The Effect of Student Team-Achievement Division (STAD) on Language Achievement of Iranian EFL Students across Gender

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Abstract

The present investigation is a quasi-experimental research which has used the two group pre-test post-test design. A total of 80 female and male (48 females and 32 males) EFL students at the intermediate level of English proficiency studying in Jahad Daneshgahi Language Institute in Urmia, Iran, were chosen and assigned to two groups based on the placement test results. The sample was divided into two groups of experimental group (n=40) and control group (n=40).

The results of the study showed that there was a statistical significant difference at the level of 0.05 between the means of the performance of the experimental and control groups on the achievement test for the benefit of the experimental group. Hence, STAD can effectively be implemented to improve the learners' language proficiency. The results indicated that there were no gender differences in students' language achievement after their being taught through STAD. Hence, ultimate result of the study indicated that STAD (Student Team Achievement Division) was more effective instructional paradigm for English as compared to the traditional method of teaching. Due to its provision for higher learning engagement, it proved to be an active learning strategy.

Keywords: Cooperative learning, Student Team Achievement Division (STAD), language achievement.

Introduction

Mankind adapt to the community life since the beginning of creation. They are social and civilian in their tendencies. They rarely live or work alone, but they always tend to interact in a safety social medium which supplies them the necessary support to continue their life. So, cooperation is the basic characteristic of human beings both in life and education.

Nowadays, in all countries, education undoubtedly plays an important role. The young generation needs to be well educated to prepare them for the era of globalization. Learning a foreign language has become a great concern for human beings everywhere across the world. (Mohseni & Jamour, 2012). One of the important goals of education is to improve both academic achievement and knowledge retention. Reaching the educational goals is dependent upon being able to choose the appropriate method (Pandy & Kishore, 2007). For an effective learning, teachers should be attentive about teaching style, and in order for teachers can be attentive about the method, they should be familiar with the methods available and appropriately use them (Demirel, 1999).

Teachers have the option of structuring lessons competitively, individualistically, or cooperatively. In a competitively structured classroom, students engage in a win-lose struggle in an effort to determine who is best (Johnson & Johnson, 1991). In competitive classrooms students perceive that they can obtain their goals only if the other students in the class fail to obtain their own goals (Johnson, Johnson, & Holubec, 1986). Students in independently structured classrooms work

by themselves to accomplish goals unrelated to those of the other students (Johnson & Johnson, 1991). In a cooperative learning classroom students work together to attain group goals that cannot be obtained by working alone or competitively. In this classroom structure, students discuss subject matter, help each other learn, and provide encouragement for members of the group (Johnson, Johnson, & Holubec, 1986). It is generally asserted that CL is a highly appropriate option for all students because it emphasizes active interaction among individuals of diverse abilities and backgrounds (Tsai, 1998; Wei, 1997; Yu, 1995) and demonstrates more positive student outcomes in academic achievement, social behavior, and affective development. Several researchers have reviewed studies and literature that support the positive impact cooperative learning has on student achievement (Gabriele & Montecinos, 2001; Kewley, 1998; Onwuegbuzie, 2001; Persons, 1998; Phipps, Phipps, Kask, & Higgins, 2001; Rama, 2003; Slavin, 1996).

While cooperative learning as an instructional methodology is an option for teachers, it is currently the least frequently used (Johnson & Johnson, 1991). Goodlad (1984) reported that most classroom time is spent in "teacher talk", with only 1% of the students' classroom time used for reasoning about or expressing an opinion. Although the research findings approve the advantages of cooperative learning, almost all EFL teachers in Iran still find difficulty incorporating this system of instructional method in their classrooms. In addition, a main problem is that a little attention has been given to the investigation of the effects of CL strategies specially STAD on the intermediate and advanced EFL learners' language achievement. Also, most teachers are facing large heterogeneous classes, making it difficult to serve the needs of all the students in the class. CL approaches like STAD take advantage of this heterogeneity, by encouraging students to learn from one another and from more and less knowledgeable peers. These reasons motivated the researcher to investigate the effect of STAD on the intermediate students' language achievement.

A Brief History of Cooperative Learning

According to Johnson and Johnson (2002), in the late 1700s, Lancaster and Bell used cooperative learning groups extensively in England, and then in New York City in 1806. Within the Common School Movement in the United States in the early 1800s, there was a strong emphasis on cooperative learning. In the last three decades of the 19th century, Parker made it applicable. Following Parker, Dewey used cooperative learning groups as part of his famous 'project method' in instruction. In the late 1930s, however, competitive learning methods began to be emphasized in schools and in the late 1960s, individualistic learning began to be used extensively. In the 1980s, schools once again began to use cooperative learning (Johnson & Johnson, 2002). Today cooperative learning is applied in almost all school content areas and in college and university contexts all over the world, and is claimed to be an effective teaching method in foreign/ second language education by scholars (Zarei & Keshavarz, 2012).

Cooperative learning is one of the most important strategies of teaching, which seeks to promote cooperation and interaction between students and remove the negative trend of competition among them (Slavin, 1994). At present, there are many cooperative learning techniques and structures available. These methods and structures can be categorized into the following models: a) Student Teams Achievement Divisions (STADs), b) Teams-Games-Tournaments (TGTs), c) Learning Together (LT) d) Jigsaw Technique (JT) e) Group Investigation (GI) f) Team Accelerated Instruction (TAI) and g) Cooperative Integrated Reading and Composition (CIRC) (Slavin, Leavey, & Madden, 1986; Aronson & Shelley, 1997; Towns, 1998; Slavin, 2000; Seetharaman & Musier-Farsyth, 2003; Eilks, 2005; Oh & Shin, 2005; Doymuş, 2008a). The idea which lies beneath all cooperative learning methods is that students work together to learn and are responsible for one another's learning as well as their own (Slavin 1994).

Student Teams Achievement Divisions (STAD) as a Cooperative Learning Technique

STAD, one of the most straightforward approaches to cooperative learning, was developed by Robert Slavin and his colleagues at Johns Hopkins University (Slavin, 1978). It consists of five major components (Slavin, 1986): class presentations, teams, quizzes, individual improvement scores, and team recognition. In STAD, according to Slavin (1994), students are assigned to four-member learning teams that are mixed in performance level, gender, and ethnicity. The teacher presents a lesson, and then students work within their teams to make sure that all team members have mastered the lesson. Finally, all students take individual quizzes on the material, at which time they may not help one another. Students' quiz scores are then summed to form team scores, and teams that meet certain criteria may earn certificates or other rewards. The main purpose of STAD is to drastically improve and accelerate learner performance. Researchers reported that classes using cooperative learning showed an increase in achievement, attitude, self-esteem, and social relationships (Edwards et al., 1972; Edwards & DeVries, 1972; Gonzales, 1979; Slavin & Karweit, 1981; Ziegler, 1981; Slavin, 1989).

Theories Underlying Cooperative Learning

Four perspectives have been recognized in the literature to be associated with it: the Vygotskian perspective, the Piagetian perspective, Constructivism, and multiple intelligences and Kagan's structural approach.

The Vygotskian Perspective

The Vygotskian perspective related to cooperative learning is the Zone of Proximal Development (ZPD) and the ensued affect on Krashen's Input Hypothesis.

Vygotsky's central topic was the Zone of Proximal Development (ZPD), which uses social interaction with more knowledgeable others to move development forward. Fogarty (1999) stated, "Vygotsky's theory suggests that we learn first through person-to-person interactions and then individually through an internalization process that leads to deep understanding" (p. 77).

The Input hypothesis is Krashen's explanation of how second language acquisition takes place. According to this hypothesis, the learner improves and progresses along the 'natural order' when he/she receives second language 'input' that is one step beyond his/her current stage of linguistic competence. Since not all of the learners can be at the same level of linguistic competence at the same time, Krashen suggests that natural communicative input is the key to designing a syllabus, ensuring in this way that each learner will receive some 'i + 1' input that is appropriate for his/her current stage of linguistic competence (Schütz, 2007).

The Piagetian Perspective

In contrast to the Vygotskian perspective, that is, learning which results from social interaction leads to cognitive development, Piaget's theory suggested that it is cognitive development which leads to learning (Liang, 2002). According to Liang (2002), a central component of Piaget's developmental theory of learning and thinking is that both involve the participation of the learner. Knowledge is not merely transmitted verbally but must be constructed and reconstructed by the learner. Piaget further asserts that for a child to know and construct knowledge of the world, s/he must act on objects and it is this action that provides knowledge of those objects (Sigel & Cocking, 1977).

Bandura's Social Learning Theory

Social learning theory talks about how both environmental and cognitive factors interact to influence human learning and behavior. It focuses on the learning that occurs within a **social context**. It considers that people learn from one another, including such concepts as observational

learning, imitation, and modeling (Abbott, 2007). By observing others, people acquire knowledge of rules, skills, strategies, beliefs, and attitudes.

Constructivism

A focus on student-centered learning might well be the most important contribution of constructivism (Cheek, 1992; Yager, 1991). According to Liang (2002), the theory of constructivism looks at the way a learner learns. It, therefore, has direct application to education. Constructivists believe that the learner learns best when he/she is actively engaged. The student is viewed as one who acts on objects and events within his or her environment and in the process gains understanding and derives meaning of those objects and events. The theory suggests that humans construct knowledge and meaning from their experiences (Liang, 2002).

Types of Cooperative Learning Groups

There are three commonly recognized types of cooperative learning groups. Each type of group has its own purpose and application (Johnson, Johnson, & Holubec, 2008).

Formal Cooperative Learning

Formal cooperative learning consists of students working together, for one class period to several weeks, to achieve shared learning goals and complete jointly specific tasks and assignments (Johnson, Johnson, & Holubec, 2008).

Informal Cooperative Learning

Informal cooperative learning consists of having students work together to achieve a joint learning goal in temporary, ad-hoc groups that last from a few minutes to one class period (Johnson, Johnson, & Holubec, 2008). During a lecture, demonstration, or film, informal cooperative learning can be used to focus students' attention on the material to be learned, set a mood conducive to learning, help set expectations as to what will be covered in a class session, ensure that students cognitively process and rehearse the material being taught, summarize what was learned and pre cue the next session, and provide closure to an instructional session (Johnson & Johnson, 2008).

Cooperative Base Groups

Cooperative base groups are long-term, heterogeneous cooperative learning groups with stable membership (Johnson, Johnson, & Holubec, 2008). Members' primary responsibilities are to (a) ensure all members are making good academic progress (i.e., positive goal interdependence) (b) hold each other accountable for striving to learn (i.e., individual accountability), and (c) provide each other with support, encouragement, and assistance in completing assignments (i.e., promotive interaction) (Johnson & Johnson, 2008). These three types of CL may be used together (Johnson, Johnson, & Holubec, 2008).

Five basic Elements of Cooperation

The most important feature of cooperative learning is that individuals study in small groups by helping each other to learn to achieve a mutual goal. However, not every study group can be stated as a cooperative learning group (Saban, 1994). Because placing socially unskilled students in a group and telling them to cooperate do not guarantee that they have the ability to do so effectively (Sharan & Sharan, 1990; Johnson & Johnson, 1991, 1994; Slavin, 1991; Açıkgöz, 1992; Johnson, Johnson & Holubec, 1994; Saban, 1994). Thus, in order to provide a suitable condition for cooperative learning in the classroom, some basic principles should be taken into consideration. A visual representation of this concept is presented in figure 1 below.

Figure 1 'five pillars' model of cooperative learning (Cited as Jones & Jones, 2008)

As shown in the above graphic, this 'five pillars' model provides the foundation for building successful Cooperative Learning in the classroom.

Cooperative Learning Classroom Design Patterns

Select a design pattern with which you feel comfortable and fits the dimensions of your classroom. Changing classroom design throughout the year for variety is always a good idea. Variety is always a good thing (Ervin, 1996). The three design patterns that are displayed in the graphic below (Figure 2) are the more common design patterns, with the traditional and modular designs probably being the most common. Notice, too, the interaction patterns in each design (Ervin, 1996).
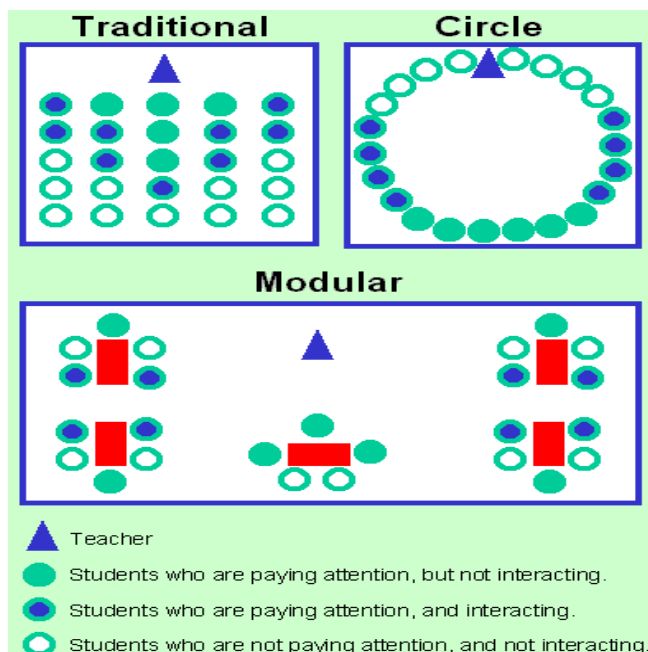

Figure 2 three design patterns in class.

Research Questions

Thus, the following questions are raised:

Does STAD significantly affect EFL learner's language achievement?

Does STAD have different effect on females and males?

Methodology

Participants

To carry out the investigation, 80 female and male (48 females and 32 males) EFL students at the intermediate level of English proficiency studying in Jahad Daneshgahi Language Institute in Urmia, Iran, were chosen and assigned to two groups based on the placement test results. One of the groups was identified as the cooperative (experimental) group in which the cooperative learning method of Student Teams Achievement Divisions (STAD) was used (n = 40), and the other group was identified as the control group in which the traditional method was used (n = 40). They were randomly assigned to control and experimental groups. The participants were chosen between 14 and 18 years of age. The number of instructional hours for the course was 30 hours. That is, the intervention was spread over 20 class sessions over a period of one semester. The participants were divided randomly into two groups: one experimental and one control. Since 40 is too large a number for the students in one English class, a collection of two classes for each group were used, that is, two classes for the experimental group of 40 participants and two classes for the control group of again 40 participants.

Instrumentations

Pre-test Achievement Test (PTAT): In this study, Top Notch Achievement Test 1 as a pre-test was used to validate the equivalence of the academic ability of the groups before the treatment, and also, it was used as a covariate to allow an estimate of the increase in achievement after the treatment. It was administered to all the students before treatment. The test consists of 30 multiple-choice items. It focuses on the students' general knowledge of the English course.

Post-test Achievement Test: Top Notch Achievement Test 2 as a Post-test was administered to the two groups after treatment. Any difference between the Pre-Test and the Post-Test might have been due to treatment given to the both groups. At the end of the course, all participants underwent a 30 multiple-choice item achievement post-test in order for the researchers to detect any significant differences between the mean scores of the two groups. It focused on the basic knowledge of the English course and was used to measure achievement after the treatment.

Both the Pre-Test Achievement Test (PTAT) and Post-Test Achievement Test were almost parallel, in other words they were equal in content, difficulty level, and psychometric properties. All 30 items in both tests were presented in a multiple-choice format. Each item had four alternative choices for the correct answer. The administration of the whole test took 45 minutes for each pre-test and post-test. The content validity of both tests was checked before. Both tests were piloted with English students of another class (N=40) before the main phase of study for estimating the reliability. The reliability of the pre-test is 0.71, and the post-test is 0.86. It is, therefore, accepted that both tests have good reliability and discriminatory power.

Procedures

The present investigation is a quasi-experimental research which is used the two group pre-test post-test design. The sample of the study consisted of four classes from Jahad Daneshgahi Language Institute in Urmia, Iran. The sample was divided into two groups (experimental group and control group). One section of 40 students was taught by the cooperative learning method of STAD and the other of 40 students by traditional method. Both groups were taught the same content and materials for 20 instructional sessions. The Pre-test Achievement Test (PTAT) was administered to both treatment groups as Pre-test in order to determine their knowledge of the subject and to ascertain the homogeneity of the treatment groups. The Post-test Achievement Test was administered to the two treatment groups after teaching the groups for 13 weeks using the same scheme of work. After treatment, the scores in Post-test in both groups were collated and subjected to appropriate statistical analysis. Most class periods for the experimental class consisted of

presentation of the content to understand the assigned material and master the worksheet. During this, students discussed the material and helped each other to clarify and understand the material. They finally discussed and answered questions on the work sheets. At the end of a lesson, the team with the highest points was recognized and applauded. Following team practice, students took test on each unit and the teacher scored and calculated a team average score. During test, help was not allowed. After the unit test, team with the highest score was declared as winner. The control group was taught the usual lecture discussion method. Topics which were taught to both groups were the same. English achievement of the students was measured by the achievement test. This test was used as the post tests.

Further series of analysis of variance were carried out to assess in order to see whether CL strategies differently affects males and females. So, mean scores (X), standard deviation (Std. Dv.) and t-test were calculated and results in experimental group were analyzed.

Results and Discussion
Data Analysis for the Top Notch Achievement Test 1 as a Pre-test

To make sure that the participants of both groups were homogenous, Top Notch Achievement test 1 as a pretest was administered to the participants of both experimental and control groups. After administering the test, the mean scores of the two groups on the test were calculated and compared. Comparison of pre-test scores of both the experimental and control groups by applying statistical analysis indicated that there was no significant difference between the two groups (Table 3), and both groups were almost equal in their level of English knowledge.

In this section, the frequency, percentage and other information about two groups in pretest achievement test are presented in following tables (Table 1 and Table 2).

Table 1 Descriptive statistics analysis of the scores of Experimental group

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
8	1	2.5	2.5	2.5
9	4	10.0	10.0	12.5
10	6	15.0	15.0	27.5
11	4	10.0	10.0	37.5
12	10	25.0	25.0	62.5
13	6	15.0	15.0	77.5
14	5	12.5	12.5	90.0
15	4	10.0	10.0	100.0
Total	40	100.0	100.0	

Table 2 Descriptive statistics analysis of the scores of the Control group

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
8	1	2.5	2.5	2.5
9	4	10.0	10.0	12.5
10	7	17.5	17.5	30.0
11	6	15.0	15.0	45.0
12	7	17.5	17.5	62.5
13	6	15.0	15.0	77.5
14	6	15.0	15.0	92.5
15	3	7.5	7.5	100.0
Total	40	100.0	100.0	

The following table, Table 3, presents the descriptive statistics of both experimental and controls.

Table 3 The descriptive Statistics of pretest by the two groups

		Experimental Group	Control Group
N	Valid	40	40
	Missing	0	0
Mean		11.9000	11.7750
Std. Error of Mean		.30128	.30061
Median		12.0000	12.0000
Mode		12.00	10.00[a]
Std. Deviation		1.90546	1.90125
Variance		3.631	3.615
Skewness		-.107	-.013
Std. Error of Skewness		.374	.374
Range		7.00	7.00
Minimum		8.00	8.00
Maximum		15.00	15.00

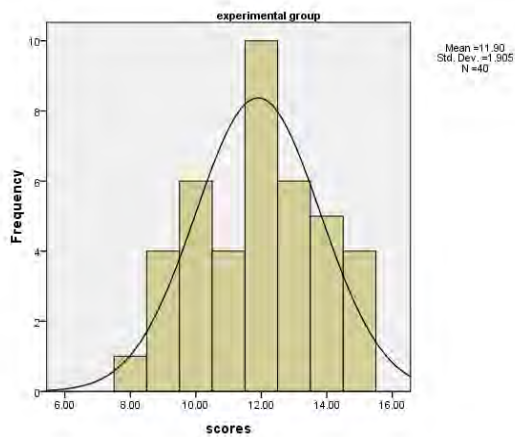The Bar charts of the pretest as a homogeneity test are available as follows:

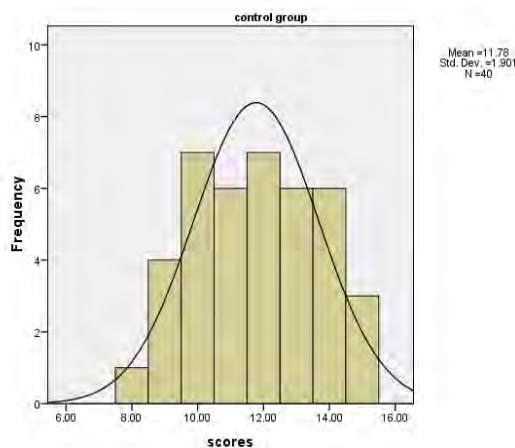**Figure 3 Bar chart of the experimental group on the pretest**

Figure 4 Bar chart of the control group on the pretest

Data Analysis for the Post-Test

H_{01}: STAD does not affect EFL learner's language achievement.

The results support the notion that cooperative learning can facilitate the learning of language. All participants in both groups were tested at the end of the study by means of the Top Notch Achievement Test 2 as a Post-test to see the impact of applying STAD technique on EFL learners' language achievement. An independent sample t-test was run to compare the mean scores of the two groups on the post-test.

The descriptive statistics for the two groups are displayed in following tables:

Table 4 Descriptive Statistics of post test by the two groups

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance
experimental	40	5.00	15.00	20.00	17.4500	.21469	1.35779	1.844
control	40	6.00	14.00	20.00	16.7250	.22923	1.44980	2.102
Valid N (listwise)	40							

Table 5 Independent t-test of Post-test between experimental and control groups

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
post-test	Equal variances assumed	.061	.806	2.308	78	.024	.72500	.31407	.09974	1.35026
	Equal variances not assumed			2.308	77.667	.024	.72500	.31407	.09970	1.35030

Table 5 indicates the mean scores for the experimental and control groups were 17.4500 and 16.7250. Based on the results, it could be concluded that there was a significant difference between the mean scores of the two groups on the posttest. The experimental group performed significantly better than the control group on the post-test. The results showed that the difference between the post-test mean scores of the two groups was significant at 0.05. So, the experimental group, which had engaged in STAD produced a higher improvement in scores on the post-test when adjusted for pre-test scores. Thus, it could be concluded that the null-hypothesis which was 'STAD technique does not affect EFL learner's language achievement' was rejected.

Table 6 Significance of difference between mean scores of the Experimental group of pre-post test (N=40)

	Mean	Std. Deviation	Std. Error Mean
Pre-test	11.9000	1.90546	.30128
Post test	17.4500	1.35779	.21469

Table 6 reveals the mean scores of the pre-post achievement test results of the experimental group. The experimental groups' mean scores on the pre and post tests are 11.9000 and 17.4500 respectively. The table reflects a higher result in the post test compares with the pre-test score. The standard deviations of the group on the pre and post tests are 1.90546 and 1.35779 respectively. This shows that the difference among the students' post score is smaller than that of the pre test score. Thus, the experimental group's pre and post test mean scores are somewhat different.

Data Analysis for the Gender Differences in Language Achievement

H_{02}: There is no significant difference between the mean score of females and males.

The hypothesis of the study investigated whether there are gender differences in English language achievement after students were taught the English topics by use of STAD. Means and standard deviation of the students' achievement on the pre-test were calculated due to group (experimental and control) and gender (male and female) variables as shown in Table 7.

Table 7 Means and Standard Deviations of the students' Achievement on the Pre-test due to group and gender variables

Group	Sex	Mean	Std.Deviation	N
Experimental	Male	12.1176	1.90008	17
	Female	11.7391	1.93573	23
	Total	11.9000	1.90546	40
Control	Male	12.4000	2.02837	15
	Female	11.4000	1.75594	25
	Total	11.7750	1.90125	40
Total	Male	12.2588	1.96422	32
	Female	11.5695	1.84583	48
	Total	11.8375	1.90335	80

Table 7 above indicates that there are slight differences in the means of the pre-achievement test due to group and gender variables. For the experimental group, the male and female means were 12.1176 and 11.7391 respectively, while for the control group it was 12.4000 and 11.4000 respectively for male and female subjects. The result in Table 7 indicates that the difference in pre-test mean scores between male and female students was statistically significant, $p < 0.05$, with male students having higher mean score than female students.

Means and standard deviation of the students' achievement on the post-test were calculated due to group (experimental and control) and gender (male and female) variables as shown in Table 8.

Table 8 above indicates that there are slight differences in the means of the Post-achievement test due to group and gender variables. The hypothesis of study that there is no statistically significant gender difference in language achievement of students who learnt through STAD, was therefore retained. This implied that, male and female students who learnt through STAD performed equally well in English while male and female students who learnt through the conventional methods performed differently with male students attaining higher scores.

Table 8 Means and Standard Deviations of the students' Achievement on the Post-test due to group and gender variables

Group	Sex	Mean	Std.Deviation	N
Experimental	Male	17.5294	1.32842	17
	Female	17.3913	1.40580	23
	Total	17.4500	1.35779	40
Control	Male	16.6000	1.54919	15
	Female	16.8000	1.41421	25
	Total	16.7250	1.44980	40
Total	Male	17.0647	1.438805	32
	Female	17.0956	1.410005	48
	Total	17.0875	1.403795	80

Conclusion

The results of the study showed that there was a statistical significant difference at the level of 0.05 between the means of the performance of the experimental and control groups on the achievement test for the benefit of the experimental group. Hence, it can be concluded that STAD has positive effects on the learners' language learning. The findings of this study also showed that there was no statistically significant gender difference in English language achievement for students who were taught through STAD. Therefore, the STAD proved to be more effective in enhancing English language achievements for male and female students than the conventional teaching methods. In this study, both boys and girls seemed to equally benefit while learning English concepts cooperatively. This implied that, male and female students who learnt through STAD performed equally well in English while male and female students who learnt through the conventional methods performed differently with male students attaining higher scores.

These findings can have implications not only for teachers and learners, but also for syllabus designers and material developers. It is hoped that the study will be helpful to English teachers to better understand how STAD be used successfully in foreign language learning classes. Teachers should give time to students in order to make them interact with their peers in the groups in class than make students only do the activities in student textbooks.

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