A GENDER BASED COMPARATIVE STUDY OF COOPERATIVE LEARNING AND LECTURE DEMONSTRATION METHOD ON THE ACADEMIC ACHIEVEMENT AND ACADEMIC SELF CONCEPT AT ELEMENTARY SCHOOL LEVEL

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ABSTRACT

The study was conducted to explore comparative effect of cooperative learning and lecture demonstration method on the academic achievement and academic self-concept of elementary school students across the gender. All 5th class students of a private school comprised the population of the study. A sample of 40 students was selected randomly from Nayab English medium School Dera Ismail Khan. Two instruments were used for data collection. One was a self-made academic achievement test in mathematic subjects which was made valid and reliable through experts view. This test was to check the academic achievement after experiments. The second instrument was a modified version of the Self-description Questionnaire–I prepared by Marsh (1992) which was used to check the academic self-concept of the students. The result shows that the cooperative learning method was better than the lecture method in the development of academic achievement and academic self- concepts of the students. Across the gender the self-concept of female was significantly better than the male, while there was no difference in academic achievement across the gender.

Keywords: cooperative learning, academic self-concept, academic achievement, gender, high achievers and low achievers

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Background

Now a days research studies show that there exist a gap between the male and female mathematics achievement. The overall achievement in mathematics is gradually decreasing with the passage of time (Gutbezahl, 1995). When comparing the performance of male and female the men performance is better than women in the subject of mathematics (Hide et al, 1990), but there is no gender difference seen in problem solving achievement at primary and middle class level. It has been examined that boys performance is outstanding than girls at high and college level. The difference becomes very small when we apply these results in the overall population. However, cross-national variation in mathematical achievement among male and female have existed in all over the world. In the present study researcher tried to describe the gender related effects of group

work. The worldwide researches show that group work positively influences the achievement of the female students at the elementary school level. The female student achievement is better than male achievement, particularly in the areas of competitive ways of learning. It means that women are generally attracted towards group ways of learning.

Introduction

Seeking of knowledge is compulsory for every man and woman in Islam. The state (government) is responsible for providing basic needs of life and educational opportunities to all. The nation, which lacks education, dies soon. Education, formulates the system of a country, and it gets directives from the national aims and aspirations. Educational aims are influenced by the political, social, economic and religious conditions prevailing in a country (Kamran, 2012).

Education is a systematic process and mainly focuses on teaching and learning. The way of delivery has the key role in the overall education set up. The search for "How to teach?" means teaching methodology while giving the guideline, a teacher must opt the appropriate techniques and ways of motivating and encouraging the students. Education cannot be made more effective without teaching methodology. An appropriate and effective teaching method is a source of effective learning. Many educators suggest multiple teaching and learning techniques (Iqbal, 2004).

Majority of the teachers often use traditional method of teaching in Pakistan. Some times it becomes challenging to motivate the large number of students in one class to learn mathematics and others difficult subjects particularly with conventional learning methods.

Each learner has to complete the syllabus with in a fixed time period. With an outdated teaching method, it becomes difficult to pay individual attention to all students. Moreover sometimes a crack between weak and talented students also rises due to the outdated teaching methods (Khan, 2012).

Yadav, (2001) suggested that teachers face problems such as selection of suitable methods of teaching, planing and management, overcrowded classes, boring syllabus, teacher centered approach, examination system and the problem of motivation in mathematics teaching.

There are many traditional teaching methods like lecture method, the discussion method, etc., which are used in daily classroom teaching in Pakistani schools. These methods cover the minimum requirements of students in the classroom environment. So there is a need to adopt some new and innovative methods which can easily engage the students in learning process individually. The cooperative learning method is one of such methods which are used to solve the requirements

of all categories of students. Cooperative learning technique is beneficial for different subjects (Iqbal, 2004).

Literature Review

The word ‘cooperate’ means work together to achieve shared goals. It has social, economic and biological meaning and interpretation. In a social context, cooperation means social activity which gives mutual benefits to all participants. In economical context, production, purchase and distribution are different economic activities which are interlinked with cooperation activities. In the biological sense, cooperation is the “sensible or insensible behavior of living organisms for joint survival” (Iqbal, 2004, pp.14).

Cooperative learning is defined as “A small group of individuals working jointly to solve a problem and complete task”. All models of cooperative learning involve students' goal, reward, interdependence and cooperation in all types of matters (Artz & Newman, 1990). Through cooperative learning the classroom activities are arranged into academic and social learning experience (Slavin, 1995). It is different from group work, and it has been described as "structuring positive interdependence” (Kagan, 1990).

According to Hamachek as cited in Aasmat-uz-Zahra (2010) “Self-concept explains that particular aggregate of ideas, concepts and attitudes about oneself at any specific moment of time”. The term personality is also multidimensional, it includes character, temperament and self (Jerome Kagan, Segal, Havemann, Baum, & Dsmith, 2009).

There are very two important elements on the part of the students during learning. One is the academic self-concept and the other is an academic achievement. The self-concept is the combination of concepts and attitudes about something. Self-concept is a scheme which organizes our concepts, emotions and approaches and it varies from situation to situation. The second important element i.e., academic achievement is mostly neglected by the teachers. The students’ achievement at the elementary level is very low in mathematics. There are different reasons for low achievement. One of the main reasons suggested by the ex*p*erts of the subject is the method of teaching (Woolfolk, 1989).

Coleman (2008) indicates that several conditions are needed to improve positive self concepts which includes a feeling of being a part of the group, acceptance and respect within the group. Cooperative learning fulfills all the above requirements of the individual, so it increases the academic self concept of the learners at the initial school level.

According to (Mayer and Alexander, 2011) "there is a consensus among the researchers that cooperative learning lays a positive outcome on student success, but there remains controversy about why and how cooperative learning method affects achievements. What are the conditions under which cooperative learning works effectively?. Many researchers inspecting cooperative learning resulting in the attainments start with various assumptions" (p. 345).

Slavin (1995) identified 4-major perspective on the achievement effects of cooperative learning.

1. Motivational perspective
2. Social Structure or Social interdependence
3. Cognitive development
4. Cognitive elaboration

Achievement

An achievement is same as the successful completing of something. It is a noun, which means something completed successfully, up to the highest level, with greater effort, abundant bravery, etc. Achievement can be defined in the Dictionary of education as (1) Completion with the expertise of the performance in any type of skill and knowledge (2) Development in the school work. The term achievement stresses on the performance as well as demonstration which is considered to be prerequisite to accomplish it. This definition distinguishes achievement from learning. Performance means innovation or demonstration rather than mere reproduction or application in a particular situation. According to the second definition learning and achievement is altogether different from one another because learning is not necessarily a condition for achievement because a successful performance can occur due to luck by guessing it (Phye, 1997).

Academic achievement

Academic achievement can be defined as "quality in all academic subjects, in class as well as extracurricular activities. It comprises highest quality in the sporting, behavior, confidence, communication skills, punctuality, assertiveness, arts, culture, and like".

Academic achievement is defined as all types of knowledge and skilled developed in the school subjects which can be judged on the basis of test scores or marks assigned by the teacher on some prescribed criteria (Phye, 1997).

In the present study the researchers felt the need for some innovative methods which are equally useful for intelligent and below average students. Therefore the researchers have tried to check the effect of cooperative learning on the self-concept and academic achievement of male and female students at elementary school level. An experiment was conducted to test the effects of cooperative learning method on the academic achievement and self-concept of the elementary school students. This study will be helpful in bringing change in the behavior of the students. They may cooperate

with each other, not only in the classroom, but in daily life as well. Curriculum planners and developers may use the results of this study as guideline for improving the mathematics course. The findings of the study may also be helpful for teacher trainers.

Objectives of the Study

The main objectives of the study were:

1. To explore the difference between cooperative learning and lecture demonstration method on the academic achievement and self- concept of students at the elementary school level.
2. To examine the gender difference on academic achievement and self- concept.
3. To determine the difference between cooperative learning and lecture demonstration method on self- concept and academic achievement of high and low achievers
4. To see the overall treatment effect on academic achievement and academic self-concepts of low, average and high achievers

Hypotheses of the Study

The following null hypotheses were tested:

$H0_1$: There is no significant difference between cooperative learning and lecture demonstration method on academic achievement score

H02: There is no significant difference between cooperative learning and lecture demonstration method on post-academic self-concept score

Ho3: There is no significant difference in male and female on post academic achievement score of the students

H04: There is no significant difference in male and female on post-academic self-concept score

H05: there is no significant difference between the High and low achievers on academic achievement in cooperative learning and lecture demonstration method

H06: there is no significant difference between the High and low achievers on post-academic self-concept score in cooperative learning and lecture demonstration method

H07: There is no treatment effect on Low, average and High achievers in Control and Experimental groups on post- test scores

H08: There is no treatment effect on Low, average and High achievers in Control and Experimental groups on post- academic self-concept scores

Limitation

There was no standardized instrument for the calculation of self-concept. Therefore self- concept was calculated through the modified and validated Herb-Marsh questionnaire. The study was also limited to self-developed and validated and reliable post-test to find academic achievement of students in Mathematics.

Research Methodology

Experimental research design was used to explore the differences between the variables.

Population

All students studying in private school at the elementary level comprised the population of the study.

Sample

The Nayab English Medium School (private) was selected on a convenient basis for the research. It is a co-education institution. A random sample of 40-students (26 male and 14 female) of class-V were selected from the school. This random selection was made by bowl method. The students' ages were from 11 to 13 years.

Research Instrument

Two research instruments were used in this study. One was the adapted version of the Self-Description Questionnaire–I prepared by Herb Marsh (1992) to measure academic self-concepts of the students. Academic self- concept scale contains 25-items, eighteen were positive and seven represent the negative behavior of the respondent. The original questionnaire was 8-point rating scale consisting of a total 86-item. A modification was made in SDQ-I to use in Pakistan. It was translated into Urdu language for students' understanding. Responses were delimited in 5-point Likert scale. The reliability of the modified versions of the SDQ-I's was checked through test retest method. The reliability coefficient was 0.85. The second instrument was a post-test to find the academic achievement at the end of the experiment. The validity of the post-test was assured through 40 subject experts of mathematics. The face and content judgment was made through the mathematics subject teachers at the elementary school level. The 16% items were deleted as a result of this judgment. Reliability of the post-test was assured through research experts of the Gomal University and it was found to be 0.92.

Procedure of the study

First of all, the whole sample was given a pre-test to divide it into two equated groups. One group was called controlled and the other as experimental. Both the groups were similar except for the method of teaching. The Control group was taught with the help of lecture demonstration method while the experimental group was taught with the cooperative learning method. Both the groups were taught with the same teacher to control the teaching. The treatment of both groups was continued for a period of 52-days. At the end of treatment, both research instruments were distributed among the participants of both groups. Post-test was used to check the academic achievement and SDQ-I was to check the academic self-concept of the students after the treatment.

Analysis of Data

After collecting the data the scores were presented in the data matrix form on SPSS (version 17.0). The data was analyzed in order to test the hypotheses. Descriptive statistics (Mean, Standard deviation) and inferential statistics (t-test and ANNOVA) were used to check the significant mean differences between the two groups at $\alpha = 0.05$ (level of significance).

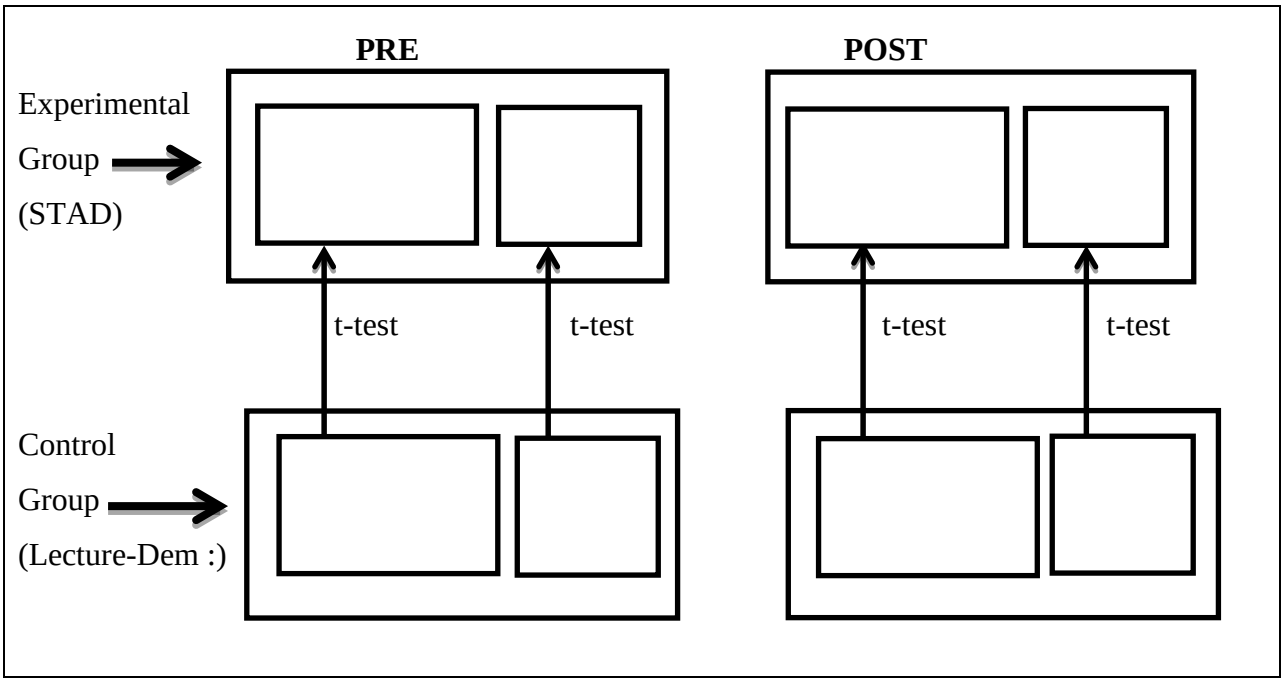


Table 1
Showing t-test on academic achievement (post-test) score of control and experimental groups

	Group	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value
post-test score	CONTROL	20	20.35	4.75	1.062	-.5080	0.017
	EXPRIMENTAL	20	23.50	3.000	.671		

Table 1: shows the post academic achievement scores of Control and Experimental groups at $\alpha = 0.05$. The result shows that $p=0.017 < 0.05$. Therefore, it was concluded that there is a significant difference between the two groups. The Mean score shows that the experimental group preformed significantly better than the control group.

Table 2
Showing t-test on self-concept score of control and experimental groups

	Group	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value
Post-test Scores	CONTROL	20	3.4180	.32560	.07281	3.233	0.003
	EXPRIMENTAL	20	3.7280	.27913	.06241		

Table 3 indicates the post academic self-Concept test scores of Control and Experimental groups at $\alpha = 0.05$. The result shows that $p= 0.003 < 0.05$. Therefore it was concluded that there is a significant difference between the two groups. The Mean score shows that the experimental group preformed significantly better than the control group.

Table 3
Showing t-test on the academic achievement (post-test) score across the gender

	Gender	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value
post-test score	MALE	26	21.31	4.479	.878	-1.267	0.213
	FEMALE	14	23.07	3.605	.963		

Table 2 indicates the post academic achievement scores of Male and Female at $\alpha = 0.05$. The result shows that p= 0.213 > 0.05. Therefore it was concluded that there is a no significant difference between the two groups.

Table 4
Showing t-test on the self-Concept score across the gender

	Gender	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value
Post-test Scores	MALE	26	3.4862	.35176	.06899	-2.338	0.025
	FEMALE	14	3.7343	.24837	.06638		

Table 4 indicates the post academic self-Concept scores of Male and Female at $\alpha = 0.05$. The result shows that p= 0.025 < 0.05. Therefore it was concluded that there is a significant difference between the two groups. The Mean score shows that the female group performed significantly better than the male group.

Table 5
Showing post-test (High Achiever) average scores of control and experimental groups in comparison under controlled and experimental conditions

	Control/Experimental	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value
Post- test (High Achiever)	**Control**	**13**	**23.3846**	**1.55662**	**.43173**	**-1.309**	**0.201**
	Experimental	**17**	**24.3529**	**2.28968**	**.55533**		

Table 5: indicates the post-test (High Achiever) average scores of control and experimental groups in comparison under controlled and experimental conditions was found not significantly different as a P - value greater than the level of significance i.e 0.201 > 0.05. Hence both groups are completely identical.

Table 6
Showing post-test (Low achiever) average scores of Control and Experimental groups in comparison under controlled and experimental conditions.

	Controlled/Experimental	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value

Post-test-(Low achiever)	**Controlled**	**6**	**13.8333**	**2.22860**	**.90982**	**-2.413**	**0.052**
	Experimental	**2**	**18.000**	**1.41421**	**1.00000**		

Table 6: indicates the post-test (Low achiever) average scores of Control and Experimental groups in comparison under controlled and experimental conditions was found not significantly different as a P - value greater than the level of significance i.e 0.052 > 0.05. Hence both groups are completely identical.

Table 7
Showing pre-academic self-Concept (High_ scorer) of Control and Experimental groups in comparison under control and experimental conditions

	Control/Experimental	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value
PRE_ASC_High Scorer	**Controlled**	**3**	**3.4400**	**.00000**	**.00000**	**-3.389**	**0.01**
	Experimental	**7**	**3.4400**	**.00000**	**.00000**		

Table 7: indicates the pre academic self-Concept (High_ scorer) of Control and Experimental groups in comparison under control and experimental conditions was found significantly different as a P - value less than the= 0.05 values i.e. 0.01 < 0.05. Hence both groups are not completely identical.

Table 8
Showing pre-academic self-Concept (Low Scorers) of Control and Experimental groups in comparison under control and experimental conditions

	Control/Experimental	N	Mean	Std. Deviation	Std. Error Mean	t-value	p-value
PRE_ASC(Low Scorers)	**CONTROL**	**18**	**3.1428**	**.07307**	**.01722**	**-0.848**	**0.405**
	Experimental	**13**	**3.1600**	**.00000**	**.00000**		

Table 8: indicates the pre academic self-Concept (Low Scorers) of Control and Experimental groups in comparison under control and experimental conditions was set up not significantly different as a P - value greater than the level of significance i.e. 0.405 > 0.05. Hence both groups are completely identical.

Table 9
Showing ANOVA (2×2) denoting treatment effect on Low, average and High achievers in Control and Experimental groups on post- test scores

S of variation	SS	D_f	M S	F-value	p-value
Intercept	16366.813	1	16366.813	1383.363	.000
GROUP(Cont:/ Exper:)	86.732	1	86.732	7.331	.011
ACHIEVRS	136.905	2	68.453	5.786	.007
GROUP * ACHIEVRS	67.917	2	33.959	2.870	.070
Error	402.260	34	11.831		
Total	19927.000	40			

Table 9: shows that P-values of both groups and achievers are < 0.05, which means that both sources of variation were significant at a given value of level of significance. Graphs given below shows that the different achievers of experimental group perform significantly better than the Control group on post- test scores.

Figure 1 Graph

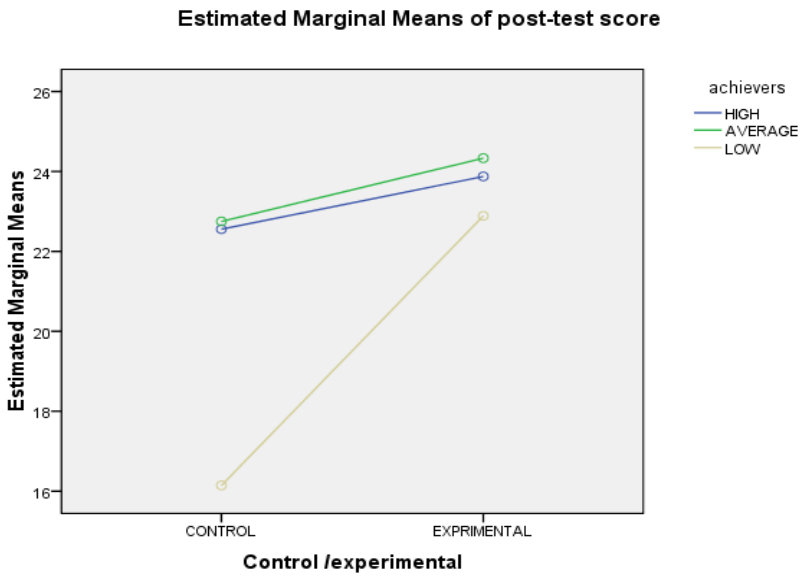
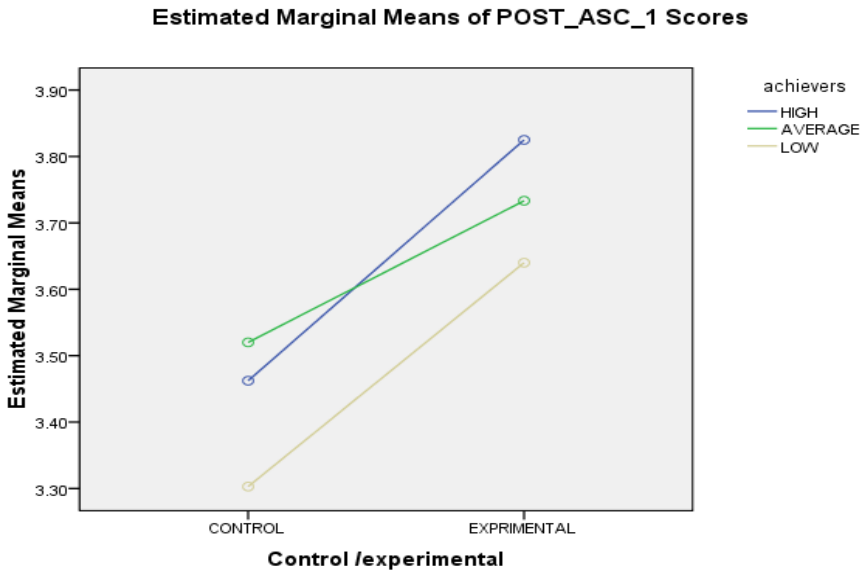


Table 10
Showing ANOVA (2×2) denoting treatment effect on Low, average and High achievers in Control and Experimental group's post- Academic Self-concept scores

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	429.972	1	429.972	4571.928	.000
GROUP	.777	1	.777	8.262	.007
ACHIEVRS	.267	2	.133	1.418	.256
GROUP * ACHIEVRS	.028	2	.014	.149	.862
Error Total	3.198 515.109	34 40	.094		

Table 10: shows that p-values < 0.05 obtained from both sources of variation (Group and Achievers) were significant at given value of level of significance. Graphs given below shows that the different achievers of experimental group perform significantly better than the Control group on post- Academic Self-concept score

Figure2 Graph



Findings

1. The analysis of post academic achievement scores of control and experimental groups at α = 0.05 shows that p=0.017 < 0.05. Therefore, it was concluded that there is a significant difference between the two groups. The Mean score shows that the experimental group

preformed significantly better than the control group (Table 1). Therefore the first null hypothesis 1: stating the significant difference between the two groups is rejected.

2. The analysis of Post academic self-Concept test scores of Control and Experimental groups at $\alpha = 0.05$ shows that $p= 0.003 < 0.05$ (Table 2). Therefore, it was concluded that there is a significant difference between the two groups. The Mean score shows that the experimental group performed significantly better than the control group. Hence the null hypothesis 2 was rejected.
3. The analysis of post academic achievement scores of Male and Female at $\alpha = 0.05$ shows that $p= 0.213 > 0.05$ (Table 3). Therefore it was concluded that there is a no significant difference between the two groups. Therefore the second null hypothesis stating the significant difference between the two groups is accepted.
4. The analysis of Post academic self-Concept scores of Male and Female at $\alpha = 0.05$ shows that $p= 0.025 < 0.05$. (Table 4). Therefore it was concluded that there is a significant difference between the two groups. The Mean score shows that the female group performed significantly better than the male group. Hence the null hypothesis 4 was rejected

5. The analysis of post-test (High Achiever) scores of control and experimental groups in comparison under controlled and experimental conditions shows that $p = 0.201 > 0.05$ which shows that both groups are completely identical (Table 5). Also post-test (Low achiever) scores of Control and Experimental groups under controlled and experimental conditions shows that $p= 0.052 > 0.05$ (Table 6), which means that both the groups are completely identical. Hence the null hypothesis 5 was accepted

6. The analysis of post self-concept (High Achiever) scores of control and experimental groups in comparison under controlled and experimental conditions shows that $p = 0.01 < 0.05$ which shows that there is a significant difference between the two groups (Table 7). Also post academic self-concept (Low achiever) scores of Control and Experimental groups under controlled and experimental conditions shows that $p= 0.405 > 0.05$, which means that there is no significant difference between the two groups (Table 8). Hence the null hypothesis 6 was partially rejected
7. The data analysis for the treatment effect on Low, average and High achievers in Control and Experimental groups on post- test scores shows that p-values of both groups and achievers are < 0.05, which means that both sources of variation were significant at a given value of level of significance (Table 9). Graph in the Figure1 also shows that the different achievers of experimental group perform significantly better than the Control group on post- test.

8. The data analysis for the treatment effect on Low, average and High achievers in Control and Experimental groups on post academic self-concept shows that p-values < 0.05 obtained from both sources of variation (Group and Achievers) was significant at given value of level of significance (Table 10). Graph in Figure2 also shows that the different achievers of experimental group perform significantly better than the Control group on post- Academic Self-concept.

Discussion

The result of the study shows that cooperative learning method was better than the traditional lecture method in the enhancement of academic achievement. These results are supported by Iqbal (2004) who worked on the effect of cooperative learning on academic achievement of secondary school students in mathematics. He concludes that cooperative learning techniques are far-better teaching techniques for the subject of mathematics and other science subjects as compared to traditional teaching methods. The results are also in line with the studies of Zakaria & Iksan (2007) , Brandt & Ellsworth (1996), Zisk, (1998), Sanchez & Roda (2007)

The results of Post academic self-Concept test scores of Control and Experimental groups shows that cooperative learning makes the self-concept better than the traditional lecture method. These results are supported by the studies of Adesoji & Ibraheem (2009), Adeyemi, (2008), Zisk, (1998), and Sanchez & Roda (2007)

Conclusions

Cooperative learning method is better than the lecture method in the enhancement of academic achievement of the students. The Cooperative learning method **is also** better than the lecture method in the development of academic self-concepts of the students

The result of the study reveals shows that across the gender there was no significant difference between the male and female on the academic achievement while there was a significant difference on the self- concept scale and the female performed significantly better than the male group.

For the determination of difference between cooperative learning and lecture demonstration method on self- concept and academic achievement of high and low achievers the result shows that there was no difference on cooperative learning and lecture demonstration method while the analysis of post self-concept (High Achiever) scores of control and experimental shows that there was a significant difference between the two groups while on self-concept (Low achiever) scores of Control and Experimental groups there was no significant difference between the two groups

The results of treatment effect on Low, average and High achievers in Control and Experimental groups shows that the cooperative learning method was better than lecture demonstration method for different types of achievers on academic achievement as well as the academic self-concept

Recommendations

The following recommendations are made in the light of the findings and conclusions.

1. This study shows that cooperative learning is better for Mathematics subject than traditional lecture demonstration method. Therefore, the mathematics teachers must apply cooperative learning the new technique of teaching to enhance the academic achievement and academic self-concept of the students.
2. The result of the study may prove helpful for the curriculum developer because keeping in view the effectiveness of cooperative learning they can make the necessary improvement in curriculum of elementary education
3. The result of the study may change the teaching and training pattern of the teachers training institutions including the RITE (Regional Institute of Teacher Education) colleges where training is imparted to the elementary school teachers
4. The mathematics teacher may be encouraged to apply the cooperative learning technique in their daily teaching in the classroom setting. Mathematics' teachers must receive training in cooperative learning technique for the improvement of their teaching. Training should be practical and includes the basic elements of cooperative learning.
5. The study may be helpful for further researchers in this area

REFERENCES

Artz, A.F.,& Newman,C.M. (1990). Cooperative Learning. *Mathematics Teacher, 83,* 448-449.

Burton, L. (1987) Women and mathematics: are there an interaction? *IOWME Newsletter, 3 (1),*

Cohen, E. G. (1994). *Designing Groupwork Strategies For The Hetrogenious Classroom* (2nd ed.). New York: Teachers College Press.

Coleman, B. (2008). *Successful White Teachers of Black Students: Teaching Across Racial Lines in Urban Middle School Science Classroom.* University of Massachusetts Amhers. Ann Arbor: Proquest Information and learning company.

Fennema, E. and Peterson, P. (1987) Effective teaching for girls and boys: the same or different? In D.C Berliner and B. Rosenshine (eds) *Talks to Teacher* (New York: Random House), 111-128.

Gutbezahl, J. (1995). *How negative expectancies and attitudes undermine females' math confidence and performance: A review of the literature.* Amherst, MA: University of Massachusetts. (ERIC Document Reproduction Service No. ED 380 279)

Hyde J. S (1981) How large are cognitive gender differences ? A meta-analysis using omega 2 and delta. America psychologist, 36 (8): 892-901.

Halpern, D.F. (1992) *Sex difference in cognitive Abilities* (Hillsdale: Lawrence Erlbaum).

Iqbal, M. (2004). Retrieved June 27, 2012, from www.eprint.hec.gov.pk/388/

Jerome Kagan, Segal, J., Havemann, E., Bauam, D., & Dsmith, C. (2009). *Psychology:An Introduction.* Alabama: Wadswort.

Kagan, S. (1990). The structural approach to cooperative learning. *Educational Leadership, 47(4),* 12-15.

Kamran, Q. M. (2012). *A Comparitives Study of the Contribution of Public and Private School in the promotion of education.* M.Ed Thesis, I.E.R Gomal University, Dera Ismail Khan(k.P.K) Pakistan.

Khan.S.A (2012). *The effect of cooerative learning on academic achievement of low achievers in english language* in India. pp. 235-243.

Maccoby, E. and Jaclin, C. (1974) *The psychology of sex difference* (Stanford: Stanford university).

Marsh, H. (1992). *Self Research center*. Retrieved May 12, 2012, from Oxford university Web site: http://www.self.ox.ac.uk/

Mayer, R. E., & Alexander, P. A. (2011). *Handbook of Research on Learning and Instruction.* New York: Routledge press.

Parker, R. (1994). *Small-group cooperative learning in the classroom.* OSSC Bulletin.

Phye, G. d. (1997). *Hand Book of Class Room Assessments Learning, Austment, Achievements.* California: Academic press,Inc525 B street,suite 1900, San Deigo,California92101-4495,USA.

Slavin, R. E. (1995). *Cooperative Learning.Theory,Research and practice* (2nd ed., Vol. 48). USA: Allyon and Bacon.

Taylor, L. (1990) American female and male university professors mathematical attitudes and life histories. In L. Burton (ed.), *Gender and Mathematics: An International perspective (* London: Cassell), 47-59.

Open University (1987) *Girl into mathematics* (Cambridge: Cambridge University Press).

Webb, M. W (1982) Student interaction and learning in small groups. *Review of Educational Research,* 52(3): 421-455.

Woolfolk, A. E. (1989). *Educational Psychology.* New Jersey: Prentice Hall Englewood Cliffs.

Yadav, M. (2001). *Teaching of Science.* New Delhi: Anmol Publications.

Zahra, A. T. (2010). *Relationship Between Self Concepts and Academic Achievement Of female Bachelor Degree Students*. Retrieved 08 17, 2012, from http://eprints.hec.gov.pk/6463/1/520S.htm