



Effects of Cooperative Learning and Group Study on Reducing Test Anxiety

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Abstract

Cooperative learning is one of the active methods of education that has attracted the attention of experts. The present study was designed to assess the precise impact of cooperative learning through learning together on the reduction of test anxiety. In this study, cluster sampling was used. This research is a quasi-experimental field study and was carried from early February 2012 at Islamic Azad University of Hamedan. Method of this study was quasi-experimental that has been performed using repeated measurements in experimental and control groups. The number of experimental group was 20 people and the number of control group was 16 people and 4 people were randomly removed, in other words the two groups included 16 people. In the analysis of the test, Kolmogorov - Smirnov tests ANOVA, t-test, independent and multivariate analyses of variance (MANOVA) were used. The results of this study suggest that collaborative learning reduces test anxiety at Islamic Azad University and there is a significant relationship between dependent and independent variables with a confidence level of 95%. In this paper, the study of anxiety in men and women and their comparison showed that there was not much difference variance and is almost identical in both men and women.

Keywords: Collaborative learning, group study, test anxiety.

Introduction

Given that knowledge and information science is constantly evolving, and previous data become old and their defects become obvious, but accumulating minds of students in schools with information sciences is not enough and will never be able to prepare them to enter into real life outside of school. So educators should pay attention to learning methods rather than just different types of knowledge and schools should provide opportunities for students to learn practically.

Today, the prosperity of any community depends on the success of education and teachers' knowledge and skills. The role of human resources in the education system's role is irreplaceable. If the education system has problems that may jeopardize their academic tasks, these forces will find their ability to apply knowledge. The lack of a positive attitude toward teaching methods in the teaching: learning process will lead to non-optimal use of active teaching methods^{1,2}.

On the other hand, in today's conditions that the breadth of available information is inconsistent with the ability people to use them, the teacher should not only transfer information as a repository of knowledge but should lead them toward to the stage of thinking and raise their reasoning skills and also to getting right solution based on a combination of learning³.

Good and efficient teachers try to involve all learners in the management of class to help them feel classes run together,

because giving opportunities to learners satisfies their glaring needs. The result is the depth and breadth of their learning⁴.

There are several ways to learn and some of these techniques rely on the reserved memory and learner simply tries to memorize the contents provided by the teacher but some other methods induce thinking. In these methods individuals are not only passive but also quite actively learn, among these methods are the method of cooperative learning; where the Individual participates in the group and learns in the group.

According to the experiences gained in the laboratory, work organizations and classrooms have continually shown that the structure of partnership goals is much more beneficial than competitive structures. In the process of collaborative learning, partnership is a reward that reinforces the motivation to perform common tasks, expands a remarkable friendship among group members and creates more interaction and exchange of ideas⁵.

Proponents of this approach argue that Students and adults should cooperate with each other rather than competing to succeed at work and in social relationships. They also believe that important life skills such as speaking, listening; Consistency, conformity and problem solving can be learned through experience.

In the cooperative approach, students have the capacity to analyze and evaluate ideas, thoughts, and criticisms. This method gives the opportunity to students to share their theories

and ideas with the others and express their thoughts with documentary evidence. In fact, using the methods of teaching – Learning as group activity is pursued in two objectives: Reforming and strengthening understanding and thinking skills in students, Reforming and strengthening the skills of teamwork and respecting for different ideas, Aside from the impact of cooperative approach on the success, intergroup relations, entering exceptional students to the routine training and self-esteem, the tendency of students to school, the sense of mastery in school, reduced fear and anxiety, participation and altruism can be noted⁶.

Fear and anxiety of learners is learned usually by teachers or schools and the cognitive and functional abilities of learners can be effective with respect to the degree of anxiety. So that the learning tasks are associated with positive event and the emphasis is on participation and group competition can significantly reduce test anxiety. The best way to deal with the adverse reactions of people is using the Blackout Method or classical conditioning in education, For example, to help learners to voluntarily put themselves in situations provoking anxiety and their success⁷.

Although academic achievement is affected by several factors, but we cannot ignore the role of test anxiety on academic performance. Test anxiety is a type of anxiety that becomes apparent with fear of failure in the performance capabilities of the task⁸. Most of dropout is among students who have test anxiety. Also, studies show that about 10 percent of the students with test anxiety require treatment and the risk is rising⁹.

In addition, it is important to recognize anxiety in the educational process. Parents impose 1 educational expectations of the learners and do not pay attention to undesirable results. Such a process is repeated at the school; when academic problems and weaknesses are assessed by teachers or with peers, the alarming results of past failures will have an impact on the anxiety of learners and more anxiety increases the academic failure.

Test anxiety in learners could affect their performance, and the low academic performance can also cause test anxiety in students, and Students will not 1 gain the desired result and it will lead to the increasing dismay and reluctant.

Review of literature: Theoretical framework: Collaborative learning is an instructional template or framework in which heterogeneous groups of learners are shaped by the teacher. Within each group of learning students engage in numerous activities that require cooperation and mutual support³.

Theoretically, this approach is also favored by behaviorists and other experts of learning. According to behaviorists, strengthen the success of the major methods of strengthening teaching and learning. In terms of cognitive Social theory of Bandura When it comes to a situation in which students have the right to do

anything they see their friends doing it to learn and when their Success is enhanced they are more enthusiastic to do it. According to Wigotski those Students who do not come alone to cope with their problems learn it when take advantage of their teachers and friends¹⁰. Research in the field of collaborative learning began in the early part of this century and the beginning of the 1920 but the number and quality of research began to increase rapidly in the early 1970s. Hundreds of studies tested the collaborative learning with a variety of control methods on a range of issues.

It is important to recognize that the teamwork is not necessarily collaboratively. Students may work individually or in a team competition and just try to maintain the appearance of teamwork, But in working collaboratively, learners work together to achieve shared objectives of lesson in a non-competitive learning¹¹.

Collaborative learning: refers to the way in which learners work together in small groups and are strengthened for their collective achievements¹⁰.

Group Study: The way in which learners work mainly together to learn relatively specific subject knowledge and academic skills. Topics learning these things have become so well organized stuff¹⁰.

Test anxiety: The person's concern about performance (expected failure), ability (their thoughts minimization) of the examination and assessment of the situation¹².

Anxiety is the fear of the unknown and uncertain factors that cause frequent and sometimes distressing symptoms including palpitations and pallor alarmed as well. Thus, in the process of anxiety unlike the natural fear there is no an actual real and frightening and dangerous or harmful but the person automatically feels anxiety¹³.

WHO defines anxiety as part of a series of protests – psychic features that cannot be attributed to specific risk and its Symptoms as attacks¹⁴.

Test anxiety is one of the situational anxieties that is closely related to the performance and academic achievement of millions of students in training centers. It is as old as the tests that have been made for performance evaluation¹⁵.

There are Essays on the nature of test anxiety related to the five decades ago but the study' of anxiety seriously began since four decades ago with the study of Sarason and Mendlr¹².

Test anxiety is a mental preoccupation that is determined with self-doubt and self insult. The cognitive activities also affect overt behavior and physiological responses. These behaviors and actions are the products of the history of the person and acts as a mediator between experience and behavior. This mental

preoccupation attracts the attention of the person and interferes in the performance by reducing the proportion of attention associated with a task and also disrupts encoding and transmission of data. Saying sentences such as I'm stupid or I won't be accepted interfere with the problem solving. Concern is undoubtedly related to the attention and provokes cognitive activities. Many researchers have also emphasized the role of cognitive test anxiety. For example, Vienna obtained evidence that Individuals with higher test anxiety have a mental preoccupation with the contents of their lessons than those with low test anxiety¹⁶. Hulendurt et al pointed out that people with test anxiety are more involved in mental preoccupation (recognizing the deterrent tasks) that harms the performance. Although research about adults has shown that people with high anxiety have more recognition task during the test compared to those with low test anxiety but children show different patterns. As adults, children with high test anxiety are more involved with thoughts inhibiting their homework and negative evaluations; it is amazing those children with high test anxiety by facilitating the assignment¹⁷.

Background of Research: Cooperative learning was introduced at the beginning of the twentieth century by John Dewey. History of limited studies about partnership in learning goes back to 1920s, while researching the special applications of collaborative learning in the classroom began in the early 1970s. In a study conducted by Michael router in London, the educational progress of learners over several years. This was repeated several times during 1970 and 1974 learners and teachers were interviewed and classroom activities were observed. The router considers important factors including the quality of interaction between teacher and student, working and caring atmosphere between teachers and students, and preparing course materials¹⁸.

John Dewey in the books of Ethics in Education, How We Think, Interest and effort in education, Tomorrow's Schools, Democracy and Education tried to prove that the a democratic society requires the people work together to understand each other's worlds, therefore education in a democratic society encourages freedom of thought and conflicting interests to facilitate growth¹⁹.

Sahebalzamani and Zirak in the study examined the learning and study strategies of students in Isfahan University of Medical Sciences and its level with test anxiety. This cross-sectional study was performed on 200 students of Isfahan University of Medical Sciences in 2012. The sampling method was Quota sampling and the samples in this study included the students of Nursing, midwifery, medical library and information science at the undergraduate level. Students completed two questionnaires Stein learning and study strategies and Sarason test anxiety and the scores from the two surveys were examined. For statistical analysis, Pearson correlation test and ANOVA were used using SPSS software. The scores obtained were compared with the scores of students in America. The results showed that there is a

significant relationship in the opposite direction among the components of learning and study strategies and test anxiety. In fact, the use of learning and study strategies can be used as one method used to reduce test anxiety²⁰.

Sepehrian and Rezaei in a study examined the prevalence and impact of coping therapy on reducing test anxiety and increase academic performance high school girls. The survey was conducted in schools of Saqez and 20% (160) students were selected in a randomized manner and 41 of them were diagnosed severely distressed through clinical interviews and Spielberger Test Anxiety. 40 students were placed in the experimental group and control group. T-test and analysis of covariance and frequency were used for data analysis. Results showed that the prevalence of test anxiety among girl students was performed s in the third grade of high school in Saqez as 25.62 and there is a significant relationship between experimental and control groups at different levels. There was a negative correlation between test anxiety and academic achievement²¹.

Keramati in his dissertation entitled "A study on the impact of collaborative learning on social skills and academic achievement in math, fifth grade students in Mashhad." examined the impact of cooperative learning on students' social skills and academic achievement in math. He reached the conclusion that the positive changes in the experimental group is significant compared with the control group who had been trained in the traditional way²².

Izadian poor, Yousefi and Haqani, conducted a research aims to investigate the impact of cooperative education on student achievement in statistics and modeling studies. Quasi-experimental research method used in this study, the results showed that there are significant differences between test and control groups. Those students who were taught collaboratively had the high-achievements compared to those who were taught traditionally²³.

Baros in a study examined the impact of cooperative learning on academic achievement, motivational and social factors in the economy are high. This research is a case study and it aims to clarify the application of learning strategies in a small group of twelve students of economics were as Learners who were present in the tests. This method affected the skills of students and teachers about the collective and individual learning, distinct group roles and accountability and the test results in the case study. Findings were consistent with the literature on collective learning courses in middle school and high academic achievement and positive motivational and social factors²⁴.

Methodology

Research Methodology: According to the research topic and its objectives which are the study of the effect of teaching with student-centered strategies (cooperative learning) on test anxiety

on the academic achievement of students in Hamedan Azad University in 2011-2012, Quasi-experimental research methods (two group design with pretest and posttest dissimilar) are used.

The experimental projects, in which random assignment cannot be used, are called quasi-experimental designs²⁵.

These designs are used in situations where there is no possibility of using experimental designs. In the use of quasi-experimental designs, more control can be over the factors threatening the external validity.

Statistical population: The population used in this study consists of all graduate students at the Hamedan Azad University in 2011-2012. The number of population members is 904 people.

Sample and sampling method: In this study, cluster sampling was used. Because a full list of the statistical population of the study was not available, the group selection of members was more feasible and easier. Thus School of Humanities was elected among the Faculties of Islamic Azad University, Hamedan, including the College of Engineering - Science and Art and Humanities. Educational Psychology was selected among the fields of study in the Faculty of Humanities and the course of changes and modification of behavior was selected among the courses taught in this field of study. The teacher was coordinated to teach in the usual way in one class and teach in collaborative learning in another class. They formed control and experimental groups.

Group of experimental consisted of 20 people and the control group consisted of 16 people and 4 people were removed randomly. The two groups consisted of 16 people.

The research design: In this study, quasi-experimental design of two heterogeneous groups with pre-test and post-test of control group was used. Experimental designs in which the random assignment cannot be used are called quasi-experimental designs.

One class was taught with cooperative learning method and another one was taught with conventional method. The impact of collaborative learning as an independent variable on the level of student achievement and test anxiety can be determined as dependent variables.

This design can be represented as follows:

(E) experimental group	O ₁	X*	O ₁
control group (C)	O'	x	O ₂

Where O' is pre test, x * is test function, X is control operation and O is post test²⁶.

Test anxiety and TAI test: Test Anxiety questionnaire TAI consists of 25 items that subjects respond to it based on a four-option scale (never = 0, rarely = 1, sometimes = 2, often = 3). In this test, a minimum score is zero and a maximum one is 75. The higher is the score, the greater is the anxiety. This scale aims to measure test anxiety and was made by Abolqasemi by Asadi Moghaddam, Najarian and Shekarkan in 1996.

Internal consistency: To assess the internal consistency TAI Cronbach's alpha coefficient was used. Based on the results of the alpha coefficients for the total sample, female subjects and male subjects are respectively (0.94, 0.95, 0.92).

Retest reliability: to assess the validity of TAI, this test was given to 1 male subject and 90 female subjects who participated in the early phases after four weeks to six weeks. The mean and standard deviation of all subjects, male subjects and female subjects, were respectively (SD = 19.44) x = 36.2, (SD = 15.8) x = 32.28 (SD = 17.26) y = 34.24.

The correlation between the test and retest scores in two subjects for all subjects, female and male subjects, respectively (r = 0.67), (r = 0.88), (r = 0.77) are which is satisfactory.

Validity: To assess the validity of TAI, this measure simultaneously with Anxiety Inventory and Self-Esteem Scale were given to students.

20-item scale of Anxiety questionnaire was made by factor analysis and benefits from acceptable and satisfactory psychometric properties. The correlation between the total scores of the entire sample of subjects in the general anxiety scale, or TAI, male subjects and female subjects, was respectively (p = 0.001) r = 0.72, r = 0.67's.

In order to assess the validity of the TAI, Cooper-Smith Esteem Scale was used that has 58 items and has satisfactory reliability and validity (Yensy, 1979). The correlation scores of all subjects, male subjects and female subjects were respectively r = -0.43, r = -r = 0.68, r = -0.57 (p = 0.001)²⁷.

Results and Discussion

Method: This study is a quasi-experimental and field one and was carried out at Islamic Azad University of Hamedan from the early February 2011.

The teacher was coordinated to teach in the usual way in one class and teach in collaborative learning in another class. They formed control and experimental groups.

Descriptive Statistics: The below table shows that the mean scores of anxiety among women is less than men. The range of obtained scores and the standard deviation of scores are higher in women than men.

Table-1
Evaluates the statistical data related to anxiety scores according to gender (male and female)

Minimum	Maximum	Variance	Std/Deviation	Median	Mean	Accurate values (n)	Gender
12	46	142.26	11.92	27	26.62	8	Male
1	73	338.6	18.4	19.5	25.79	24	Female

Table-2
Evaluates the statistical data related to anxiety scores for each group (experimental and control)

(Minimum)	(Maximum)	(Variance)	(Std/Deviation)	(Median)	(Mean)	Correct values	Group
9	36	71.58	8.46	18.5	20.12	16	Experimental
1	73	440.65	20.99	31	31.87	16	Control

The table-2 shows that the mean scores of test anxiety in the control group are higher than the experimental group. The range of obtained scores and the standard deviation of scores are higher in control group than experimental group.

Inferential statistics: Kolmogorov: Smirnov must be used to assess the normality of the study variables before the study of research hypotheses.

Table-3 presents the study of variables' normality.

According to the table-3 it can be concluded that the Significant levels of post-test and pre-test variables of test anxiety are more than 0.05. Therefore, these variables are normal and the normality of these variables can justify the use of parametric tests to infer the research hypotheses.

Analysis of research hypotheses: Teaching using collaborative learning (study group) reduces test anxiety of postgraduate students in Islamic Azad University.

Hypothesis H₀: Teaching using collaborative learning (study group) does not reduce test anxiety of postgraduate students in Islamic Azad University.

Hypothesis H₁: Teaching using collaborative learning (study group) reduces test anxiety of postgraduate students in Islamic Azad University.

$$H_0 : \mu_1 = \mu_2$$

$$H_1 : \mu_1 \neq \mu_2$$

To confirm the above hypothesis, parametric test of ANOVA was used. In this hypothesis, the variable of cooperative learning is examined as the independent variable and test anxiety is examined as the dependent variable.

Table-4 examines the relationship between dependent and independent variables using the above test.

The table-4 shows that the significance level obtained from the F-statistic is less than 0.05, thus there is a significant relationship between the dependent and independent variables at the 95% confidence level. Thus Teaching using collaborative learning (study group) reduces test anxiety of postgraduate students in Islamic Azad University. The second sub-hypothesis of this study is confirmed and the null hypothesis is rejected.

Table-3
Evaluation of the normal status of variables

Test Anxiety	Explanatory pre test	Explanatory post test	Variables Useful statistics
0.885	0.585	1.035	test Kolmogorov-Smirnov Z
0.414	0.884	0.234	Significance level Asymp. Sig. (2-tailed)

Table-4
The study of the relationship between dependent and independent variables in the second sub-hypothesis

Significance level	F-statistic	The mean square	Degrees of freedom	The sum of squares	second sub-hypothesis
0.046	4.312	1104.5	1	1104.5	Inter-group
-	-	256.11	30	7683.5	Intra-group
-	-	-	31	87.88	sum

MANOVA test is used to confirm the hypothesis. In this hypothesis, the variable of cooperative learning is the independent variable and the academic achievement variable is the dependent variable. Table-5 examines the homogeneity of variance matrix using the Box-test.

Since the significance level is greater than 0.05 therefore, the variance matrices are equal and identical and one of the conditions of the test is confirmed.

Table-6 examines the equality of variances using the Leuven test.

Table-7 Examines the main hypothesis of the study with the above test.

The above table shows that the effect of F-statistic is less than 0.05, so there is a significant relation between independent variables with dependent variables at the 95% confidence level. The eta squared contribution is greater than 14%, which indicates a high effect size. Thus Teaching using collaborative learning (study group) does not reduce test anxiety of postgraduate students in Islamic Azad University, Hamedan. The main hypothesis of this study is confirmed and the null hypothesis is rejected.

Another finding of this study is studying the anxiety in men and

women and comparing them. This hypothesis is expressed thus:

There is a significant difference in test anxiety among men and women.

Hypothesis H_0 There is no a significant difference in test anxiety among men and women. Hypothesis H_1 There is a significant difference in test anxiety among men and women.

$$H_0 : \mu_G = \mu_B$$

$$H_1 : \mu_G \neq \mu_B$$

To confirm the above hypothesis, Parametric correlation test is used to calculate the mean difference between two independent groups.

Table-8 also examined the differences between the groups dealing with test anxiety using t-test.

From the table-8 it can be concluded that the significance level of the mentioned in Leuven test is greater than 0.05 which shows the equality of variances in the two populations studied. Therefore one of the conditions of using parametric independent t-test is observed. However, the significance level of t-test is greater than 0.05 that shows no significance difference in test anxiety among men and women at the 95% confidence level.

Table-5
Homogeneity of variance matrix in the main hypothesis of the study

Significance level	Second DOF	First DOF	F-statistic	Box-test
0.515	162000	3	3.48	11.26

Table-6
Evaluation of equality of variances in the main hypothesis of the study

Significance level	Second DOF	First DOF	F-statistic	Variables
0.202	30	1	1.028	Test Anxiety

Table-7
Confirming the main hypothesis of the study

Eta Squared Parabola	Significance Level	F-statistic	The Test Value	Main Hypothesis
0.249	0.016	4.8	0.249	Pillai's Trace Effect Test

Table-8
Evaluation of the difference between men and women in terms of test anxiety

t-test				Leuven Test		
Mean difference	Significance level	Degrees of freedom	T-statistics	Significance level	F-statistic	
0.83	0.906	30	0.119	0.315	1.043	Equality of variances
0.833	0.884	18.89	0.148			Lack of equality of variances

Conclusion

The main hypothesis of this study was that teaching using collaborative learning (study group) does not reduce test anxiety of postgraduate students in Islamic Azad University. According to table-4, the hypothesis with the values of $f = 4.312$, $df = 1$, significance level of $p < 46\%$ it was concluded that the f is smaller than 0.05. So at 95% there is a correlation between dependent and independent variables. Thus Teaching using collaborative learning (study group) does not reduce test anxiety of postgraduate students in Islamic Azad University. The main hypothesis is confirmed and the null hypothesis is rejected.

The findings of the current research is consistent with the findings of Wigelfield and Hill, Wigelfield and Akelz, However, there is no direct research in relation to the hypothesis and the mentioned studies are also about the state of the class and Environmental Assessment by the learner and its relation to anxiety.

Understanding Anxiety in academic processes is of great importance, one factor that has an effect on anxiety is learning environment of the school and also inappropriate conditions of Learning environment, poor physical condition of classrooms are other important issues that can affect students' academic performance (Floropskar, translated by Hekmati and Associates, 1989). Learner's expectations are one of the affecting factors of anxiety, so that if the learner has a positive attitude toward his ability in his lessons, he will reach to academic achievements.

According to the above mentioned advantages of cooperative learning and the learning environment, such as multilateral engagement and alignment of seat and intimacy between learners and also the learning activities in the learning environment that creates positive and higher efficacy is expected success, therefore it can be concluded that Teaching using collaborative learning (study group) does not reduce test anxiety of postgraduate students in Islamic Azad University.

Suggestions for Future Studies: According to the research that took part in this study, there are some suggestions for further works as follows: It is recommended to test this research as a project organized in at least one of the courses at different educational levels as a legitimate and compelling learners and be mandatory in the case of satisfying the objectives. It is recommended to examine the extent of this study influence on various aspects of test anxiety among learner. It is recommended to make the elementary students familiar with this method of training to learn the skills of interaction and participation. It is recommended to make the elementary teachers familiar with strategies to reduce test anxiety.

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