

# Effects of Using Crossword Puzzles on Improving Spelling Among Intermediate EFL Learners

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**ABSTRACT----** *This study aimed at investigating the effects of using crossword puzzles on improving spelling among Iranian intermediate EFL learners. To determine the effects of crossword puzzles on improving spelling, 32 Iranian intermediate EFL learners were randomly selected. The data collection instruments and materials were a questionnaire for checking the participants' perceptions of using crossword puzzles for improving spelling, a spelling test administered as pretest and posttest prior to and after the treatment, and some suitable crossword puzzles designed by a software program named Crossword Forge (Version 5.3). The results revealed that using crossword puzzles did improve the EFL learners' spelling skills, and the analysis of the learners' responses to the questionnaire indicated that they had positive attitudes toward using crossword puzzles. Moreover, female learners in the experimental group benefited more than their male counterparts from the treatment to enhance their spelling.*

**Keywords---** Game, Crossword puzzles, Spelling, Intermediate EFL learner

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## 1. INTRODUCTION

Today, English is used in spoken and written forms all over the world. The users of this international language should be skillful at all four skills of this language if they want to be successful language users {1}. Most of the time, transferring information to others can only be possible via written forms due to the type of uses a language user is going to make from it. For example, to conclude a contract in English, it should be in written form, then signed and sealed by the parties taking part in it. Therefore, the language learners should also try to be a good writer apart being from a good speaker. Consequently, using efficient tools for improving language learners' writing in today world is a necessity and the requirement for writing properly is knowing correct spelling, this idea came to the mind of the researchers of this study if using crossword puzzles in the classroom can lead to the improvement of the learners' spelling.

The studies conducted so far in relation to the use of crosswords in language learning have investigated the effectiveness of using crossword puzzles on language learning in general. The number of studies investigating the effect of using crossword puzzles on improving learners' spelling which is a necessary component in writing is very few to the knowledge of the present researchers. Therefore, more studies should be conducted related to the use of crossword puzzles in the classroom and improvement of learners' spelling since the results might be helpful and valuable in the field of language teaching and learning. This study aims to answer the following research questions:

**RQ1:** Does using crossword puzzles significantly affect spelling improvement among Iranian intermediate EFL learners?

**RQ2:** Is there any significant difference between using crossword puzzles and improving spelling among Iranian intermediate EFL learners in terms of gender?

**RQ3:** What are the Iranian intermediate EFL learners' perceptions of using crossword puzzles in relation to their spelling improvement?

In line with the above research questions, the following research hypotheses were tested in this study:

**H01:** Using crossword puzzle does not significantly affect the improvement of spelling among Iranian intermediate EFL learners.

**H02:** There is no significant difference between Iranian intermediate EFL male and female learners in improving spelling using crossword puzzles.

## **2. LITERATURE REVIEW**

The following part includes history of using games, history of using crossword puzzles, and related studies on spelling:

### **2.1. History of using games**

A very common question asked by both native and non-native speakers of English language while being faced with each other in a situation in which they need to communicate together about different things or even when they want to know if their interlocutor is familiar with English language is “Can you speak English?”. They never ask each other questions such as “Can you write English or can you understand English? This while being good at English or any other language means to be skillful at its whole components and skills. Most of the time, a language speaker has to write to other foreign people in the form of letters or short messages and the like. Therefore, the need to practice learning written form is here highly felt and to be a skillful writer, one should use proper spelling and language teacher and instructors should try to find the best ways to teach spelling to their learners.

Cruickshank and Telfer {2} reported that games provide a reactive atmosphere where students quickly know how they are doing. Haun {3} suggested a number of advantages for utilizing games in the classroom, involving teaching learners substitute techniques to studying, influencing cognitive advancement, motivating learners to learn rather than memorizing, and increasing learners’ confidence when they get a right answer. Sugar and Takacs {4} pointed out that games make a communicative learning experience by converting inactive learning substance into learning experiences where the students are active members and participants.

Games for a long time have been used as effective tools in not only language learning and teaching but also other fields of science such as mathematics, geography and the like {5}. In relation to diverse styles of learning, the use of games in the classroom can be an efficient tool, particularly at the college level. Skilful and talented learners, who are the most likely to attend college, have been obtained to select games and other substitute teaching methods {6}. For some instructors, employing alternative methods of teaching may be problematic, as many instructors want to use the traditional methods they are easy with, but games can be utilized as a complement to traditional methods, not as a substitution {6}. As a point, it is important to notice that games adding flexibility to the classroom, permitting learners to regulate in the finest way in which they learn {6}. Games permit learners to work in group or in isolation, to be competitive or not, to be innovative, and to have pleasure while learning.

Ritzko and Robinson {7} discussed the use of two learning games as an educational method to involve learners in active learning. A study of learners in three undergraduate business courses was performed to investigate the efficiency and acceptance of two learning games, crossword puzzles and jeopardy, as teaching procedures. In fact, today’s college students need a more active and enjoyable learning atmosphere. They suggested that students are motivated and interested by using instructional games and these games helped in their preparation for class and tests. According to Moursund {8}, games are a form of play in which people can gain mental maturity and they provide an environment for players to learn about themselves and can interact with each other and develop some kinds of social skills. Games can be helpful to develop some skills such as thinking and problem-solving that are beneficial in non-game and game environments.

### **2.2. History of using crossword puzzles**

Bressan {9} and Wolfe {10} have tried to categorize the types of crossword puzzles according to the hints applied. Bressan {9} referred to two chief classes: direct-definition clues and hidden clues. Direct definition clues involve general, synonym, antonym, definition, and explanatory clues. Hidden clues include anagrams, vocabulary transpositions, paired meanings, and etc. Most second language puzzles apply clues from the direct-definition clues, even if hidden clues in the shape of anagrams sporadically occur. Bressan {9} discussed that crossword puzzles develop word building and orthography, and increase and evaluate the learner's knowledge of morphology.

Crossword puzzles have been illustrated to be efficient teaching tools of lexicon, spelling, definitions, and coupling key concepts with associated names, causing in more recalling and memorizing the facts {11; 12; 13; 6}. Due to the need to spell words properly to complete the puzzle, their use causes in increased attention in studying as well, and when completed, can be used more as a study tool {11; 12}.

The use of crosswords as games in the classrooms has proven to be a very useful tool in language teaching and due to their flexibility and versatility, they have been used efficiently in different disciplines {11}. Childers {14} uncovered that 96% of learners registered in a sociology course had faith in utilizing crossword puzzles was beneficial when studying sociological notions. Besides, 26% of the learners realized crossword puzzles are helpful for recognizing themes for extra study or for explanation of particular concepts. Childers {14} has proved that use of a crossword puzzle in an educational psychology class progressed memorizing, facilitated correlation of facts, and reinforced remembrance of concepts through the formation of a mental picture that associated words to concepts. Additionally, the completion of the crossword puzzle boosted topics' confidence levels and increased motivation to stud {12}.

As a study device, crossword puzzles are advantageous in recognizing parts of understanding in addition to lack of comprehension and parts of weakness {12; 13; 15}. When learners recognize replies correctly, they may have a growth in confidence {11; 12; 13; 15}. This can have a positive influence on scores, as self-efficacy has been shown to be related to implementation {36}, and gratification has been displayed to improve learning {11}. When learners have problem with the puzzles, they are stimulated to raise questions and research to realize the correct replies {13}. In general, learners discovered this method of study to be beneficial {11}, and research has illustrated crosswords to have a positive influence on learning {15}. Research has also shown that these puzzles enhance motivation and learners' attention in the subject within reach {12;13}.

### **2.3. Related studies on spelling**

Spelling is the student's ability to write a word accurately and "the way in which a word is spelled" (Merriam-Webster's collegiate dictionary, 2017). Writing true spelling increases to the quality of general writing texts. One of the mediums for teaching spelling is the use of games one of which is crossword puzzles {16}. This research gives some explanations in relation to the use of crossword puzzles on improving spelling.

Al-zuoud and Kabilan {17} studied the learners' spelling errors to recognize and facilitate the learners' spelling problems. Cook {18} declared that "unlike native speakers, students may not know the actual system of English, and will appear to use the wrong letter" (p. 1). Writing correctly is really a great challenge for both native and non-native learners. Generally, it is much bigger with the learners of English as a foreign language {19}. Based on an investigation of errors in the writing of learners of English from a series of countries, Cook {18} determined that English spelling errors can be ordered into four major kinds of spelling errors such as, omission, replacement, rearrangement and insertion errors. Even though spelling is "a sign of education" {20}, (p. 474), and though it is vital for second language learners (L2) and foreign language learners (FL), studies have demonstrated that this part has received little attention {17; 21; 22}. Subhi and Yasin {23} investigated the spelling problems and errors facing the Iraqi students who are studying English language as a necessary condition to start their academic education in Malaysian universities. For the categorization and data analysis of spelling errors in their study used Cook's classification {18}: i) Omissions (the removal of some letters), ii) Substitutions (substituting one letter with another), iii) Insertions (adding further letters), and iv), Transpositions (switching the place of letters). Al-zuoud and Kabilan {17} studied the researches that concentrated on students' spelling errors, they pointed out that a very few studies have been conducted with regard to the problems that Arab learners have in spelling.

Tsai, Hsu, Tsai, Yu, and Huang {24} have designed and put into practice a multi-part Mahjong-like spelling game to learn English vocabularies. English vocabulary is mixed with some letters to form an English vocabulary. It is a fundamental skill to successfully mix the correct letters to form a correct vocabulary in English learning. A word spelling game can involve the students to efficiently comprehend and learn English words. Mahjong is an old-fashioned Chinese game for gambling and amusement. The player tries to mix the matching tiles within a certain sequence based on the game rules of Mahjong. The tile arrangement of Mahjong is like to spell letters making a term in English vocabulary learning. The learners played the Mahjong-like spelling game to compete with other learners in interactive learning. It could involve the learning outcomes to successfully spell the correct words and to develop their spelling abilities in English terminology learning.

## **3. METHODOLOGY**

This part involves the research participants, the research instruments and materials, procedure, and results of data analysis.

### **3.1. Research participants**

The participants of this study were 32 Iranian intermediate male and female EFL learners. Since gender is an important variable in this study, the number of male and female learners should be equal, that is, sixteen male and sixteen female learners should be randomly chosen. Their age varied from 11 to 13 years old. All the learners were of Iranian

nationality and native speakers of Persian language. They were chosen from those studying English in one English language institute in Isfahan, Iran. The participants were assigned to two groups of experimental and control, 16 learners each.

### **3.2. Research instruments and materials**

The instruments and materials used for collecting data were attitude questionnaire, spelling test, Crossword Forge Software, and some suitable crossword puzzles.

#### *Attitude questionnaire:*

The answers to the questions were given based on a 5-point Likert scale varying from ‘strongly agree’ to ‘strongly disagree’. The questionnaire items were adopted from Salehi and Habibi {25} and Kalanzadeh, Shirvali vand, and Javadani Mehr {26} and then some modifications were made on the items to achieve the aims of the study. In order to validate the developed questionnaire, three experts in the field were invited to check the content of the questionnaire. Moreover, the reliability of the research-made questionnaire was calculated using Cronbach Alpha and it was reported to be 0.83. The questionnaire consisted of two parts. The first part included the demographic data, and the second part included 15 items to be answered by the learners in relation to using crossword puzzles for improving spelling.

#### *Spelling test:*

A spelling test was administered to the participants in the study as pretest and posttest. For checking the reliability of the test, 10 intermediate learners were selected randomly and the scores obtained from the test were coded and entered the SPSS (Version 22), for reliability analysis. The Cronbach’s alpha coefficient was found to be 0.83 and also the split-half reliability measure was found to be 0.81. The test consisted of two parts; the first part contained information about learner’s names, their age, and their gender that they could select it with predetermined items, and the second part consisted of 30 multiple choice items using the words incorporated in the textbook.

#### *Crossword Forge Software (Version 5.3):*

This software allowed the researchers to make ideal, high quality, and printable crossword puzzles. Moreover, this software provided this quality for users to add background pictures to make the puzzles more pleasing.

#### *Crossword puzzles:*

The crossword puzzles were designed using Crossword Forge and the words were chosen from the book taught in the English language institute.

### **3.3. Procedure**

The setting of this study was two English classrooms of an English institute located in Isfahan, Iran. Prior to administering the spelling test, a pilot study was conducted on 10 intermediate EFL learners of the same institute to check the reliability index. The Cronbach’s alpha coefficient was found to be 0.83; the split-half reliability measure was found to be 0.81 as well. In order to check the validity of the test, the researchers sent three copies of the test to three experts and they confirmed its validity. Then the participants were divided into two groups of sixteen. The experimental group received spelling teaching via using the designed crossword puzzle according to the word lists in the spelling test and the control group received the traditional method of teaching the same word list. Then, the spelling test was administered to all the participants at the end of their class when the stress level was low. This was the pretest for being aware of the learner’s performance in the spelling test before the treatment and it was administered in the first session of the learning period. The teaching time necessary to teach spelling via the two methods was around 25 days or 10 sessions. At the end of the two instructions, the spelling test was administered once again as the posttest in the 9<sup>th</sup> session. The questionnaire was administered in the 10<sup>th</sup> session to explore the learners’ perceptions of using crossword puzzles for learning spelling.

## **4. RESULTS OF DATA ANALYSIS**

The following sections give an account of the analysis of the obtained data in this study:

### **4.1. Checking the normality of the distributions**

To check the normality assumption, Shapiro-Wilk test was employed and Table 4.1 presents the test of normality of the distributions for the male and female learners in the control and experimental groups:

**Table 4.1:** Results of the shapiro-wilk’s test for checking the normality of the distributions of the two groups based on gender

Test	Group	Sex	Shapiro-Wilk		
			Statistic	df	Sig.
Pretest	Control	Male	.878	8	.181
		Female	.889	8	.230
		Total	.900	16	.082
	Experimental	Male	.948	8	.690
		female	.862	8	.126
		Total	.937	16	.310
Posttest	Control	Male	.944	8	.652
		female	.887	8	.221
		Total	.931	16	.249
	Experimental	Male	.930	8	.520
		female	.937	8	.580
		Total	.932	16	.265

The results of Table 4.1 indicated that the distribution of scores for male and female learners in the two groups of control and experimental were normal since the *Sig.* values for all these analyses were greater than .05.

#### 4.2. Comparing pretest and posttest scores of the learners in the control group (within-group analyses)

The pretest and posttest scores of the learners in the control group were compared using a paired-samples *t* test. This was done to see whether the control group learners improved (Significantly) from pretest to posttest or not. To determine if the difference between these two tests was statistically significant or not, the researchers had to check the paired-samples *t* test table below:

**Table 4.2:** Results of paired-samples t test comparing the pretest and posttest Scores of the control group

		Paired Differences					<i>t</i>	<i>Df</i>	<i>Sig.</i> (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Control	pretest - posttest	-1.938	1.569	.392	-2.774	-1.101	-4.939	15	.001

Since the *p* value under the *Sig.* (2-tailed) column in Table 4.2 was less than the significance level (i.e., .001 < .05), it could be inferred that the difference between the pretest and posttest scores of the learners in the control group was not statistically significant.

### 4.3. Comparing pretest and posttest scores of the learners in the experimental group (within-group analyses)

The pretest and posttest scores of the learners in the experimental group were compared using a paired-samples *t* test. This was done to see whether the experimental group learners improved (Significantly) from pretest to posttest or not. To find any possible differences between the pretest and posttest scores of the learners in the experimental group a paired-samples *t* test was employed:

**Table 4.3:** Results of paired-samples *t* test comparing the pretest and posttest scores of the experimental group

	Paired Differences					<i>t</i>	<i>df</i>	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
pretest - posttest	-7.813	2.639	.660	-9.219	-6.406	-11.84	15	.001

Results of paired-samples *t* test in Table 4.3 revealed that there was a statistically significant difference between the pretest and posttest scores of the learners in the experimental group.

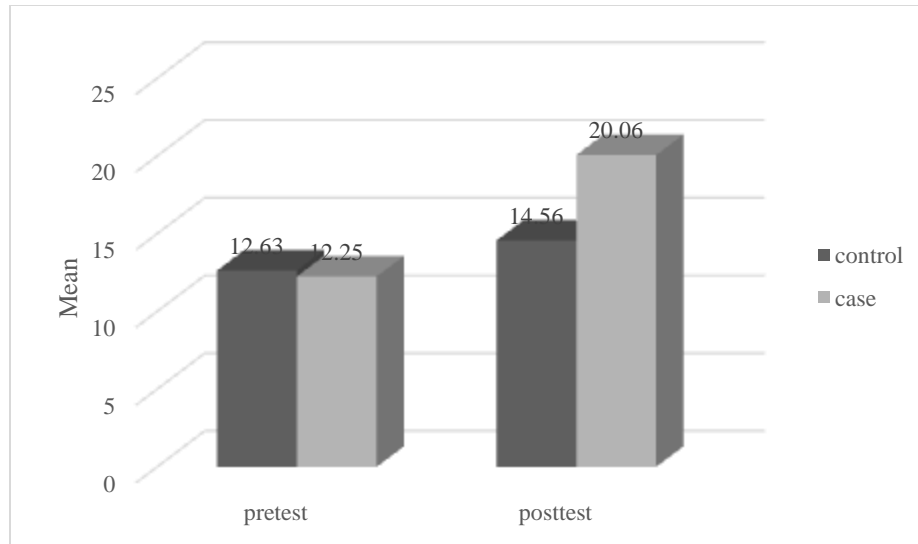
### 4.4. Comparing pretest and posttest scores of the learners in control and experimental groups

Table 4.4 shows the results of descriptive statistics comparing the pretest scores of the control and experimental groups and their posttest scores. The results of these analyses are as follows:

**Table 4.4:** Results of descriptive statistics comparing the pretest scores of the control and experimental groups and their posttest scores

	Group	<i>N</i>	Mean	<i>Std. Deviation</i>	<i>Std. Error Mean</i>
pretest	Control	16	12.63	3.86	.97
	Experimental	16	12.25	3.70	.92
posttest	Control	16	14.56	3.42	.86
	Experimental	16	20.06	4.25	1.06

On the pretest, the mean scores for control ( $M = 12.63$ ) and experimental ( $M = 12.25$ ) group learners were not considerably different. However, the posttest mean score of the control group ( $M = 14.56$ ) greatly differed from that of the experimental group ( $M = 20.06$ ). This is also graphically represented in Figure 4.1 below:



**Figure 4.1:** Pretest and Posttest Mean Scores of the Control and Experimental Groups

It is clear in the bar graph that the two groups were almost equal on the pretest, but the experimental group considerably outperformed the control group on the posttest. To find if the difference between the pretest scores of the two groups and between their posttest scores had been statistically significant or not, the following table should be consulted:

**Table 4.5:** Results of independent-samples t test comparing the pretest and posttest scores of the control and experimental groups

	<i>t</i>	<i>df</i>	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Pretest	.281	30	.781	.375	1.337	-2.355	3.105
Posttest	-4.031	30	<.001	-5.500	1.365	-8.287	-2.713

The results of Table 4.5 show that there was no significant difference between the pretest scores of the two groups ( $p = .78$ ), but their posttest scores were significantly different ( $p < .001$ ) in favor of the experimental group. This difference in the posttest scores of the learners in the control ( $M = 14.56$ ) and experimental ( $M = 20.06$ ) groups could be attributed to the treatment to which the experimental group learners were exposed.

#### 4.5. Comparing the mean gain scores of the male and female learners in control and experimental groups (examining gender differences)

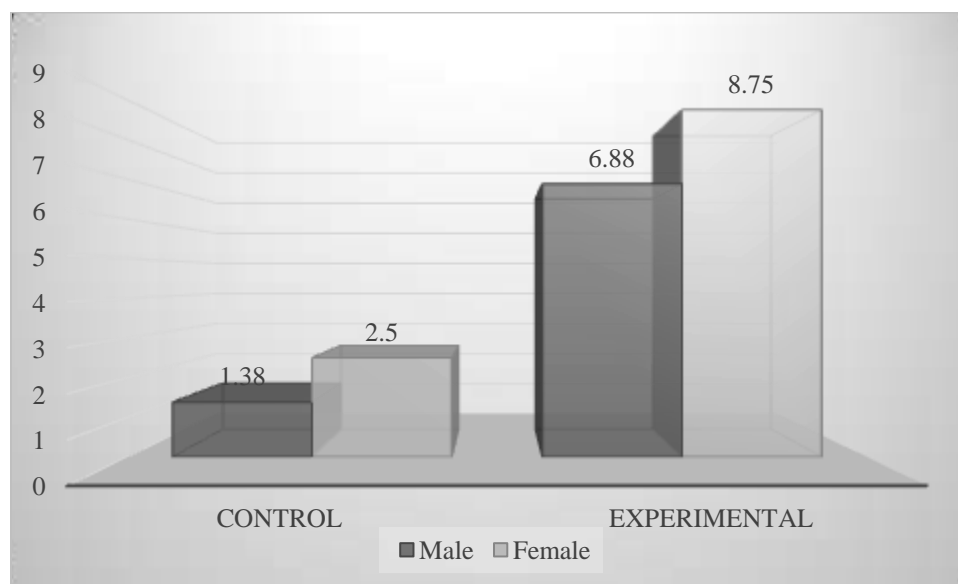
Based on the information presented in Table 4.6, the mean gain score of the male learners in the control group was 1.38 and that of females was 2.50. The  $t$  test analysis showed no significant difference between the gain scores of the male and female learners in the control group ( $p = .15$ ).

As for the experimental group learners, the mean gain score of the male learners equaled 6.88, while the corresponding value for female learners was 8.75. The difference between the gain scores of male and female learners in the experimental group was not found to be statistically significant because the  $p$  value exceeded the significance level (i.e.,  $.16 > .05$ ). That is, female learners in the experimental group benefited more than their male counterparts from the treatment (i.e., using crossword puzzles) to enhance their spelling.



**Table 4.6:** Results of comparing male and female learners’ gain scores in control and experimental groups

Group		sex	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Control	Difference (posttest-pretest)	male	8	1.38	2.00	-1.491	14	.158
		female	8	2.50	.76			
Experimental	Difference (posttest-pretest)	male	8	6.88	2.36	-1.476	14	.162
		female	8	8.75	2.71			



**Figure 4.2:** Mean Gain Scores for Male and Female Learners in Control and Experimental Groups

Figure 4.2 shows that in the control group, the difference between male and female learners was not very noticeable; however, in the experimental group, female learners had a significantly higher mean score than their male peers.

#### 4.6. Learners’ attitudes towards the treatment

The table below shows the frequencies and percentages of the responses to each questionnaire item:

**Table 4.7:** Frequency and percentage of the responses to the attitude questionnaire items

Items	‘Strongly agree’ & ‘Agree’		‘No idea’		‘Strongly disagree’ & ‘Disagree’		Mean
	Freq.	Percent	Freq.	Percent	Freq.	percent	
1	16	100	0	0	0	0	4.69
2	16	100	0	0	0	0	4.56
3	16	100	0	0	0	0	4.44
4	16	100	0	0	0	0	4.44
5	16	100	0	0	0	0	4.44
6	16	100	0	0	0	0	4.31
7	15	93.75	1	6.25	0	0	4.25



8	14	87.5	2	12.5	0	0	4.37
9	12	75	4	25	0	0	4.06
10	14	87.5	2	12.5	0	0	4.25
11	11	68.75	5	31.25	0	0	3.94
12	13	81.25	3	18.75	0	0	4.31
13	14	87.5	2	12.5	0	0	4.56
14	16	100	0	0	0	0	4.69
15	14	87.5	2	12.5	0	0	4.56

Table 4.7 shows that 14 out of 15 items in the questionnaire had mean scores above 4.00 (which is the value for the Agree option in the questionnaire). Thus, it could be understood that the learners held positive attitudes towards the treatment (i.e., using crossword puzzles helps them to improve their spelling).

The highest mean scores in Table 4.7 belonged to items 1 and 14, while the lowest mean scores were those of items 2 and 11. Hence, the learners showed the highest degree of agreement with the statements in item 1 (Using crossword puzzles helps me to improve my spelling) and item 14 (Learning the spelling of the often-misspelled words is effective by using crossword puzzles). On the other hand, they demonstrated the lowest degree of agreement with item 2 (Using crossword puzzles in class is fun and enjoyable) and 11 (Crossword puzzle increases the chance of having a more accurate spelling).

## 5. DISCUSSION AND CONCLUSIONS

This part presents discussion and general conclusions which can be drawn from the analysis of the obtained data and the following research questions were answered:

### 5.1. Addressing research question one

To find any possible differences between the two groups and to make comparisons between them, the pretest and posttest scores of the learners in the control group were compared using a paired-samples *t* test. Additionally, another paired-samples *t* test was conducted to capture any possible differences between the pretest and posttest scores of the learners in the experimental group. Finally, an independent-samples *t* test was applied and the results revealed that there was a statistically significant difference between the pretest and posttest scores of the learners in the experimental group.

The findings of the study were in line with the results of the research reported by {16} who conducted an action research in relation to the use of crossword puzzles for improving learners' spelling. The results of her study showed that using crossword puzzles for improving learners' spelling is a useful action. Williams {27} conducted a study using his own crossword puzzles and those selected from other sources in relation to the use of crossword puzzles as a revision technique for the learners before exams. Those using the technique completely found that their scores and performance were little by little on the demand.

In another study, crossword puzzles have been applied as a teaching technique in disciplines like communication {3}, psychology {12}, health {29}, and reading {30}, causing in better retention of facts and association notions and concepts, along with increased levels of confidence. Specifically, crosswords are beneficial in reinforcing definitions and spelling of words (Hyde, 1983), which are reflected to be an essential skill in the biological sciences.

The findings of the study were also consistent with other studies in which crossword puzzles have been illustrated to be efficient teaching tools of lexicon, spelling, definitions, and coupling key concepts with associated names causing in more recalling and memorizing the facts {11; 12; 13; 6}. Due to the need to spell words properly to complete the puzzle, their use causes in increased attention in studying as well, and when completed, can be used more as a study tool {11; 12}.

The findings were; therefore, in line with the study conducted by Davis, Shepherd, and Zwiefelhofer {30}, in relation to the use of crossword puzzles as an aid in the success of student learning. The results of their study showed that the learners' scores in the first class after receiving crossword puzzles to use for review were improved but in the second class a decrease in the exam scores after using crossword puzzles was observed.

The findings also confirmed the results of the study conducted by Njoroge, Ndung'u, and Gathigia {31} indicating that the usage of crossword puzzles in the teaching of vocabulary in English as a Second Language (ESL) was efficient and consequently impacts performance. The statistics showed that the students who were exposed to the crossword puzzles tactic did much better in the posttest than their partners who trained through traditional lexical instruction style. This result suggested that the use of crossword puzzles may have supported the development of performance since at the pretest phase, both groups' marks were alike.

Nearly all the reported findings similar to the findings of this study put remarkable emphasis on the effectiveness of using crossword puzzles on improving language skills, specially spelling. Thus, the first question can be answered in a way that using crossword puzzle significantly affect the improvement of spelling among Iranian intermediate EFL learners.

## **5.2. Addressing research question two**

To answer the second question and explore the difference between using crossword puzzle and improving spelling in terms of gender, the *t* test analysis showed no significant difference between the mean scores of the male and female learners in the control group. Female learners in the experimental group benefited more than their male counterparts from the treatment (i.e., using crossword puzzles) to enhance their spelling. In the control group, the difference between male and female learners was not very noticeable; however, in the experimental group, female learners had a significantly higher mean score than their male peers.

The results of the study pointed to a significant difference between the mean scores of the male and female learners in the experimental group but there is no study related to the effects of using crossword puzzles on improving spelling in terms of gender and there was no significant difference between male and female in these studies or gender did not considered as a variable in them; however, there are some studies related to spelling and writing in which gender differences were investigated.

The findings of the study were in the line with the results of the research conducted by Allred {35}, gender differences in spelling achievement were explored for students in Grades 1 through 6. Performances of boys and girls on standardized and written spelling exams were assessed. Students from high-, medium-, and low-achieving schools in six geographic regions of the United States took both a proofreading-type standardized exam and a written spelling exam that included the same words (N = 3, 024). Analyses of variance were performed on average divergences across both exams by sex for each grade for all matters. A physical computation also was made for both sexes on each word on both tests. Girls scored significantly higher (all *p* values > .001), causing in the conclusion that girls spell better than boys at all grade levels on both types of tests.

The findings of the study supported some relevant studies such as the study conducted by Berninger, Nielsen, Abbott, Wijsman, and Raskind {32}, gender differences in mean level of reading and writing skills were investigated in 122 children (80 boys and 42 girls) and 200 adults (115 fathers and 85 mothers) who revealed behavioral markers of dyslexia in a family genetics research. Gender differences were uncovered in writing and reading and the results showed that men and boys were more impaired in handwriting and composing than were women and girls, but men were also more impaired in spelling than women. Men were more impaired than women in correctness and rate of reading texts orally, but boys were not more impaired than girls on any of the reading measures. Males were constantly more impaired than females in orthographic skills, which may be the cause of gender differences in writing, but not motor skills.

Therefore, the second question can be answered in a way that there is a significant difference between Iranian intermediate EFL male and female learners in improving spelling using crossword puzzles.

## **5.3. Addressing research question three**

To answer the third question, some 15-item questionnaires were filled out by the learners in the experimental group. Analyzing the responses, it was revealed that the learners held positive attitudes towards the treatment (i.e., using crossword puzzles helps them to improve their spelling). In order to make sure this positive attitude was of statistical significance, the highest mean scores belonged to items 1 and 14, while the lowest mean scores were those of items 2 and 11. Hence, the learners showed the highest degree of agreement with the statements in item 1 (Using crossword puzzles helps me to improve my spelling) and item 14 (Learning the spelling of the often-misspelled words is effective by using crossword puzzles). On the other hand, they demonstrated the lowest degree of agreement with item 2 (Using crossword puzzles in class is fun and enjoyable) and item 11 (Crossword puzzle increases the chance of having a more accurate spelling).

The findings of the study supported some relevant studies such as the study conducted by Franklin, Peat, and Lewis {13}, on using crosswords as a medium of language teaching, it was found that crossword puzzles will lead to the increase of

motivation and interest concerning the selected topic to be taught among the learners. Childers {14} also showed that the use of the crosswords boosted learners' self-confidence in their ability, helped them in comprehending some of the concepts and motivated them to think about what they were learning.

The findings of the study were in the line with the results of the research reported by Cruickshank and Telfer {2} that games provide a reactive atmosphere where students quickly know how they are doing. Haun {3} suggested a number of advantages for utilizing games in the classroom, involving teaching learners substitute techniques to studying, influencing cognitive advancement, motivating learners to learn rather than memorizing, and increasing learners' confidence when they get a right answer. Hequet {33} has indicated that the game should concentrate on an exact learning problem. He used games to address several learning problems including motivating students to be prepared for class, addressing student misunderstandings of content and evaluating learner comprehending of material. Vos, van der Mijden, and Denessen {34} demonstrated the benefits of making versus playing an instructive game on the learner motivation and deep learning.

Based on the result of analyzing the questionnaire, it was uncovered that using crossword puzzles helps learners to improve their spelling. Learning the spelling of the often-misspelled words is effective by using crossword puzzles and crossword puzzles can be helpful and beneficial for improving language skills like spelling. Moreover, they can motivate learners to learn spelling better; therefore, the third question was answered.

As the findings of a great number of previous studies indicated, crossword puzzle plays a central role in the process of learning a foreign language. The results of this study uncovered that by using and applying crossword puzzle in classes, the learners' spelling will be improved significantly. Accordingly, learners' attitudes towards using crossword puzzles for improving spelling were positive. Thus, L2 teachers are strongly recommended to apply crossword puzzles in L2 classes improving the learners' spelling and enhancing motivation and interest of L2 learners. Crossword puzzles are beneficial games for improving spelling in this study and the results are helpful and valuable in the field of language teaching and learning.

## 6. IMPLICATIONS AND SUGGESTIONS

Like most of the studies, this study is not separate from other studies and it is not an exception, and there are some limitations in this study as follows:

- Lack of sufficient time to conduct the study in a longer period of time.
- Implementation of the study on limited number of the participants.
- Performance of the study in only one language institute.
- Finding and convincing the institute owner to permit the researchers not to exactly follow the syllabus objectives dictated by the institute.

This study mainly focused on application of crossword puzzles for improving spelling among Iranian intermediate EFL learners; therefore, the following research areas can be recommended to those who are interested in pursuing the same line of research:

- The same variables can be examined with learners with different proficiency levels.
- Further researches can be conducted to examine the mentioned variables in relation to other language skills.
- Other affective factors such as self-efficacy, self-esteem, motivation, self-concept, and risk taking can be investigated in other studies.

## 7. REFERENCES

- {1} Ratnawati, N., Bindarti, E. W., & Rofiq, A. (2013). The effect of using crossword puzzle on vocabulary achievement of the English year students at SMP Negeri 5 Jember. ©*Pancaran*, 2(2), 23-32.
- {2} Cruickshank, D. R., & Telfer, R. (1980). Classroom games and simulations. *Theory into practice*, 19(1), 75-80.
- {3} Haun, M. W. (1985). Parliamentary Puzzles as a Teaching Methodology. *Parliamentary Journal*, 26(3), 95-99.
- {4} Sugar, S., & Takacs, G. (1999). Games that teach teams: Tale of the RAT. *The Journal for Quality and Participation*, 22, 54-55.
- {5} Paul, D. (2003). *Teaching English to children in Asia*. Longman
- {6} Moore, L. S., & Dettlaff, A. J. (2005). Using educational games as a form of teaching in social work. *Arete-Columbia South Carolina*, 29(1), 58-72.

- {7} Ritzko, J. M., & Robinson, S. (2011). Using games to increase active learning. *Journal of College Teaching & Learning (TLC)*, 3(6).
- {8} Moursund, D. G. (2006). *Introduction to using games in education: A guide for teachers and parents*.
- {9} Bressan, D. (1970). Crossword puzzles in modern language teaching. *Audio-Visual Language Journal*, 8(2), 93-95.
- {10} Wolfe, D. E. (1972). Teacher-made crossword puzzles. *Audio-Visual Language Journal*, 10(3), 177-181.
- {11} Childers, C. D. (1996b). Using crossword puzzles as an aid to studying sociological concepts. *Teaching Sociology*, 24(2), 231-235.
- {12} Crossman, E. K., & Crossman, S. M. (1983). The crossword puzzle as a teaching tool. *Teaching of Psychology*, 10(2), 98-99.
- {13} Franklin, S., Peat, M., & Lewis, A. (2003). Non-traditional interventions to stimulate discussion: the use of games and puzzles. *Journal of Biological Education*, 37(2), 79-84.
- {14} Childers, C. D. (1996a). Game-display board activities for science teaching. *Teaching Sociology*, 24, 231-235.
- {15} Weisskirch, R. S. (2006). An analysis of instructor-created crossword puzzles or student review. *College Teaching*, 54(1), 198-201.
- {16} Diniyati, N. (2009). *THE USE OF CROSSWORD PUZZLES TO IMPROVE STUDENTS' SPELLING (An Action Research of Fourth Grade Students of SDN Cokro, Grabag Kabupaten Magelang in the Academic Year of 2008/2009)* (Doctoral dissertation, Universitas Negeri Semarang).
- {17} Al-zoud, K. M., & Kabilan, K. M. (2013). Investigating Jordanian EFL students' spelling errors at tertiary level. *International Journal of Linguistics*, 5(3), 164-176.
- {18} Cook, V. J. (1999). Teaching spelling. Retrieved May, 17, 2015 from <http://privatewww.essex.ac.uk/~vocook/OBS2O.htm>.
- {19} Muslim, I. M. (2014). Helping EFL students improve their writing. *International Journal of Humanities and Social Science*, 4(2), 105-112.
- {20} Cook, V. J. (1997). L2 users and English spelling. *Journal of Multilingual and Multicultural Development*, 18(6), 474-488.
- {21} Bebout, L. (1985). An error analysis of misspellings made by learners of English as a first and as a second language. *Journal of psycholinguistic research*, 14(6), 569-593.
- {22} Haggan, M. (1993). Actual and self-perceived spelling accuracy in Kuwaiti EFL students: Some practical and theoretical implications. *TESL Canada Journal*, 10(2), 55-70.
- {23} Subhi, S. N., & Yasin, M. S. M. (2015). Investigating Study of an English Spelling Errors: A Sample of Iraqi students in Malaysia. *International Journal of Education and Research*, 3(6), 235-246.
- {24} Tsai, C. Y., Hsu, J. M., Tsai, H. H., Yu, P. T., & Huang, W. F. (2016). A multi-party Mahjong-like spelling game for English vocabulary learning. *International Journal of Innovation and Learning*, 19(4), 397-411. doi: <http://dx.doi.org/10.1504/IJIL.2016.076795>. Online ISSN: 1741- 8089.
- {25} Salehi, H., & Habibi, S. B. (2015, September). EFL Learners' Attitudes towards Using Thesaurus Part of Microsoft Word in Vocabulary Acquisition. In 1st International Conference on Teaching & Learning (ICTL) (Vol. 14, p. 61). September 2015, Langkawi, Malay.
- {26} Kalanzadeh, G. A., Vand, S. S., & Mehr, H. J. (2014). Perspectives Of Iranian Secondary School Teachers Towards The Application Of Interactive Whiteboards Technology In English Language Classes. *International Journal of Language Learning and Applied Linguistics World*, 15.
- {27} Williams, D. (2007). A unique review strategy that motivates student learning. *Insight: A Collection of Faculty Scholarship*, 2, 64-69.
- {28} Damrosch, S. (1994). A qualitative challenge. *Qualitative Health Research*, 4(1), 72-73.
- {29} Hyde, H. (1983). Switched on to crosswords. *Australian Journal of Reading*, 6, 193-198.
- {30} Davis, T. M., Shepherd, B., & Zwiefelhofer, T. (2009). Reviewing for Exams: Do Crossword Puzzles Help in the Success of Student Learning. *Journal of Effective Teaching*, 9(3), 4-10.
- {31} Njorge, C. M., Ndung'u, W. R., & Gathigia, G. M. (2013). The use of crossword puzzles as a vocabulary learning strategy: A case of English as second language in Kenyan secondary schools. *International Journal of Current Research*, 5(1), xxx-xxx, xxxxxx.
- {32} Berninger, V. W., Nielsen, K. H., Abbott, R. D., Wijsman, E., & Raskind, W. (2008). Gender differences in severity of writing and reading disabilities. *Journal of School Psychology*, 46(2), 151-172.
- {33} Hequet, M. (1995). Games that Teach. *Training*, 32(7), 53-58.
- {34} Vos, N., van der Mijden, H. & Denessen, E. (2011). Effects of constructing versus playing an educational game on student motivation and deep learning strategy use. *Computers and Education*, 56, 127-137.
- {35} Allred, R. A. (1990). Gender differences in spelling achievement in grades 1 through 6. *The Journal of Educational Research*, 83(4), 187-193.

- {36} Cassidy, S. (2004). Learning styles: An overview of theories, models, and measures. *Educational psychology*, 24(4), 419-444.
- {37} Spelling. (2017). In Merriam-Webster Online. Retrieved February 1, 2017, from <https://www.merriam-webster.com/dictionary/spelling>