsson, 2011) and most likely also in countries with comparable educational systems and socio-economic prosperity, such as Finland, Belgium and the Netherland. In this sense, L2 learning gains more importance since it is deemed to have a crucial role which is indispensable to one's performance in the society. Moreover,

without vocabulary knowledge not even one message could be easily and correctly transmitted.

One new area within e-learning contexts is digital games. In this regard, it has been claimed that some digital games can have positive effects on learners' behaviors. Some of students are able to keep a wider range of vocabulary in their mind for communication whereas they do not know correct grammar. They have motivation for playing digital-games. And they try to use a wide range of vocabulary during playing games.

Assertions that digital game could become an integral part of language teaching have been made at varying points over the last two decades, but are clearly yet to be realized. Nevertheless, advances in network-based learning and the large, online communities, now using games have stimulated renewed interest in the field.

According to Patricia Deubli (2006), digital game-based learning has the ability to engage and motivate students and present learning experience while helping long-term memory and providing practical experience. According to Patricia Deubel (2006), digital game-based learning has the ability to engage and motivate students and present learning experiences while helping long-term memory and providing practical experience.

Furthermore, the use of multimedia in education has significantly made people's learning processes, producing a meaningful learning. Previous study show that computer-based video games learning has had an important role in increasing the level of learning and motivation, along with promoting imagination in learners. Results from a number of research studies show that suitably designed multimedia instruction increase, the power of students' learning performance in science, mathematics and literacy.

In this vein, as Nesselhauf and Tschichold (2002) have pointed out, Computer-Assisted Language Learning (CALL) is specifically appropriate for learning vocabulary meanwhile vocabulary is one of the fields that can be easily practiced outside the classroom. According, to the discussion presented above and based on the literature reviewed, it is quite clear that there is not enough research related to role of digital games. Therefore, thisstudy contributes to the broad field of vocabulary acquisition by examining the role of digital games in the acquisition of vocabulary. To be more specific, this study aims to find out if using digital games can be helpful for EFLstudents' acquisition of vocabulary. Moreover, the study aims to investigate whether gender has any significant effect on Iranian pre-intermediate EFL learners' vocabulary learning through digital games.

Moreover, the previous studies indicate that computer-game programs have important roles that can motivate, challenge, increase meaningful learning and promote fantasy in learners. So the present study aims to investigate the role of digital games (video games) on facilitating learner's cognitive learning. This study probed the effect of the different types of vocabulary learning with a focus on gender. The purpose of this study is to this study is to show the positive effect of digital-game on learners' vocabulary with a focus on gender. I want to study relationship between digital games and meaningful learning. This way is caused motivation on learners.

This study is significant in that it explores the impact of playing digital games on vocabulary learning. The expected effect of digital game and vocabulary learning in the pre-intermediate EFL learners would help improve learners' different needs of vocabulary learning. In this way, learners can interestingly face with vocabulary and this way has had important role in increasing the motivation on students for vocabulary learning with promoting imagination in learners.The application of this methodis expected to have many useful effects in producing a meaningful learning. Also, digital games are expected to embody many privileges in promoting deep and meaningful learning in autonomous contexts.

Methodology

Participants

Population of the study were 200 Iranian EFL pre-intermediate students learning English in Iranian high schools. One-hundred students were chosen from this population based on results obtained from Quick Oxford Placement Test (QOPT). They were both males and femaleswhose age ranged from 15-19 years old. They were EFL high

school students in Isfahan, Iran. The students were divided into experimental and control groups. The experimental groupwas comprised 50 EFL learners (25 males and 25 females) who learned vocabulary using computer tools and digital games. Prior to the application of games, the researcher helped them learn how to use these games.The other 50 (again 25 males and 25 females) students formed thecontrol group. They learned vocabulary through common techniques of teaching vocabulary.

Instruments

The main instruments employed in the present study for the aims of collecting data were QOPT test, Vocabulary Knowledge Scale (VKS)pre-test and VKS post-test. These instruments are elaborated more in the following.

Oxford Quick Placement Test (OQPT)

The Oxford Quick Placement Test (OQPT) will be used to measure the participants' language proficiency. This test consists of sixty items with different question formats comprising of two parts (Part one and Part two). There are multiple choice, item matching, and cloze test type items in the test. In each item there is a missing word for which there are four options. Students should find the correct item among these options. The 100 participants (50 males and 50 females) were able to pass the test with a score among 17-30. Based on the test scoring level chart, those whose scores in the test were between 30-46 were considered as the pre-intermediate level and categorized to be at the same level according to the OQPT results.

Vocabulary Knowledge Scale (VKS)

Besides measuring students' proficiency level, it seemed necessary to measure their vocabulary knowledge in order to make sure they were at the same level of vocabulary knowledge. So it seemed proper to use Paribakht and Wesche's Vocabulary Knowledge Scale for this purpose. This scale is designed to measure the different levels of lexical knowledge of target words that learners are learning.

Materials

In order to evaluate vocabulary learning performance on vocabulary learning through digital games, a digital game for the instruction of vocabulary were adopted from Exercise CD of Hey There series, book 1 and 2.

Data Collection Procedure

Firstly, the researchers administered OQPT to the students. The scores helped the researchers to choose 100 students at the pre-intermediate level. Then they were randomly assigned to one experimental and one control group. At this time, VKS pre-test was administered and scores were recorded. Then, members of both groups attended 10 sessions in 3 weeks about 15 minutes. In these sessions, members of the experimental groups played digital games incorporating the words while members of the control group received common vocabulary learning instructions. The researcher administered post-test based on vocabulary taught during the experiment to both groups after the end of this period.

Data Analysis

Descriptive statistics including frequencies, means, standard deviations, and percentages was employed. Use was made of independent sample T-test to evaluate the participants' homogeneity in VKS pre-test. Furthermore, independent samples t-test was run to figure out the difference between gender's performances.

Results

This study entitled "The Impact of Digital Games on Iranian Pre-Intermediate EFL Learners'

Vocabulary Learning: with a Focus on Gender" aims at investigating the following research questions;

Q_1: Do digital games have any effect on Iranian Pre-intermediate EFL learner's vocabulary learning?

Q_2: In a case of any effect, which gender benefits more?

Based on the above-mentioned questions the following hypotheses were proposed:

H_{O1}: A Digital game does not have any effect on Iranian Pre-intermediate EFL learners' vocabulary with a focus on gender.

H_{12}: Digital games have more effect on vocabulary learning of Iranian male pre-intermediate EFL learners than female.

The above mentioned hypotheses were analyzed using independent-samples t-test which has two main assumptions; normality of the data

and homogeneity of the variances of the groups. The latter will be discussed when reporting the main results. It should be noted that the present data enjoyed normal distribution. The ratios of skewness and kurtosis over their respective standard errors were lower than the absolute value of 1.96 (Table 1).

Table 1: Testing Normality Assumption

Group	Gender		N	Skewness			Kurtosis		
			Statistic	Statistic	Std. Error	Ratio	Statistic	Std. Error	Ratio
Experimental	male	OPT	25	.175	.464	0.38	-.625	.902	-0.69
		Pretest	25	-.559	.464	-1.20	.204	.902	0.23
		Posttest	25	-.253	.464	-0.55	-1.101	.902	-1.22
	female	OPT	25	-.199	.464	-0.43	.305	.902	0.34
		Pretest	25	-.002	.464	0.00	.311	.902	0.34
		Posttest	25	-.132	.464	-0.28	-1.200	.902	-1.33
Control	male	OPT	25	-.412	.464	-0.89	.074	.902	0.08
		Pretest	25	-.396	.464	-0.85	-.065	.902	-0.07
		Posttest	25	.440	.464	0.95	-.961	.902	-1.07
	female	OPT	25	-.317	.464	-0.68	-.473	.902	-0.52
		Pretest	25	-.368	.464	-0.79	-.214	.902	-0.24
		Posttest	25	-.462	.464	-1.00	-.632	.902	-0.70

Oxford Placement Test

An independent-samples t-test was run to compare the experimental and control groups' means on the Oxford Placement Test (OPT) in order to prove that they were at the same level of general language proficiency prior to the main study. Based on the results displayed in Table 2 it can be claimed that the experimental (M = 17.87, SD = 6.51) and the control (M = 17.06, SD = 7.65) groups had almost the same means on the OPT.

Table 2 : Descriptive Statistics; Oxford Placement Test by Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
OPT	Experimental	50	17.84	6.513	.921
	Control	50	17.06	7.652	1.082

The results of the independent-samples t-test (t (98) = .549, p= .584, r = .055 representing a weak effect size) (Table 3) indicated that there was not any significant difference between the two groups' mean scores on the OPT. Thus it can be claimed that they enjoyed the same level of general language proficiency prior to the main study.

Table 3: Independent Samples Test; Oxford Placement Test by Groups

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	1.340	.250	.549	98	.584	.780	1.421	-2.040	3.600
Equal variances not assumed			.549	95.563	.584	.780	1.421	-2.041	3.601

It should be noted that the negative 95 % lower bound confidence interval of -2.04 indicated that the difference between the two groups' means on the OPT could have been zero. Thus the above mentioned conclusion as no significant difference between the two groups' means was correctly made.

It should also be noted that the assumption of homogeneity of variances was met (Levene's F = 1.34, p = .250). That is why the first row of Table 3, i.e. "Equal variances assumed" was reported.

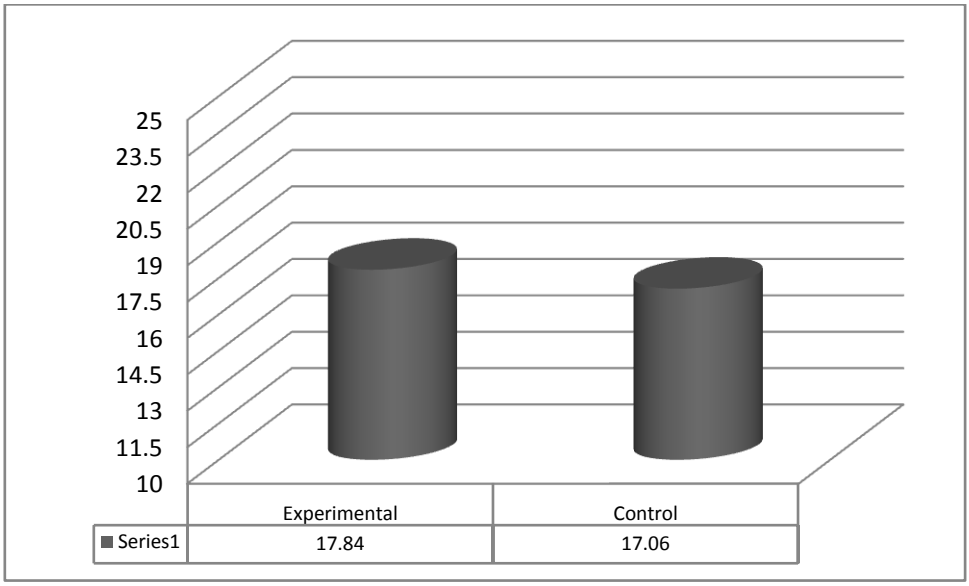

Figure 1.Oxford Placement Test by groups

Pretest of Vocabulary

An independent-samples t-test was run to compare the experimental and control groups' means on the pretest of vocabulary in order to prove that they were at the same level of vocabulary knowledge prior to the main study. Based on the results displayed in Table 4 it can be claimed that the experimental (M = 24.46, SD = 5.66) and the control (M = 25.56, SD = 6.43) groups had almost the same means on the pretest of vocabulary.

Table 4: Descriptive Statistics; Pretest of Vocabulary by Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest	Experimental	50	24.46	5.668	.802
	Control	50	25.56	6.431	.909

The results of the independent-samples t-test (t (98) = .907, p= .366, r = .091 representing a weak effect size) (Table 5) indicated that there was not any significant difference between the two groups' mean scores on the pretest of vocabulary. Thus it can be claimed that they enjoyed the same level of vocabulary knowledge prior to the main study.

Table 5: Independent Samples Test; Pretest of Vocabulary by Groups

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	1.371	.245	.907	98	.366	1.100	1.212	-1.306	3.506
Equal variances not assumed			.907	96.480	.366	1.100	1.212	-1.306	3.506

It should be noted that the negative 95 % lower bound confidence interval of -1.30 indicated that the difference between the two groups' means on the pretest of vocabulary could have been zero. Thus the above mentioned conclusion as no significant difference between the two groups' means was correctly made.

It should also be noted that the assumption of homogeneity of variances was met (Levene's F = 1.37, p = .245). That is why the first row of Table 5, i.e. "Equal variances assumed" was reported.

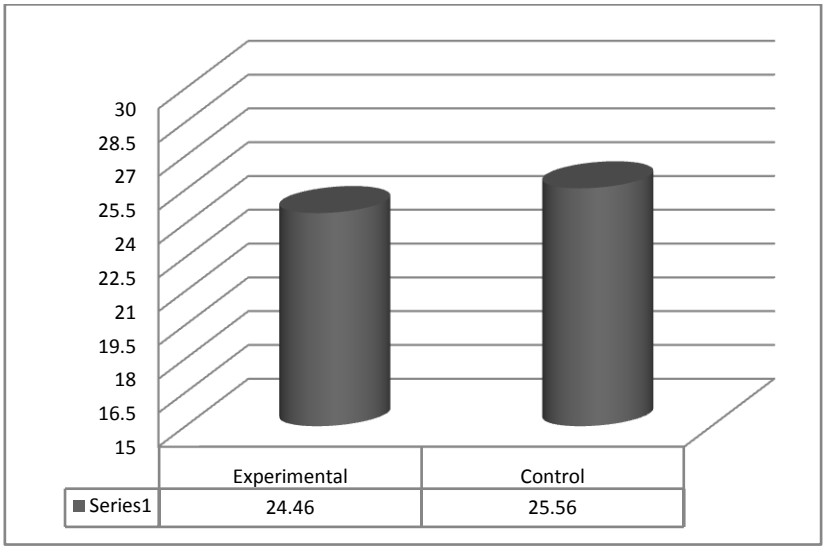

Figure 2.Pretest of vocabulary by groups

First Null-Hypothesis

A Digital game does not have any effect on Iranian Pre-intermediate EFL learners' vocabulary with a focus on gender.

An independent-samples t-test was run to compare the experimental and control groups' means on the posttest of vocabulary in order to probe the first null-hypothesis as digital games do not have any effect on Iranian Pre-intermediate EFL learners' vocabulary with a focus on gender. Based on the results displayed in Table 6 it can be claimed that the experimental (M = 30.80, SD = 5.73) had a higher mean on the posttest of vocabulary than the control (M = 27.26, SD = 6.08) group.

Table 6: Descriptive Statistics; Posttest of Vocabulary by Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
Posttest	Experimental	50	30.80	5.739	.812
	Control	50	27.26	6.084	.860

The results of the independent-samples t-test (t (98) = 2.99, p= .003, r = .289 representing an almost moderate effect size) (Table 7) indicated that there was a significant but moderate difference between the two groups' mean scores on the posttest of vocabulary. Thus it can be claimed that the first null-hypothesis **was rejected**, although the results should be interpreted cautiously due to the moderate effect size value of .289.

Table 7: Independent Samples Test; Posttest of Vocabulary by Groups

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.123	.726	2.993	98	.003	3.540	1.183	1.193	5.887

Equal variances not assumed	2.993	97.669	.003	3.540	1.183	1.193	5.887

It should also be noted that the assumption of homogeneity of variances was met (Levene's F = .123, p = .723). That is why the first row of Table 7, i.e. "Equal variances assumed" was reported.

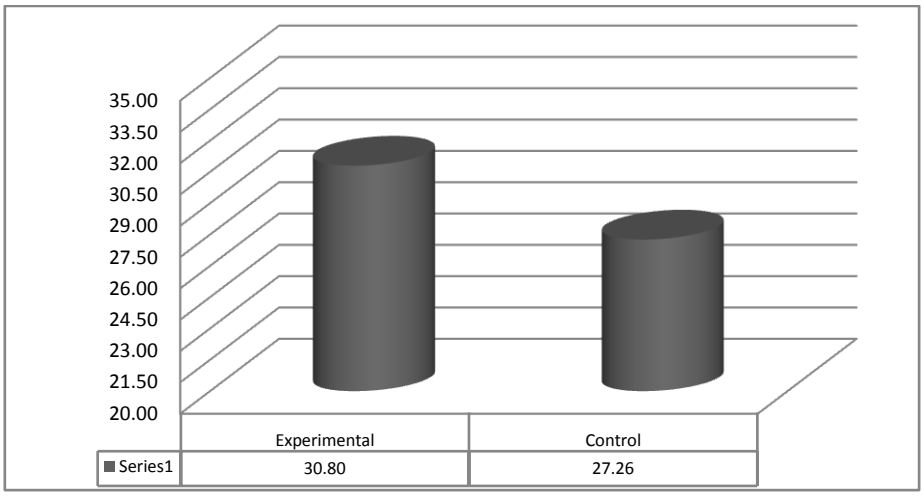

Figure 3.Posttest of vocabulary by groups

Second Directional Hypothesis

Digital games have more effect on vocabulary learning of Iranian male pre-intermediate EFL learners than female.

An independent-samples t-test was run to compare the male and female experimental groups' means on the posttest of vocabulary in order to probe the second directional hypothesis as digital games have more effect on vocabulary learning of Iranian male pre-intermediate EFL learners than females. It should be reiterated that the second hypothesis was probed on the experimental group only.

Based on the results displayed in Table 8 it can be claimed that the female group (M = 32, SD = 5.29) had a higher mean on the posttest of vocabulary than the male (M = 29.60, SD = 6.02) group.

Table 8: Descriptive Statistics; Posttest of Vocabulary by Gender (Experimental Group)

	Group	N	Mean	Std. Deviation	Std. Error Mean
Posttest	female	25	32.00	5.292	1.058
	male	25	29.60	6.021	1.204

The results of the independent-samples t-test (t (48) = 1.49, p= .141, r = .210 representing a weak to moderate effect size) (Table 9) indicated that there was not any significant difference between the two groups' mean scores on the posttest of vocabulary. Thus it can be claimed that the second directional hypothesis **was rejected.** Digital games did not have more effect on vocabulary learning of Iranian male pre-intermediate EFL learners than female.

Table 9:Independent Samples Test; Posttest of Vocabulary by Gender (Experimental Group)

	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
								Lower / Upper
Equal variances assumed	.903	.347	1.49748		.141	2.400	1.603	-.823 / 5.623
Equal variances not assumed			1.49747.221		.141	2.400	1.603	-.825 / 5.625

It should be noted that the negative 95 % lower bound confidence interval of -.823 indicated that the difference between the two groups' means on the posttest of vocabulary could have been zero. Thus the above mentioned conclusion as no significant difference between the two groups' means was correctly made.

It should also be noted that the assumption of homogeneity of variances was met (Levene's F = .903, p = .347). That is why the first row of Table 9, i.e. "Equal variances assumed" was reported.

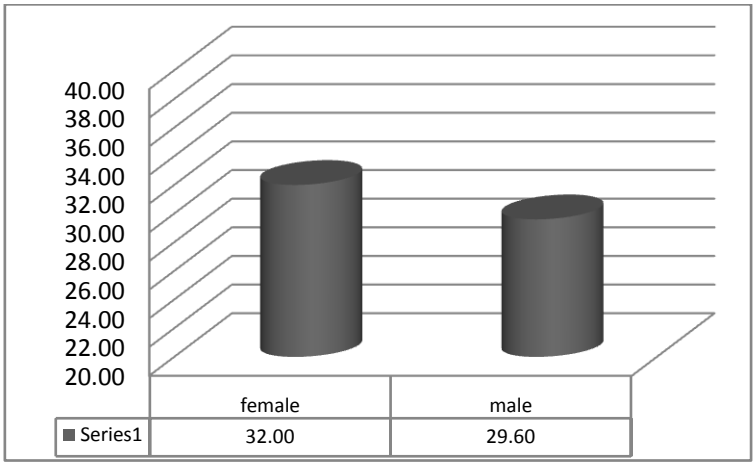

Figure 4.Posttest of vocabulary by gender (experimental group)

Table 10: KR-21 Reliability Indices

	N	Mean	Std. Deviation	Variance	KR-21
OPT	100	17.45	7.080	50.129	.88
Pretest	100	25.01	6.056	36.677	.76
Posttest	100	29.03	6.147	37.787	.81

KR-21 Reliability Indices

The KR-21 reliability indices for the OPT, pretest and posttest of vocabulary were .88, .76 and .81 respectively (Table 10).

Criterion Referenced Validity

The Pearson correlation coefficients between the pretest and posttest of vocabulary with the OPT test were calculated as criterion referenced validity indices for the former two tests. Based on the results displayed in Table 11 it can be claimed that pretest (r (98) = .84, p = .000 representing a large effect size) and posttest of vocabulary (r (98) = .87, p = .000 representing a large effect size) enjoyed significant validity indices.

Table 11: Pearson Correlations; Criterion Referenced Validity Indices

		OPT
Pretest	Pearson Correlation	.847**
	Sig. (2-tailed)	.000
	N	100
Posttest	Pearson Correlation	.874**
	Sig. (2-tailed)	.000
	N	100

**. Correlation is significant at the 0.01 level (2-tailed).

Discussion and Conclusion

CALL has proved to have many positive effects on EFL contexts. Games provide strategies for the application of CALL to SLA. For this purpose, the present study sought to investigate the effects of digital games on vocabulary learning. To this aim, as mentioned before two groups of pre-intermediate EFL learners, each comprising of 25 male and 25 female participants, were randomly selected and then the treatment group received a

digital for vocabulary learning and the control group learned the same vocabulary items through the traditional methods.

As explained before, participants were homogeneous in terms of vocabulary knowledge prior to the application of treatment. So, all the participants were almost similar in terms of vocabulary knowledge. Results of interaction of the two research variables, namely gender and treatment, also revealed that no interaction existed between the variables. In other words, these variables could be investigated separately.

First hypothesis: Digital games do not have any effect on Iranian Pre-intermediate EFL learners' vocabulary with a focus on gender.

First hypothesis was rejected according to the above and evidence was found that the treatment group performed far better on the posttest than the control group. That is, using digital games had significant positive effects on fostering vocabulary learning. So the first null hypothesis was rejected and the effect of digital games on vocabulary learning was proved. A possible reason for this can be that introduction of new vocabulary in games has been more interesting and attracting for the participants.

As mentioned in the literature, many previous studies have dealt with the application of games into SLA contexts, many of which have reported advantageous results for this. (Deubli, 2006; Nesselhauf and Tschichold, 2002). Deubli noted that digital games can engage and motivate students and present learning experiences. Moreover, other studies examined the effect of other techniques into vocabulary learning and many of many have come to similar conclusion to those of the present study. In support of the present findings, Zhang, Song and Burston (2011) found that students can learn vocabulary more effectively via e-learning techniques (mobile learning here) than with paper material. This is also supported by Lu's (2008) findings.

Second hypothesis: Digital games have more effect on vocabulary learning of Iranian male pre-intermediate EFL learners than female.

So the second hypothesis was rejected. Further, since this was a new consideration in studies of digital games, previous studies did not take account of this to the author's knowledge. Digital games did not have more effect on vocabulary learning of Iranian male pre-intermediate EFL learners than female. Thus the above mentioned conclusion as no significant difference between the two groups' means was correctly made.

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