

# The Effect of Jigsaw Technique on Reading Comprehension and Anxiety of EFL Learners: The Case of Intermediate Iranian Learners

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## Abstract

### 1.

#### 1.1.1. *The processes of instruction in the control group (CG)*

The researchers started with 40 intermediate students from both adults, adolescents, males and females. Then, a text from Oxford Intermediate Reading Comprehension textbook was selected. Afterwards, the researchers distributed the reading text, so that each person had all the parts of reading. The instructor asked the students to read the text individually and translate the text sentence by sentence. At the end of the instruction, the students responded to the reading comprehension questions individually.

#### 1.1.2. *The processes of instruction in the experimental group (EG)*

At the first step, the researchers focused on 60 intermediate students and divided them into small cooperative jigsaw groups (i.e., 3-6 persons in each group). The instructor asked the students to make circles with their chairs. Then, a reading text from the same source was assigned for the experimental group. Afterwards, the pieces of reading texts were cut out into separate paragraphs and were distributed among the students so that each person had a different part of reading paragraph. The instructor asked each member of the cooperative jigsaw group to silently read the assigned text. The time allocated for this stage was 5-10 minutes.

In the second step, the instructor created new small (2-3) persons “Expert” groups with the individuals who had read the same material. The students were given time to discuss what they had read and how they might treat this when they return to their cooperative groups. This time, the allocated time was 5-10 minutes.

In the third step, the instructor recreated the original cooperative jigsaw groups. Then, she had each person explain the content of the reading text to the rest of the group. In other words, the students shared knowledge, ideas, and information in terms of pieces of the text which they had in their hands. In this part, each member of the “expert group” took responsibility and shared their information with the members of the other group, so that they could have access to the whole text, sentence by sentence, and were able to reorganize it. Each member of the group then cooperated with the rest of the group regarding the content and the subject matter. Each person in the group was also responsible to learn from the others inside the group. Five minutes was allocated to this activity.

In the fourth and the last step, the instructor concluded with several key questions for students to discuss implications of the points with people either within the groups or with the entire class. A number of oral questions based on the reading text were asked to ensure that individuals had grasped the overall content. During this step, each person had all of the pieces of the whole text in his/her hand.

**The Effect of Jigsaw Technique on Reading Comprehension and Anxiety of EFL Learners: The Case of Intermediate Iranian Learners**

## Abstract

English as a foreign language (EFL) learners face persistent difficulties in comprehending English texts and become frustrated as a result. General second language (L2) anxiety, as well as L2 reading anxiety are believed to contribute to this problem. Jigsaw Reading Technique (JRT), a subcategory of cooperative learning techniques was introduced for the purpose of handling this type of L2 reading anxiety (Aronson, 1971). The present study pursued a true experimental design for the purpose of examining this technique at our own setting; data collection procedure comprised quantitative and qualitative assessments. The aim was to investigate the effect of JRT on reading comprehension and anxiety of EFL intermediate Iranian learners. Moreover, the study questioned any probable difference across adults and adolescents in their benefits from JRT. Around 205 Iranian EFL learners took Oxford Quick Placement Test (OQPT), on the basis of which 135 intermediate learners were chosen as the study sample. The participants were randomly assigned to a control group (CG) and an experimental group (EG). The instrumentation was pre- and post-tests for assessing reading performance and two questionnaires of an EFL Reading Anxiety Inventory (EFLRAI) and students' attitudes of JRT were answered and assessed. The results indicated that the EG outperformed the CG in their reading comprehension performance. Moreover, EG participants' L2 reading anxiety decreased significantly after the treatment. There was no significant difference between the two age groups (adults and adolescents) as far as their benefits from the JRT was concerned.

**Keywords:** *Cooperative learning; Intermediate EFL Learners; Jigsaw Reading Technique; Reading anxiety; Reading comprehension*

## INTRODUCTION

Anxiety and stress may actually deteriorate reading performance (Mohammadpur & Ghafournia, 2015). Anxious students generally refuse to participate in group and pair work activities. Accordingly, their passive behavior is a drawback to pedagogical cooperation and advancement. However, methods have been found to be effective in teaching reading comprehension. The teachers can use eclectic mixtures of cooperative or group learning, graphic organizers, asking and answering questions, story structure, summarizing, or focusing on vocabulary (Pang, 2003).

Tamah (2011) questioned the efficiency of traditional reading techniques in that students have complete access to the entire text and they do not treat the text analytically to search for topics and components. Secondly, students are not challenged to consult guides and figure out the points after sharing ideas with others. Thirdly, students are not provided with a chance to discover the points in a trial and error form. Moreover, no serious need is felt to reorganize other people's culture views and norms since every part of the text is readily at hand. In the same vein, taking part in cooperative activities such as Jigsaw Technique, provides the chance for students to increase self-confidence and get acquainted with different personality types among the other students. Occasionally, students are reluctant to have group or pair work activities with other individuals. Studies have shown that numerous factors contribute to students' reluctance for cooperative activities which are out of the scope of this study, nevertheless, whatever the cause may be, there is no doubt that for developing students' reading comprehension, reducing reading anxiety is a point of very high significance. Since the traditional teaching methods are not adequate for understanding the reading text, the researchers of this study examined the effect of using Jigsaw Technique to improve students' success in reading. Expectantly, the outcomes of this study will lead the teachers to implement cooperative jigsaw approaches in their training. Lai (2010) elaborates that some individuals continually consider doing jigsaw reading as playing around with a puzzle. Moreover, Gallardo, Guerrero, Collazos, Pino, and Ochoa (2003) maintains that jigsaw can seriously contribute to creative learning, as it is planned on a face-to-face basis leading to group interaction. Suyanto (2012) argues that the application of Jigsaw Technique can make students more responsible in the teaching learning procedure. Hence, they participate in understanding a problem and answering it together in a group, dynamically and directly. The findings of this study may contribute to innovative insights in the area of JRT and cooperative reading and learning, and it may combine the findings in the related literature. During this study, the researchers have conducted Cooperative-Based (Jigsaw-Based) technique within the analysis so as to eliminate those common drawbacks in reading comprehension through applying Jigsaw Technique. Also, instructors can benefit from the findings of this

research through fortifying their students' L2 reading comprehension, in terms of JRT. This study tends to overcome one of the barriers which impede reading comprehension, and to raise students' self-confidence and self-esteem. It also aims at teaching them to act interactively and develop a cooperative style of learning. More specifically, the main purpose of this study is to find out, whether by implementing Jigsaw Technique, students would be more capable of accomplishing their goals and increasing their reading comprehension. Moreover, the researchers attempted to discern whether Jigsaw Technique can decrease students' reading anxiety, significantly, and to analyze the degree of cooperation and collaboration among them.

In order to investigate the above-mentioned purposes, the following four research questions were formulated. Throughout this study, the researchers attempted to gather data and statistical evidence to answer these four questions:

RQ1. Does Jigsaw Technique practically improve learners' reading comprehension?

RQ2. Is there any difference across the probable benefits, which adults and adolescents draw from this technique?

RQ3. Does Jigsaw Technique contribute to the reduction of reading anxiety?

RQ4. What is the overall attitude of the learners towards Jigsaw Technique?

## REVIEW OF THE RELATED LITERATURE

### Reading Comprehension

Three elements, viz text, reader, and context have shaped up the existing literature regarding reading comprehension. Pearson and Cervetti's (2016) argument illustrates that reader, text, and context constitute a three-phase model which describes reading comprehension. Based on Al Udaini (2011), reading is a collaborative process in which the reader connects by the text and involve his/her ability and information to get a sense. Reading comprehension is predominantly developed through reading intended passages and subsequently answering the relative questions (Collins, 2019). According to Kimberly (2017), the heart and soul of reading is comprehension. She further maintains that reading comprehension is a dynamic process in which information from the context and knowledge possessed by the reader interact to yield construction of meaning both during and after reading (Kimberly, 2017). In the same vein, Kirmizi (2010) points out that the ultimate goal of reading instruction is to enable learners reach comprehension of the written material and pick up the content as intended by the writer (as cited in Keshta, 2016). Reading comprehension requires significant ability; accordingly, McKee (2012) claims that reading comprehension refers to an intricate and numerous task capability. According to Snow (as cited in Rassaei, 2015), the process of reading comprehension is taking out and making sense through communication and participation with the written language. Similarly, Keshta (2016) considers reading comprehension as the skill of comprehending or acquiring meaning from any type of written material.

### Foreign Language Reading Anxiety (FLRA)

Foreign language reading anxiety refers to anxious or demanding emotion related to learning or practicing reading. Second language reading anxiety is in line with the common foreign language learning anxiety. Nevertheless, L2 reading anxiety is considered to be highly affected by particular characters and personality types (Saito, Horwitz, & Garza, 1999; Sellers, 2000; Zhao, 2009). Zhou (2017) pointed out that reading anxiety is the worriedness that learners experience while they are reading in their new target language. Saito, Horwitz, and Garza (1999) elaborate that it can be affected by unacquainted writings and script structures, or social material. Saito et al. (as cited in Zoghi, 2012) declared that "foreign language reading anxiety is a distinct type of anxiety that is experienced by L2 learners as a result of actual problems in text processing rather than the reading problems stemming from anxiety reactions" (p. 215). Commonly, reading anxiety might inhibit ordinary second language improvement as it interferes with the process of obtaining, remembering and using the reading tactics. Based on Saito et al. (1999), two central features that provoke foreign language reading anxiety is: unaccustomed writing system and unacquainted culture

(as cited in Sheikh Ahmad, Al-Shboul, Sahari Nordin, Abdul Rahman, Burhan & Madarsha, 2013). While learners read texts in a foreign language, they are trying to decode unfamiliar scripts and the writing system and make sense of cultural issues. Hence, they struggle with the text, and may get unsatisfied which causes nervousness. Therefore, the anxiety produced by reading in a foreign language might lead to poor language achievement (as cited in Genç, 2016).

### **Cooperative Learning (CL)**

Cooperative learning is a form of active learning where learners work together to perform specific tasks in a small group (Lewis, 2019). According to Richards and Schmidt (2010) cooperative learning is a method of instruction and learning in which school rooms are prepared in a way to allow learners work together in small support teams. Christison (as cited in Fu, 2013) explains CL as “a strategy for the classroom that is used to increase motivation and retention, to help learners develop a positive image of self and others in order to provide a device for critical thinking and problem solving and to encourage cooperative social skills” (p.140).

### **Cooperative Learning Types**

According to Farzaneh and Nejadansari (2014), cooperative learning includes a diversity of instructional methods and techniques, including Jigsaw technique. Johnson and Stanne (as cited in Farzaneh & Nejadansari, 2014) maintain that techniques such as Group Investigation (GI), Three-Step Interview, Student-Team-Achievement-Divisions (STAD), Academic Controversy (AC), and Teams-Games-Tournaments (TGT) have been mostly considered in the literature. Johnson and Johnson (as cited in Fu, 2013) illuminate the notion of CL by declaring that in the co-operative classroom collaboration is regarded as affirmative objective interdependence on individual responsibility. Duplass (as cited in Farzaneh & Nejadansari, 2014) believes that cooperative learning subsumes eight primary resources: 1) teacher supervision, 2) heterogeneous groups, 3) positive interdependence, 4) face-to-face interaction, 5) individual accountability, 6) social skills, 7) group processing, and 8) evaluation. Correspondingly, Richards and Schmidt (2010) state that there are five types of cooperative learning activities: 1. Peer Tutoring; 2. Jigsaw; 3. Cooperative Project; 4. Cooperative/Individualized; 5. Cooperative Interaction.

### **Jigsaw Reading Technique (JRT)**

Jigsaw reading is a modified version of the general Jigsaw Technique. Jigsaw reading is similar to playing a jigsaw puzzle. Individually students in a group are given part of the story or text to read. Students have to read and understand everything by him/herself to report to other participants of the group. After each member has reported the dissimilar portions of the story or text the group together reorganizes the portions to improve the original story. A reading text is cut into sections in jigsaw reading technique to comprehend the text and the students' duty is to reproduce it to its appropriate order. It can accomplish a great deal of communicative collaboration if students debate the decisions on how to order the pieces of the text. Esnawy (as cited in Dwiniasih & Nugraha, 2019) stated that jigsaw is used for reading and introducing research thesis writing, but it can be used with any reading passage in any teaching circumstance.

### **The Objective of Jigsaw Reading**

The objective of the jigsaw reading is to improve reading abilities and interaction skills and enhance cooperative learning. Also, since student's conception is the crucial aim of jigsaw, one other objective of jigsaw reading is to encourage the student's mind to consider innovatively and spontaneously. It also inspires collaboration among participants of the group to answer the solution. Students cannot have completed the task effectively if they did not cooperate (Marleni, 2016). To sum up, the objective of Jigsaw Technique is to increase self-confidence, responsibility, and cooperation such as teamwork or sharing ideas and information among the students.

### **Benefits of the Jigsaw Reading Technique**

Aronson (2008) states that jigsaw CL technique not only improves individual and group responsibility but

encourages collaboration across groups. Similarly, in addition to developing teamwork skills and increasing the depth of knowledge, Mengduo and Xiaoling (2010) have determined that the jigsaw classroom also reduces learners' anxious feelings and encourages self-esteem and self-confidence. As specified by Parmadyani (2013), Jigsaw Technique provides a natural system in which students can presenting individual accountability, leading communication, and using discussion skills across groups. In the same way, Astane and Berimani (2014) have added that one of the primary advantages of the jigsaw method is that it creates a kind of team atmosphere among the groups, which is more acceptable to peers. Respectively, Hamzah Alamri, (2018) has concluded four benefits of Jigsaw Technique. First, it allows students to form various groups containing unlike races and cultures to accomplish specific academic goals. Second, it offers particularly cooperating learning involvements and activities. Third, it develops students' higher thinking skills of analysis, synthesis, and evaluation. Fourth, it provides students with chances to design their presentations and form certain questions that enhance motivation and help to complete the required tasks. Generally, better planning of the jigsaw CL technique might lead to its appreciation by students and create a preferable learning setting. Moreover, the key advantage of jigsaw reading is that it can master more reading in a shorter amount of time and allows students to consider particularly about a main chunk of the script. In the classroom, the jigsaw reading is very straightforward and a stress-free technique to be used. By way of cooperative learning, the jigsaw reading motion can be useful at any ability level through reading comprehension instruction.

### **Concepts and Research related to Jigsaw Reading Cooperative Learning (JRCL)**

Kagan (1994) contended that jigsaw is an effective technique to use when you want to increase student's mastery or a topic at a hand, improve their concept progress, develop targeted discussion between students and raise the contribution of the group project and learning. By the same token, Suyanto (2012) states that students can be more accountable for the application of Jigsaw Technique in the teaching-learning process. Therefore, they take part in understanding a problem and answer it together in a group. It means that Jigsaw Technique may improve the students' reading comprehension significantly. Also, Amedu and Gudi (2017) noted that students in a cooperative class never felt bored, maintained in-class communication and learned the lessons well. According to Mengduo and Xiaoling (2010) the jigsaw classroom reduces learners' reluctance and anxiety to participate in the classroom activities while increasing self-esteem and self-confidence. It is an effective way to promote learner participation and enthusiasm as well as a useful technique for language learners to accomplish learning tasks in the classroom.

In this respect, Dwiniasih and Nugraha (2019) investigated the use of jigsaw as one of the collaborative learning strategies in learning that could foster students' reading comprehension. The results indicated that jigsaw implicates students' accomplishment better. Likewise, Tahrur, Simaibang, and Iskandar (2017) investigated the influence of Jigsaw Technique and traditional teaching method concerning learning interest towards reading comprehension achievement of business letters. Results exhibited that there was a significant effect of the use of both Jigsaw Technique and traditional teaching method towards reading comprehension achievement of business letters. Moreover, Amedu and Gudi (2017) aimed at investigating the attitude of students toward the cooperative learning approach. Outcomes revealed that students taught using the jigsaw cooperative method developed positive attitudes to the teaching strategy considerably. In the same vein, Marleni (2016) purposed to improve the students' reading comprehension of the first semester of English Study Program of reading comprehension by using jigsaw strategy. This study indicated that the jigsaw strategy can increase the students' reading comprehension. As a result, the students' reading comprehension can be developed over Jigsaw Strategy. As well, Nazari, Negari, Rajabi, and Khalaji (2016) investigated the effect of jigsaw task as a cooperative learning technique on reading skills improvement of Iranian EFL students. The results of the pretest and posttest in data analysis demonstrated the advantage of Jigsaw Technique in contrast to the traditional one. Also, it showed that the jigsaw task not only increases students' language skills but also generate an understanding learning environment. Also, Ghorbani Nejad and Keshavarzi (2015) investigated the effect of cooperative learning on reading comprehension and reading anxiety of pre-university students. The results revealed that there is a significant difference between the mean scores of the experimental and control groups and it indicated that control group was more anxious in reading than experimental group. Tran and Melbourne (2012) analyzed the effects of jigsaw learning on students' attitudes

in a Vietnamese higher education classroom. The results showed that generally students in the experimental group respected most working with others and receiving assistance, discussing and sharing information and teaching others, and they enjoyed the jigsaw environment.

## METHODOLOGY

### Participants

Nearly 205 EFL students constituted the population. They were studying English at Acer- English-café (Jahad Daneshgahi) in Zanjan Province (a province in the northwest of Iran). A reduced sample, comprising 100 intermediate students, was selected through convenience sampling which contained both age groups (adults and adolescents), as well as both genders (male and female). The adults' age range was 19-40, whereas the adolescents' was 13-18. In order to provide statistically accurate answers to the previously posed research questions, participants were randomly divided into two groups of intermediate learners: the control group (CG) and the experimental group (EG). Their proficiency level was ascertained through Oxford Quick Placement Test (OQPT). The control group comprised forty participants, (N=40), while the experimental group consisted of sixty students (N=60). The EG was administered by means of cooperative method of teaching reading comprehension, i.e. Jigsaw Technique.

### Instruments

Four instruments were utilized to collect pertinent data with respect to the determined research

variables. To see if we have homogeneous groups or not, first, an Oxford Quick Placement Test (2001) was distributed among all the participants of this study in order to determine their level of proficiency. The second instrument was Reading Comprehension test (both pretest and posttest). Two parallel tests were applied as the pretest and posttest for assessing reading comprehension. They comprised five reading passages with 18 multiple-choice items. The reading passages were randomly chosen from the sample tests that are frequently used to measure students' reading comprehension in Iranian educational settings. The researchers selected these passages because they were judged to be appropriate for intermediate level students. Cronbach's Alpha reliability coefficient were calculated to be 0.69 and 0.71 for pretest and posttest, respectively. The third instrument included EFL Reading Anxiety Inventory (EFLRAI). The researchers administered the Persian translation of EFL Reading Anxiety Inventory (EFLRAI) by Zoghi (2012) to the experimental group before and after the treatments and instructions. Zoghi (2012) investigated the internal consistency, test-retest reliability, and construct validity indices of EFLRAI and argued for its acceptable reliability and validity. Cronbach-alpha internal consistency estimate for EFLRAI, including 27 items was found to be 0.89. The last instrument was Attitude Questionnaire for exploring learners' feelings towards Jigsaw Technique. A survey questionnaire, consisting of 12 items, was used to assess the students' feelings about Jigsaw Technique in terms of cooperative language learning. The unidimensional questionnaire used in the study was developed by McLeish (2009) and had 12 items. This questionnaire has been designed to investigate the learners' attitude toward Cooperative Learning. For the purpose of analyzing the gathered data, the respondents were asked to rate each item on a Likert scale of options numerically coded as 1 (strongly disagree); 2 (disagree); 3 (neutral); 4 (agree); 5 (strongly agree). McLeish (2009) indicated acceptable indices for reliability and validity of the questionnaire. The Persian equivalent of this questionnaire developed by Farzaneh and Nejadansari (2014) was administered to the students in experimental group after the instructions to identify their overall attitude towards Jigsaw Technique. However, to enhance the validity of the questionnaire, the researchers administered some experts' judgments in the form of the Likert Scale.

### Procedure

The processes of instruction in the control group (CG)

The researchers started with 40 intermediate students from both adults, adolescents, males and females. Then, a text from Oxford Intermediate Reading Comprehension textbook was selected. Afterwards, the researchers distributed the reading text, so that each person had all the parts of reading. The instructor

asked the students to read the text individually and translate the text sentence by sentence. At the end of the instruction, the students responded to the reading comprehension questions individually.

The processes of instruction in the experimental group (EG)

At the first step, the researchers focused on 60 intermediate students and divided them into small cooperative jigsaw groups (i.e., 3-6 persons in each group). The instructor asked the students to make circles with their chairs. Then, a reading text from the same source was assigned for the experimental group. Afterwards, the pieces of reading texts were cut out into separate paragraphs and were distributed among the students so that each person had a different part of reading paragraph. The instructor asked each member of the cooperative jigsaw group to silently read the assigned text. The time allocated for this stage was 5-10 minutes.

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In the fourth and the last step, the instructor concluded with several key questions for students to discuss implications of the points with people either within the groups or with the entire class. A number of oral questions based on the reading text were asked to ensure that individuals had grasped the overall content. During this step, each person had all of the pieces of the whole text in his/her hand.

## RESULTS

### Results for the Second Research Question

The first research question aimed at identifying the possible effect of Jigsaw Technique as the treatment in the study on the students' reading comprehension. In this line, the test of reading comprehension was administered to the control and experimental group to ensure the homogeneity of students' level of reading comprehension prior to the intervention in the EG. A test of normality was run to investigate the normality of the distribution of data. The results of Kolmogorov-Smirnov and Shapiro-Wilk statistics indicated that the data distribution was normal. This led us to choose a parametric statistical technique. Independent samples t-test was then conducted to find whether there is a significant difference in the mean scores in terms of students' reading comprehension level. Table 1 displays the descriptive statistics for the pretest findings of reading comprehension.

Table 1

*Descriptive Statistics for the Reading Comprehension Pretest*

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest on Reading comprehension	Control group	40	1.7392	.27500	13.525
	Experimental Group	60	1.7783	.22958	13.583

Table 2 demonstrates the results of independent samples t-test for the pretest on reading comprehension.

Table 2

*Independent-samples T-test Results for the Reading Comprehension Pretest*

	Levine's Test for Equality of Variances F	Levine's Test for Equality of Variances Sig.	Levine's Test for Equality of V t
Pre-test	.191	.663	-.162

As represented above, there is no statistically significant difference between CG and EG in their reading comprehension ability [ $t(98) = -.162, p = .872$ ]. This finding indicates that the students in both groups were homogenous regarding their performance on the reading comprehension test before treatment was applied to the EG.

Afterwards, the study aimed to compare the reading comprehension scores in the post-test for CG and EG after treatment application. However, preliminary analysis was conducted to ensure no violation of the assumption of normality. The results of Kolmogorov-Smirnov and Shapiro-Wilk statistics indicating that the data distribution is normal. Accordingly, an independent samples t-test was conducted to compare the reading comprehension scores in the post-test for CG and EG after application of treatment. Table 3 displays the statistics for the posttest results.

Table 3

*Descriptive Statistics for the Reading Comprehension Posttest*

	Group	N	Mean	Std. Deviation	Std. Error Mean
Posttest on Reading comprehension	Control group	40	14.1000	1.41058	.22303
	Experimental Group	60	15.7667	1.58774	.20498

As shown above, the mean score for the students in the EG ( $M=15.76, SD=1.58$ ) is greater than the mean of the CG ( $M=14.1, SD=1.41$ ). Table 4 demonstrates the findings of independent samples t-test, including the significance level of mean difference between the groups.

Table 4

*Independent-samples T-test Results for the Reading Comprehension Posttest*

	Levene's Test for Equality of Variances F	Levene's Test for Equality of Variances Sig.	Levene's Test for Equality of t
Post-test	2.525	.115	-5.37

As the above table indicates, there is a significant difference in scores for CG and EG [ $t(98) = -5.37, p = .000$ ]. The effect size was calculated to be large ( $\eta^2 = 0.227$ ).

### Results for the Second Research Question

This research question was intended to explore the possible effect of age on students' reading comprehension



ability as the moderator variable in the study. The students in the EG were divided into two groups of adults and adolescents according to their age range. Preliminary analysis of normality indicated a normal distribution of data. Then, an independent samples t-test was used to compare the students' scores on the reading comprehension post-test in these two groups. Table 5 are provided descriptive statistics for adults and adolescents' scores on the post-tests.

Table 5

*Descriptive Statistics for Adults and Adolescents' Scores in the Experimental Group*

	Age	N	Mean	Std. Deviation	Std. Error Mean
Post-test	Adult	29	16.0000	1.43925	.26726
	Adolescent	31	15.5484	1.70956	.30705

As represented in the above table, the mean scores for the adults exceed those of the adolescents. However, as seen in Table 6, the results of t-tests reveal that the difference in the mean scores is not significant.

Table 6

*Independent Samples Test for Adults and Adolescents' Scores in the Experimental Group*

	Levene's Test for Equality of Variances F	Levene's Test for Equality of Variances Sig.	t-test for Equality of Means t
Post-test	2.649	.109	1.103

As concerned with the posttest findings, the difference between the students' scores was non-significant for adults (M= 16, SD=1.43) and adolescents [(M= 15.54, SD= 1.70), t (58) = 1.10, p=.275].

### Results for the Third Research Question

The third research question addressed the possible contribution of Jigsaw Technique to the reduction of students' reading anxiety. The results of Kolmogorov-Smirnov and Shapiro-Wilk statistics indicates that the assumption of normality is met for the obtained data. As a result, since the scores of the students in the EG on their reading anxiety were compared on two different occasions (i.e., before and after the implementation of Jigsaw Technique as the treatment), paired-samples t-test was adopted as an appropriate analytical technique to compare the mean scores. A paired-samples t-test was conducted to evaluate the impact of the intervention (i.e., Jigsaw Technique) on the students' scores of EFL reading anxiety.

Table 7

*Descriptive Statistics for Reading Anxiety of time 1 and time 2*

	Mean	N	Std. Deviation	Std. Error Mean
Reading Anxiety Time 1	62.1667	60	13.43177	1.73403
Reading Anxiety Time 2	44.9333	60	11.01750	1.42235

Table 7 shows the statistics for the paired samples in the t-test. Time 1 refers to the group of scores obtained before the implementation of the treatment in the class. However, time 2 includes the scores collected when the test was administered after the treatment has been introduced to the class. Table 8 reveals the results of paired samples t-test for the test of reading anxiety prior to and after the treatment.

Table 8

*Results for Paired-sample T-test for the Experimental Group's Reading Anxiety Before and After Treatment*

		Paired Differences	Paired Differences	Paired Differences	Paired Differences
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower
Pair 1	RATIME1* RATIME2**	17.23	12.34	1.59	14.04

\*Reading anxiety time 1

\*\*Reading anxiety time 2

As indicated in the table, there is a statistically significant decrease in reading anxiety scores from Time 1 (M= 62.16, SD=13.43) to Time 2 [(M= 44.93, SD= 11.01),  $t(59) = 10.81, p < .05$ ]. The eta squared statistic (0.65) indicated a large effect size.

### Results of the Fourth Research Question

This research question is concerned with the overall attitude of the learners towards Jigsaw Technique. Table 9 shows how Jigsaw Technique is perceived by the students after the treatment was introduced in the class.

Table 9

*Statistics on Students' Attitudes towards Jigsaw Technique after Treatment*

Item	Attitudes towards jigsaw technique	SD	SD	D	D	N	N
		F	%	F	%	F	%
1	I willingly participate in cooperative learning activities.	1	1.7%	2	3.3%	14	23.3%
2	When I work with other students I achieve more than when I work alone.	7	11.7%	8	13.3%	14	23.3%
3	Cooperative learning can improve my attitude towards work.	4	6.7%	7	11.7%	12	20%
4	Cooperative learning helps me to socialize more.	6	10%	0	0%	7	11.7%
5	Cooperative learning enhances good working relationships among students.	3	5%	3	5%	5	8.3%
6	Cooperative learning enhances class participation.	3	5%	3	5%	10	16.7%
7	Creativity is facilitated in the group setting.	4	6.7%	4	6.7%	25	41.7%
8	Group activities make the learning experience easier.	6	10%	6	10%	11	18.3%
9	I learn to work with students who are different from me.	9	15%	5	8.3%	14	23.3%
10	I enjoy the material more when I work with other students.	7	11.7%	9	15%	10	16.7%
11	My work is better organized when I am in a group.	9	15%	5	8.3%	13	21.7%
12	I prefer that my teachers use more group activities / assignments.	2	3.3%	7	11.7%	10	16.7%

SD: Strongly Disagree

D: Disagree

N: Neutral

A: Agree

SA: Strongly Agree

As shown in the table, the frequencies of the responses for the questionnaire items show a positive attitude towards cooperative learning using Jigsaw Technique. Nonetheless, both positive and negative evaluations

were witnessed in the students' responses. As a case in point, item 4 showed that almost 79 percent of the students believed that cooperative learning could help them to socialize during the implementation of Jigsaw Technique. As illustrated in the table, the feelings are strongest in two areas, helping the students to socialize and enhancing good working relationships, where a 51.7 and 40 percent strong agreements can be observed. Also, high percent of agreements can be found in items 1, 3, 6, 8, and 12. It is noticed that students positively rated willingness to participate in cooperative learning activities, improving students' attitude towards work, enhancing class participation, facilitating learning experience, and preferring more group activities. The same traces can be seen in achieving more when working with peers, having a better organization, and the like. The lowest assessments, however, were in Item 10 where 10 and 21.7 percent of the students had strongly agreed and agreed respectively to enjoy the materials more when working with other students. Besides, items 7 and 9 display an uneven distribution across the answers meaning that the respondents did not agree upon their answers. These items show that not all the students agreed in improving the creativity and learning to work with different people using Jigsaw Technique. The overall trend displayed a positive evaluation and strong feelings towards the use of cooperative learning in the classroom as we witnessed skewed prominence of positive assessments. Optimistic evaluations abound in the questionnaire and can confirm the students' appreciation of the program. We can conclude that the students, in all the stages, attributed positive feelings with this approach and, therefore, Jigsaw Technique can play a significant role in improving students' attitudes towards cooperative learning.

## Discussion

The first research question of the present study was to find out the improvement of the intermediate EFL learners' reading comprehension through Jigsaw Technique, practically. Statistical analysis of the results in the EG revealed that the mean score of the students was greater than the mean score of the CG. It means that the students had benefited from Jigsaw Technique in the EG and it can be said that the treatment of the Jigsaw Technique, in contrast to placebo which was applied to the CG, was more helpful and beneficial to the students. Also, the findings are in agreement with some of the findings of the previous studies. Kazemi (2012) studied the influence of the jigsaw teaching technique on the achievement of Iranian EFL learners. She found that the learners' post-test reading scores were enhanced in contrast to their pre-test scores. Similarly, the results of the current study can be supported by Marleni (2016) who studied the learners' reading comprehension of the first semester of English study program of reading comprehension by using jigsaw strategy. The results indicated the improvement of students' reading comprehension over jigsaw strategy. Likewise, Nazari et al. (2016) investigated the effect of jigsaw task as a cooperative learning technique on reading skills improvement of Iranian EFL learners. They found that the results of the pre-test and post-test demonstrated the usefulness of Jigsaw Technique in contrast to the traditional one. The findings are also supported by Ghorbani Nejad and Keshavarzi (2015), Keshta (2016) and Sabbah (2016). Ghorbani Nejad and Keshavarzi (2015) investigated the effect of cooperative learning on reading comprehension and reading anxiety of pre-university students. The results revealed that there is a significant difference between the mean scores of the experimental and control groups and it indicated that control group was more anxious in reading than experimental group. Similarly, Sabbah (2016) investigated the effect of using a jigsaw cooperative strategy on ELS learners' achievement in reading comprehension. She found that there were significant dissimilarities for the EG. Also, the results are in line with findings by Tahrūn, Simaibang, and Iskandar (2017), who investigated the influence of Jigsaw Technique and traditional teaching method concerning learning interest towards reading comprehension achievement of business letters. They found that there was a significant effect of the use of Jigsaw Technique. Likewise, Dwiniasih and Nugraha (2019) investigated the use of jigsaw learning strategies in learning that could foster learners' reading comprehension. They found that jigsaw implicates learners' accomplishment better.

The second research question of the current study was to discover any difference between adults and adolescents regarding the effect of Jigsaw Technique on their reading comprehension performance. Statistical analysis of the results showed no significant difference in this respect. To the best of the researchers' knowledge, no similar study finding was spotted in the related literature. Thus, these findings seem to be a pioneering research outcome which requires further studies to be solidly established.

The third research question deals with whether Jigsaw Technique contribute to the reduction of reading anxiety or not. Statistical analysis indicated that students' reading anxiety scores were high in time one (before treatment) as compared to time two (after treatment). In other words, students' reading anxiety level was considerably different before and after the implementation of Jigsaw Technique. It can be concluded that Jigsaw Technique was an advantage to the students' feeling and emotion. This can be supported by Mohammadpur and Ghafournia (2015). They elaborated the effect of foreign language anxiety on reading comprehension achievement of Iranian EFL learners. They found significant difference among the participants.

The last and fourth research question concerned with the overall attitude of the learners towards Jigsaw Technique. Statistical analysis revealed positive attitude towards jigsaw cooperative learning. Based on the findings of the students' jigsaw attitude, most of the students willingly take part in cooperative learning activities. Also, their view was that whenever work with other students they achieve more. As most of the students mentioned in the questionnaire, their attitude can become positive through cooperative learning. Likewise, data analysis showed that students socialize more by cooperative learning. Based on data analysis, students were able to foster good relationships among students. Similarly, they believe that jigsaw learning foster class participation. On the other hand, students do not consider that creativity is facilitated in the group work. Commonly, most of them had neutral view on this case. A majority of students' attitude was that group activities make the learning easier. Students' point view was that they have a chance to work with different students and have different personality types. Also, high students' agreement was that they enjoy the material more when they work with other students. Likewise, most of the students' attitude was their work organized when they are in a group. A great deal of them strongly agree with using more group activities and assignments. The results of the fourth research question of the present study can be supported by Farzaneh and Nejadansari (2014). Investigating learners' attitude towards using cooperative language learning for reading the instruction in the Iranian context, they found that the participants commonly tend to support the application of cooperative strategies in teaching and learning reading comprehension.

## CONCLUSION

The first research question enquired whether Jigsaw Technique had any influence on students' development of their reading comprehension ability. The results indicated noticeable effect on students' reading comprehension achievement in the post test. There was significant difference in mean scores of the experimental group vs. the control group in this regard: ( $M=15.76$ ) and ( $M=14.1$ ), respectively. Thus, it was concluded that the instruction through Jigsaw Technique actually contributed to students' significant accomplishments in reading activities. Therefore, the experimental group who received Jigsaw Technique outperformed the control group.

The second research question questioned any possible difference in the reading performance of adults vs. adolescents who were treated with Jigsaw Reading Technique. The posttest results revealed that the difference across adults ( $M= 16$ ) and adolescents ( $M= 15.54$ ) was non-significant. Consequently, there was no considerable difference across adults' and adolescents' benefits from this technique.

The third research question dealt with the possible influence of Jigsaw Technique on reducing learners' reading anxiety. To this end, EFL Reading Anxiety Inventory (EFLRAI) was administered before and after the treatment for the experimental group. This Inventory was utilized to determine whether there is any reduction of students' reading anxiety before and after the treatment. The results were indicative of a statistically significant reduction in reading anxiety scores ( $M1= 62.16$ ), ( $M2= 44.93$ ). Hence, reading anxiety was diminished after implementation of Jigsaw Technique.

The fourth and the last research question targeted the overall attitude of the learners towards Jigsaw Technique after the treatment. A descriptive table and information on item frequency was applied to assemble the relevant data. Learners' attitudes mostly revealed to be positive, indicating learners' willingness toward using cooperative learning in the classroom. Thus, one can infer that learners liked this technique, and believed it to be really effective in helping them to cope with learning challenges.

## Pedagogical Implications

Commonly, teachers and students consider reading comprehension and reading anxiety as the most challenging issues in the classrooms and students are less self-confident and more anxious in such skills. Therefore, a number of implications for EFL teachers and students are presented below.

### Implications for English Language Teachers

Based on the outcomes of this study, some suggestions are mentioned here to help teachers recognize the problematic issues among their students in the classroom. Teachers can consider these recommendations in order to overcome barriers and try to create dynamic and attentive classes. Firstly, since learners' interaction and participation is a crucial aspect in cooperative learning, teacher's duty is to motivate and encourage students to do group work. In this vein, students become capable of sharing information with other partners and get a chance to work with other personalities and identities inside the group. Secondly, teachers should raise students' self-confidence through making them responsible for the given tasks and accomplishments. Thirdly, as the instructor, teachers should be capable of increasing the students' understanding of the whole theme, and reducing their anxiety and creating a stress-free environment while working on a task. This helps the students feel confident and relaxed and to achieve success in their tasks. Fourth and last, since teachers' main responsibility is to execute specific and purposeful tasks and materials for their students, the instructors can benefit from cooperative models and perceive the practicality of this technique for reaching pedagogical objectives.

### Implications for EFL learners

Similarly, some implications for learners are mentioned here based on the results of this study. Firstly, students can benefit from various kinds of cooperative techniques and develop their social capabilities, and recognize the importance and advantages of group work. Thirdly, through this technique student may share ideas and work with different individuals in their respective groups. Fourthly, such team works make students responsible for the tasks both in the group and outside. Fifth and last, students become capable of controlling their anxiety and act more confidently during the tasks.

## Suggestions for Further Research

Some recommendations are mentioned for further research based on the findings of this research in the following:

The present study's was not gender-based and it was the mixture of both. Next studies can focus and conduct distinct genders either females or males with intermediate proficiency.

This study only holds on intermediate proficiency. Future studies can be conducted with

other language proficiency, such as advance, upper-intermediate or elementary accompanied with other types of cooperative learning techniques such as Inside-Outside Circle, Learning Together, Complex Instruction, Group Investigation, Constructive Controversy, Teams-Games-Tournaments, and etc.

Future studies would administer Jigsaw Technique with other language skills, such as, jigsaw listening, jigsaw writing in terms of different or same age and proficiency.

Future researchers would analyze and conduct jigsaw reading with other language components such as grammar, vocabulary, pronunciation and etc.

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