The Effect of Jigsaw Cooperative Learning Technique on High school Students’ Reading Comprehension

Parviz Behrouzi, PhD

Faculty Member at Islamic Azad University, Garmsar Branch, Iran

Fatemeh Assiri

Islamic Azad University, Garmsar Branch, Iran

Abstract

The present study aimed at investigating the effect of Jigsaw Cooperative Learning technique on students’ reading comprehension ability of English as a Foreign Language (EFL). After administering the language proficiency PET test (version), homogeneous intermediate female high school students were selected, and they were randomly assigned to control and experimental groups with learners in each. The control group was taught using a traditionally popular method while the experimental group was taught using a Jigsaw Cooperative Learning Technique. A True experimental design was employed for the study. The results indicated that a statistically significant difference existed between the two groups in regards to the dependent variable which was reading proficiency. Though quite restricted, the present study pointed to the advantages of using Jigsaw Cooperative Learning Technique in the development of reading comprehension.

Key Terms: Cooperative Learning, Jigsaw, Reading comprehension

Introduction

Reading is a vital cultural tool in all modern societies. The ability to read and understand a wide variety of texts is crucial to gaining success in educational, professional, and routine activities. Achieving proficiency in reading English texts should be considered a major objective at high schools. Such a view holds true both “…within and beyond the context of formal education” (Boulware-Gooden et al. p. ).

The acquisition of reading skill, however, is never easy and students need consistent practice to become fluent readers. Successful readers have to solve many puzzles, such as learning to recognize unfamiliar letters, words, syntax, and discourse patterns. These challenges can be overcome more easily if students are taught reading strategies, and
helped to find reading classes more interesting and highly motivated to enhance their reading ability. To respond to such requirements, teachers need to reconsider their reading pedagogy and move beyond traditional approaches that primarily focus on vocabulary, grammar, and text analysis.

In recent years, Iran has experienced an important paradigm shift in education. A teacher-centered approach, which largely ignores individual differences and the contribution of the learners in the learning process, has been replaced by a learner-centered approach. Therefore, it is necessary to make use of various methods and techniques which will minimize the differences within a classroom and help learners to participate in class activities equally. Cooperative learning is one of the methods which provide opportunities for learners to engage in meaningful communication. However, cooperative learning is more than just putting students in groups and giving them something to do. It can lead to a more dynamic classroom interaction that promotes more learning, when carefully planned and the teachers learn how cooperative learning is operationalized in different educational settings.

The present study has tried to examine the effect of cooperative learning approach of Jigsaw on the enhancement of reading comprehension ability.

Although hundreds of studies have been conducted on the cooperative learning in many different areas, Jigsaw cooperative technique is a relatively new and unknown area of inquiry in Iran. The full power of Jigsaw cooperative learning in foreign language classrooms needs to be further exploited. This situation calls for a thorough investigation into the characteristics and benefits of Jigsaw cooperative technique in foreign language classrooms.

**Cooperative learning**

Language teaching seems to be a dynamic concept which is always going through stages of modification. It is like a turning snowball experiencing different theories, scholars, pioneers, while absorbing some, and leaving some others behind. That is why different teaching methods are constantly being adjusted.

Cooperative learning is one of the most remarkable and fruitful areas of theory, research, and practice in language education. It may be characterized as a learning approach in which students form small mixed groups in classrooms and other environments to assist each other in learning a certain academic subject according to a common objective in which the individuals’ self-confidence are triggered and their communication and interaction are developed. Through such tasks and activities, problem-solving and thinking capacity are enhanced and students participate in the
learning process actively and have an opportunity to learn from each other (Bowen, Carol, Coppola & Lawton, Eilks, Gardener & Korth, Gillies, Hall & Paolucci, Hennessy & Evans, Levine, Lin, Prichard, Bizo & Stratford, Prince, Slavin, Şimşek).

Different views have been presented on the nature and role of cooperative learning has been defined by different scholars. Brown believed that CL is: “counseling – learning model of education, in which students and teachers join together to facilitate learning and lower the anxiety.” (p. 102)

Students who work together also appear to have a higher regard for school and for the subjects they are studying and feel more confident and self-assured. As a result, both motivation and achievement improve (Hancock).

Cooperative learning, the student-centered approach to teaching that is grounded in the belief that an individual’s potential to succeed is enhanced by working in groups (McCafferty, Jacobs, & Dasilva).

Mabrouk defines cooperative learning as an approach to group work that minimizes the occurrence of those unpleasant situations and maximizes the learning and satisfaction that result from working together with a high-performance team.

Finally, it is suggested by (Ghaith; Zuheer) that cooperative learning is an effective strategy to be used in classrooms with different language learners. Furthermore, pair and small group activities can provide learners with more time to speak the target language than teacher-fronted activities, and promote learner autonomy and self-directed learning.

As Johnson, Johnson and Stanne state out of the many methods that different teachers or researchers have developed, as, the following ten had received the most attention, as shown in Table 1.

Table 1: Modern Methods of Cooperative Learning

<table>
<thead>
<tr>
<th>Researcher-Developer</th>
<th>Date</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johnson &amp; Johnson</td>
<td>Early</td>
<td>Learning Together (LT)</td>
</tr>
<tr>
<td>DeVries &amp; Edwards</td>
<td>Mid</td>
<td>Teams-Games-Tournaments (TGT)</td>
</tr>
<tr>
<td>Sharan &amp; Sharan</td>
<td>Mid</td>
<td>Group Investigation (GI)</td>
</tr>
</tbody>
</table>
Jigsaw techniques

The jigsaw technique is a simple, well-designed cooperative learning scheme that emphasizes not only individual accountability, but also achievement of group goals, both of which are critical for improved student learning in cooperative settings. This technique was developed by Eliot Aronson (1978) for the first time and later supported by (Aronson & Patnoe 1994; Hedeen, 1992).

In a jigsaw technique, the class is divided into several teams, with each team performing separate but related assignments. When all team members have successfully completed the task, prepared, the class is re-divided into mixed groups, with one member from each team in each group. Each person in the group teaches the rest of the group what he/she has learned as a member of the first group. As a final step, all members of each group tackle the assignment together and try to assemble the pieces in such a way that the full picture is revealed, hence the name jigsaw. Each person in the group teaches the rest of the group what he/she has learned as a member of the first group. As a final step, all members of each group tackle the assignment together and try to assemble the pieces in such a way that the full picture is revealed, hence the name jigsaw. Each person in the group teaches the rest of the group what he/she has learned as a member of the first group. As a final step, all members of each group tackle the assignment together and try to assemble the pieces in such a way that the full picture is revealed, hence the name jigsaw.

Designing an effective jigsaw activity requires different, but overlapping, team assignments and a meaningful group task. Furthermore, attention must be paid to how effectively the learners are prepared to pass on the intended information to their peers and how the instructor is supposed to evaluate the degree of learner success.
Doymuş(9002) Hedeen(9002) believe that it is seen that the jigsaw techniques, which have quite flexible practices with limitless variations, are among the techniques, which have been mostly studied and more frequently used compared with the other cooperative learning techniques until today.

Today, there are currently six types of Jigsaw strategies available for teachers to use in their classroom: (a) Jigsaw developed by Aronson (1221); (b) Jigsaw II developed by Slavin (1212); and (c) Jigsaw III developed by Stahl (1226). Jigsaw and Jigsaw II differ only in the fact that team competition is allowed in Jigsaw II. In addition to (d) Jigsaw IV was developed by Holliday (9000). It is distinguishable from Jigsaw I-II-III because students have quizzes for checking correct learning in expert and actual groups and the practice includes re-teaching missing parts in the subject at the last step. In addition to them, Hedeen (9002) developed (e) Reverse Jigsaw technique and (f) Doymuş (9002) developed Subject Jigsaw technique.

Perkins & Saris (9001) state that the attitudes of the learners using Jigsaw model I were very positive, especially as an alternative learning experience. Instructors who are reluctant to compensate for the time spent on inactive techniques (such as lecturing) with time on active techniques (such as jigsaw tasks) will note that a Jigsaw exercise saves time as compared to doing worksheets individually. It is also noted that the performance of learners using the Jigsaw technique was better or, at least, equal to that of the ones without such activities.

The Jigsaw activity is a cooperative learning Strategy in which students become responsible for reading, understanding and conveying their sections of material to other students. Features of jigsaw technique make suitable for enhancing two essential and related teaching goals that contribute to reading comprehension: developing students’ metacognitive awareness, and learning the content while teaching it to peers in the small group (Jing Meng,9011).

**Method**

**Participants**

To carry out the present study, 14 female subjects were randomly selected out of 110 students. All the subjects were high school students in the city of Garmsar. The age of the participants ranged from 1 to 18. In order to make sure that the participants were at the same proficiency level, a PET test, (9002 version) was administered. The students were then randomly assigned to two groups of 29 each; one being the control group and the other one experimental.
**Design**

The design used was the experimental research model consisting of a pre-test, a post-test, and a control group. The experimental group was taught through Jigsaw cooperative learning technique, whereas the control group was taught through the traditional teaching method. The schematic representation for the research design can be illustrated as follows:

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pre-test</th>
<th>Treatment</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>T_</td>
<td></td>
<td>T_</td>
</tr>
<tr>
<td>Experimental</td>
<td>T_</td>
<td>X</td>
<td>T_</td>
</tr>
</tbody>
</table>

**Materials**

**Passages selected for the experiment**

The texts chosen to perform the research included the six reading passages which came the students’ text book (3rd grade) and four from the interchange (Jack C.Richards). In order measure the readability index of all the texts used in this study the “Fog Index Formula” (Alderson and Urquhart, 1984) was applied.

The average readability of the participants’ textbook passages turned out to be 16.22 and the standard deviation was 2.28, so texts’ difficulty in this experiment was considered to be \(14.62 \leq \text{text difficulty} \leq 17.82\). The readability values of texts taken from interchange are 14.82, 15.54, 16.43 and 17.49.

**Instruments**

In order to procure optimum reliability and validity for the results of this research, the following instruments for gathering data were employed and implemented.

**PET test**

This test was administered to all the initial participants as a standard measure to determine their level of proficiency in the two groups in order to make sure the groups were homogenous. The reliability of this test was downloaded from the internet which was in the Middle East countries.

**Pre-test and post test**

A reading comprehension test was given to the subjects of the experimental group and the control group as a pre-test and post-test. This was taken from TOEFL (Philips,
and consisted of 22 items which was used to assess and compare the participants’ reading ability before and after the treatment. In order to determine the reliability of the reading section of TOEFL, the test was piloted among a parallel group of subjects. The reliability of this test was calculated via KR-21 formula and was found 0.11. In order to measure the readability indices of TOEFL passages the “Fog Index Formula” (Alderson and Urquhart, 1984) was applied.

Procedure

In order to carry out the research and come up with statistically acceptable outcome results, the following procedures were used.

First, the language proficiency test called “PET” (9002 version) was administered to 100 students of Garmsar high schools so that homogenous members could be selected. Upon performing the analysis, 46 participants whose scores fell one standard deviation above or below the mean were selected as participants. Finally, they were divided into two groups randomly, 29 subjects as the experimental group and the other 29 as the control group.

After forming the groups, a reading comprehension test derived from TOEFL (Philips, 1984) was administered. The reliability of the test was estimated through the KR-21 formula and was found to be an acceptable index; the test was used as a pretest for the two groups. One week after giving the pretest, the treatment was applied for twelve consecutive sessions, two sessions a week, and each session consisting of 20 minutes. So, one week after finishing the treatment, the same pretest was used as the posttest. The more details of this study, in particular, the treatment are presented in the following.

1) The subject formed heterogeneous teams of four members each (home teams). Each member of the team received a passage which had been divided into four sections. Then expert sheets were developed to help students comprehend each section.

2) Students left their teams and formed expert teams of no more than four members. Each expert team was assigned a subtopic of the original passage.

3) The subjects met in their expert teams to first comprehend the reading material specially assigned to the expert team and then to plan and rehearse how to convey it to the members of their home team.

4) Expert members returned to their home teams to inform their teammates.

5) The subjects answered the reading comprehension questions in their home groups.
The learners took the quizzes which covered all the subtopics individually. The quizzes were aimed at subject evaluation and creating encouragement toward individual accountability.

Upon completion of quiz administration, the members of the high–scoring teams were classified as Super, Great, and Good according to the following guidelines suggested by Slavin (1995). Members of the teams who achieved an average of below 1 improvement points were not given any team certificates. This was done in order to encourage the participants to do their best to earn points for their teams and improve their average from 1 to 1 2. They are awarded a Good Team Certificate, 1 3–2 0 improvement of 2 0–2 9 points gets the Super Team Certificate.

**Teacher role:** 1) the teacher in the experimental group selected reading passages. 2) each of the reading passages was divided into 4 smaller passages by the teacher. 3) she wrote the title of the reading passage on the board then she asked some questions about the reading to motivate the learners to read the passage, (use some pre-reading strategies) 4) she also developed the expert sheets to help students comprehend each section (main idea chart and story sequence chart). 5) teacher helped the learners students whenever they required it.

A great deal of listening and speaking activities are performed by all participants whether informers or the informed. However, such procedure can create a considerable amount of noise and cause confusion at the beginning of stages. Consequently, the teacher uses the management technique of a Zero-Noise Signal to maintain an acceptable noise level. Learners try to respect each other as a group member. Often, this requires teachers to demonstrate their intention through role-play Judy Willis (1990)

**Results**

To test the null hypothesis several statistic a procedures were utilized.

**Result of PET test**

In order to make sure that the control and experimental groups did not differ significantly a PET test was administered.

| Table 1: Descriptive statistics of the homogeneous group |
|---|---|---|---|---|---|---|
|   | N | Mean | Std. Deviation | Variance | Range | Min | Max |
| Group 1 | 22 | 27.8 | 6.4 | 44.3 | 17 | 21 | 37 |
| Group 2 | 22 | 25.0 | 4.8 | 22.8 | 19 | 17 | 35 |
**Reading comprehension pretest**

In order to measure the reading comprehension ability of the participants, the reading section of TOEFL (Philips, 1997) was administered. The descriptive statistics for this pretest is shown in the following table.

**Table 3: Descriptive Statistics of Reading Comprehension Pretest**

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>32</td>
<td>12.2221</td>
<td>2.9091</td>
<td>.14402</td>
</tr>
<tr>
<td>Experimental</td>
<td>32</td>
<td>12.1910</td>
<td>2.2212</td>
<td>.40029</td>
</tr>
</tbody>
</table>

As the above table displays, the mean of the experimental group is 12.1910 while the mean of the control group is 12.2221. The mean values which differ slightly, indicate that the participants in both groups possessed approximately of the same degree of proficiency in reading comprehension.

A t-test was employed to verify the level of significance for the two means and the outcome is displayed in table 2.

**Table 2: Independent Samples Test on Reading Comprehension Pre-test**

<table>
<thead>
<tr>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Sig.</td>
<td>F</td>
</tr>
<tr>
<td>.005</td>
<td>.942</td>
<td>-.985</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td></td>
<td>Equal variances not assumed</td>
</tr>
</tbody>
</table>

As table 2 shows since the observed significance is greater than .01, the equality of variances is confirmed. Also, since the lower limit is negative and the upper limit is positive, the mean difference between two groups is not meaningful. This could prove there is no statistically significant difference between the mean scores of the two groups before carrying out the treatment.
**Reading comprehension posttest**

After 19 sessions of treatment, the same reading comprehension test was administered as the posttest. The descriptive statistics of the post test is presented in the following table.

**Table 4: Descriptive Statistics of Reading Comprehension Posttest**

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std.Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>control</td>
<td>32</td>
<td>99.0491</td>
<td>2.21101</td>
<td>.42941</td>
</tr>
<tr>
<td>Experimental</td>
<td>32</td>
<td>91.1910</td>
<td>2.26119</td>
<td>.44911</td>
</tr>
</tbody>
</table>

As it is clearly shown, the mean score of the posttest of the experimental group is calculated to be 91.1910 and the standard deviation is 2.26119. The mean score of the control group is 99.0491 and its standard deviation is 2.21101 comparing to pretest, the difference between the scores of the participants in control and experimental groups has increased.

**Table 5: Independent Samples Test on Reading Comprehension Post-test.**

<table>
<thead>
<tr>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>3.195</td>
<td>61.879</td>
</tr>
</tbody>
</table>

In the above table, the observed significance is greater than \( \alpha = .01 \), it shows that variances are equal. It is also shown in this table that both the upper and the lower limits
are positive, so the mean difference between the two groups is meaningful. Therefore, it can be concluded that the participants in experimental group have surpassed the control group. Accordingly, the null hypothesis is rejected.

**Conclusion**

Considering the results of the present study, it is obvious that the Jigsaw technique which is derived from cooperative learning approach is more effective in improving reading comprehension skills of learners who study English as a foreign language as compared to the traditional teaching methods.

The reason for the fact that the mean of the scores of the participants in the jigsaw group is higher as compared to that of the control group may be attributed to the fact that cooperative (jigsaw) group participants fulfilled their individual responsibilities during the study. They performed their task of transferring information to their peers quite successfully. They had meaningful and effective interactions with other group members and actively participated in the process. These findings share many common features with other studies in the relevant literature (Graham, 1990; Ghaith, 1994; Millis, 1990; Stevens, 1997; Howard, 1994).

More research should also focus on comparisons between different techniques (models) of cooperative learning, as well as comparisons with traditional teaching methods in order to determine if other cooperative learning models are equally effective in producing the desired learning outcomes. This study could also be replicated with learners possessing variety of proficiencies.
Reference


Millis, B.J. (1901). *Cooperative learning in higher education*. Styius publishing. LLC.


Willis, J. (1997) *Cooperative learning Is a brain turn-On.* Middle School Journal