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# Comparing Effect Size and Measuring Achievement Gains of Cooperative and Traditional Methods in Pakistan Studies

***Alyas Qadeer Tahir****

***Abstract***

*Cooperative learning, due to its influential aspects, is the most prevalent teaching-learning technique in the modern world. In view of its effectiveness, an experimental study was conducted in order to compare and see the learning outcomes of twelfth grade students (n=100) taught by cooperative learning versus traditional methods of teaching in the subject of Pakistan Studies. Three psychological measures self-esteem, motivational level and social self-efficacy were also taken into accounts for which separate scales were developed. A pretest posttest equivalent groups design was used for the experiment. The students were exposed to eight weeks treatment comprising fifteen lessons of Pakistan Studies. Data was analyzed using t-test, calculating effect size and displaying percentile point gains over normal curves. The results of this study show that the experimental group outscored on academic achievement as compared to the control group exhibiting on the whole, cooperative learning is more effective teaching-learning technique for the subject of Pakistan Studies as compared to traditional (competitive and individualistic) methods of teaching. The experimental groups show superiority in self-esteem, motivational level and social self-efficacy over control group on post-test. The, average learners show positive gains surprisingly than high and low achievers in academic achievement, self-esteem and motivational level on posttest as compared to students in the control group. The results of this study provide advocacy for the application of cooperative learning in the Pakistan Studies classroom as well as further research in cooperative learning within other subject areas in different situations.*

* Dr. Alyas Qadeer Tahir is Director, National Institute of Science and Technical Education, Ministry of Education, Islamabad.

**Introduction**

Social Studies are integrated study of social sciences and humanities to promote civic competencies. These studies aim to adjust the students to their social environment. It is a collective name of history, civics, geography, economics and sociology etc. selected for instruction in schools and colleges. In Pakistan, instead a unified subject with the name of Pakistan Studies is taught from Grade 9-14 as compulsory subject covering all aspects of Social Studies. Therefore, the subject of Pakistan Studies is anonymous to Social Studies and has built in aspects of social, cultural, historic and geographical phenomena related to Pakistan and its regions around. Wesley[1] sometimes referred to as 'the father of Social Studies' remarked in Medison Conference in 1892 that 'teaching of history, government and economics is the first step in the development of Social Studies'. According to Social Studies Committee of School Board, as quoted by Singh 'what we study in Social Study is the life of man in particular place at some particular time'.[2]

The main purpose of teaching Pakistan Studies at college level is to expose students with ideology, surroundings, geography, environment and social values of people of Pakistan. According to Azhar, 'Pakistan Studies is playing an important role in developing patriotism, integrity and enlightenment among youngest of Pakistan'.[3] The traditional view of communicating information in Pakistan Studies classrooms is periodical when one thinks of the way that the material, facts and processes are determined. Traditional teaching is concerned with the teacher being controller of the learning environment.[4] The diverse subject like Pakistan Studies demands teacher to encourage their students using 'high skills to construct their own knowledge about the subject's concepts and relate classroom lesson to their lives and experiences'.[5] The instructors of Pakistan Studies need to use a variety of methods and strategies to assist students to achieve the learning goals as optimistically as possible. Among many techniques, the cooperative learning can be one of the suitable techniques in teaching of Pakistan Studies.

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1 E.B. Wesley, *Teaching Social Studies in High Schools.* 3rd ed. (Boston: D.C. 1950) Retrieved from http://wik.ed.uiuc.edu/index.php/Social_Stuies.

2 Y.K Singh, *Teaching of Social Studies* (New Delhi: APH Publishing Cooperation, 2004), pp.2-27, 52-94.

3 Hameed Azhar, *Scope and Instructions of Pakistan Studies* (unpublished), Middle School Project, Ministry of Education, Islamabad, Pakistan, 2000.

4 J. Dewey, *Experiences and Nature* (New York: Dovers Books, 1929).

5 M.L. Rice and E.K. Wilson, 'How technology aids constructivism in the social studies classroom', 999 Retrieved from http://global.umi.com/pqdweb.

Cooperative learning is a modern and popular instructional paradigm. But it is less researched and practiced in southeast Asian countries, especially in Pakistani educational set up. In view of this it was needed to see the practical ability of cooperative learning in Pakistani colleges. According to Salvin, 'there are a number of methods of cooperative learning, out of which the Students Team-Achievement Division (STAD) method is the most effective method'.[6] Therefore, STAD was used to study its effectiveness on teaching of Pakistan Studies. This study was conducted to compare and see the effects of the learning outcomes of the students of 12th grade in the subject of Pakistan Studies taught by traditional versus cooperative learning technique. The study was also focused on the comparison of self esteem, motivational level and social self-efficacy of the high, average and low achievers of control and experimental groups taught by cooperative learning techniques versus traditional style of chalk and talk method of teaching Pakistan Studies in Pakistan.

**Review of literature**

The subject of Pakistan Studies was introduced as compulsory subject at intermediate level (Grade 11-12) from year 1981 in Pakistan. The weightage of this subject in the curriculum scheme of studies is 4.5 per cent. The students of intermediate have to take an examination of 50 marks as part of requirement of Scheme of Studies of Higher Secondary School.[7] Historically, Social Studies was nurtured by the work of John Dewey[8] and promoted by prominent educators such as George Counts, Edger Wesley, Harold Ruggy and Iarle Rugg. In 1921, an organization of the National Council for Social Studies was founded by a small group of Professors concerned with teacher education.[9] Wesley wrote that 'economics, sociology and civics were called Social Studies as early as 1905'.[10] He was referring to the earlier curriculum specially labeled as 'Social Studies' and intended for citizenship education, 'The Social Studies is the Hampton curriculum'. This curriculum, taught at the Hampton Normal and Agricultural Institute in Hampton, Virginia, was

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6 R.E. Slavin, *Cooperative Learning, Theory Research and Practice,* Allyn and Bacon, 1995, pp.4-8.

7 Ministry of Education, *Scheme of Studies for HSSC* Islamabad, 2000.

8 J. Dewey, *op.cit.*

9 J. Singh, *Teaching of Social Studies at Schools,* Shanti Nagar, India, 2005, p.230.

10 E.B. Wesley, *op.cit.,*

created in 1905 by a Columbia University educationist and sociologist, Thomas Jesse Jones.

Teaching methods too have a long history which relates to the questions, 'what is the purpose of education' and 'what are the best ways of achieving these purposes'. For much of human history, educational methods consisted of students initiating on modeling their behaviour on that of their elders, learning through observation and play. A competent teacher applies broad, deep and integrated set of knowledge and skills, plan for implemention and revises instruction.[11] Cooperative learning is a body of literature and research that has examined the effect of cooperation in education. It offers ways to organize group work to enhance learning and increase academic achievement. According to Webster Encyclopedia 'cooperation is an act of instance of working or acting together for a common purpose of benefit'.[12] Cowie said that 'cooperation is acting or working together for a common purpose'.[13] Artz & Newman defined cooperative learning as 'the small group of learners working together as a team to solve a problem, complete a task or accomplish a common goal'.[14] The theoretical roots of cooperative learning lie deep in learning theories. Johnson and Johnson[15] have described learning on motivational perspectives, social cohesion perspectives, cognitive perspectives, development perspectives and cognitive elaboration perspectives.

There are some psychological benefits of cooperative learning such as self-esteem, social self-efficacy and improvement in motivational level. According to Brandon, 'Self-esteem is an intimate experience; it resides in the core of ones being. It is what I think and feel about myself not what someone else thinks or feels about me'.[16] An important benefit of cooperative learning is that it enhances student's self esteem which in turn motivates students to participate in the learning process.[17]

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11 Majidul Hassan Siddique, *Technology in Teacher Education* (New Delhi: Publishing Cooperation 2004), p.147.

12 *Webster Encyclopedia,* New York, 1989, p. 321.

13 P.A. Cowie, *Oxford Advanced Learner Dictionary of Current English.* 4th ed., Oxford University, 1989, p.261.

14 A.F. Artz and C. M. Newman, *Cooperative Learning for Mathematics Teachers,* 1990, pp.448-49.

15 D.W. Johnson, and R.T. Johnson, *Learning Together and Alone: Cooperative, Competitive and Individualistic Learning,* Allyn and Bacon, 1999, pp.69-89, 183-217.

16 N. Brandon, *The Six Pillars of Self Esteem* (New York: Bantam Publishing Co, 1994).

17 D.W. Johnson, and R. T. Johnson, *op.cit.*

Cooperative efforts among students result in a higher degree of accomplishment by all participants.[18] Self-efficacy is an impression that one is capable of performing in a certain manner or attaining certain goals. Bandura points out that 'experience, modeling, social persuasion and physiological factors effect the self efficacy'.[19] The term motivation refers to an internal state that activates and gives direction to our thoughts.[20] According to Arends 'motivational behaviour is energized, directed and sustained'.[21]

The researchers have analyzed the effectiveness of cooperative learning with respect to academic achievement, social adjustment and psychological health. Most of the research findings in cooperative learning belong to USA, Israel, Germany, Japan, UK, Australia and some countries of Africa and Asia. In meta-analyses of all the studies that had been completed in the area of social interdependence and achievement, Johnson et al[22] reviewed 12 studies conducted between 1942 and 1981 that yielded 286 findings. The three methods of meta-analysis used were voting method, effect size method, and z-score method. The result indicated that cooperative learning experiences tended to promote higher achievement than did competitive and individualistic learning experiences. The average person working within a cooperative learning situation achieved 80$^{th}$ percentile of the students working within a competitive or individualistic situation. Slavin[23] examined several ninety-nine studies that lasted for four or more weeks and used a variety of cooperative learning methods. Sixty-three per cent of the ninety-nine experimental-control comparison favored cooperative learning. Only five per cent significantly favoured the control group. Overall, students in cooperative learning group scored about one-fourth of a standard

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18 R.E. Slavin, *Cooperative Learning, Theory Research and Practice,* Allyn and Bacon, 1995, pp.4-8.

19 A. Bandura, 'Social Cognitive Theory: An Agnetic Perspective,' *Annual Review of Psychology*, 52:2001, pp. 1-26; B.B. Lahey, *Psychology, An Introduction*, 8$^{th}$ ed., (New York: McGraw-Hill Companies 2004), pp. 368-73.

20 *Ibid.*,

21 R.I. Arends, *Psychology: An Introduction* (New York: McGraw-Hill Companies, 2001), pp.256-404.

22 R.T. Johnson, G. Maruyama, D. Nelson, and L. Skon, 'Effect of Cooperative, Competitive and Individualistic Goal Structures on Achievement: A Meta-analysis,' *Psychological Bulletin*, 104:1981, pp.207-16.

23 R.E. Slavin, *op.cit.,* pp.4-8.

deviation higher on achievement test than did students taught conventionally.

Researchers have also assessed the impact of cooperative learning on problem solving. After reviewing forty-six studies Qin et al[24] concluded that students of all age levels (elementary, secondary, college and adult) who worked cooperatively outscored students who worked competitively. The average student in a cooperative group solved more problems correctly than 71% of the students who worked competitively. Singhanayok and Hooper[25] found that cooperative learning groups spent more time engaged in the task, checked their concept, learning more and scored higher on posttest than students working individually. Kewley conducted 'Peer collaboration encourages maximum students participation at the idea level, resulting in more flexible thinking multiple solutions, and a clearer understanding of the steps leading up to those solutions'.[26]

Slavin[27] discovered that gifted students gained just as much from cooperative groups as average or low achieving students in all areas except language mechanics. Slavin cited in k-12 setting where he examined the effects of cooperative learning groups on students at different achievement levels and concluded that most studies 'found equal benefits for high, average, and low achievers'.[28] However, Grudnitski and others[29] reported low achieving undergraduate business benefited the most from cooperative learning. Additionally, Kenneth and Young[30] investigated the effects of cooperative learning groups on the

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24 Z. Qin, D.W. Johnson and R.T. Johnson, *Cooperative versus Competitive Efforts and Problem Solving. Review of Educational Research,* 65:2 (1995), pp.129-43.

25 C. Singhanayok and S. Hooper, 'The effect of cooperative learning and learner control on students' achievement, option selection and attitudes,' *Education, Technology, Research and Development* 46:2 (1998), pp.17-25.

26 L. Kewley, 'Peer collaboration versus teacher-directed instruction: How two methodologies engage students in the learning process,' *Journal of Research in Childhood Education,* 13:1 (1998), pp.27-32.

27 R.E. Slavin, 'Research on Cooperative Learning and Achievement: What we know and what we need to know,' *Contemporary Educational Psychology,* 2:1 (1996), p.469.

28 *Ibid.,*

29 Grudnitski, Gary, Hampton & R. David, 'Does cooperative learning mean equal learning?' *Journal of Education for Business*, 72, 1996, pp.5-8.

30 D.j. Kenneth, and A.M. Young, 'Is cooperative learning effective for high achieving entrance students? Implication for policy and teaching resource,'. *Journal of Research and Development in Education,* 33, 1999, pp.27-35.

academic achievement of high achieving pre-service teachers and noted that cooperative learning did not enhance their academic performance. Elaine,[31] conducted a research into the effects of cooperative learning on academic performance which has produced conflicting results. Eighty-nine 5th and 6th grade students were assigned randomly to one of four conditions in a 2 (incentive) by 2 (cohesiveness) factorial designs. Results indicated that students who received rewards based on their individual contributions to an overall group product outperformed those who received rewards based on an overall group product alone. Students in the former condition also made significantly greater pre-post increases on a socio-metric scale. In contrast, students who worked in groups that were high in social cohesiveness performed marginally worse than those who worked in low cohesive groups.

Although cooperative learning is being used as a mode to accelerate in few leading universities of Pakistan such as LUMS and NUST but there is no cult to compile and compare with some other teaching-learning techniques. At low levels, perhaps cooperative learning is least applied and therefore there appear a few studies in this field. Arbab[32] conducted a research to probe into the effects of cooperative learning on general science achievement of the 9th grade students. In the experiment of two weeks duration, he found on the basis of pre-test and post-test scores that cooperative learning had more positive effects on student general science achievement as compared to usual methods of teaching. Kohsar[33] investigated the effects of cooperative learning on social studies achievement among 7th grade students. The sample comprised 40 students of 7th grade, equally placed in experimental and control groups on the basis of scores obtained in the Social Studies annual examination. In this experiment of two weeks, cooperative learning resulted in higher achievement as compared to routine methods of Social Studies. Parveen[34] conducted an experimental study on the

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31 C. Elaine, *Incentives on Small Effects of Social Cohesiveness and Cooperative Group Outcomes.* Vol. 7, The University of Sydney, 2002.

32 S. Arbab, *Effect of Cooperative Learning on the General Science Achievement of 9th Class Students.* Unpublished Master level Thesis. PAF College of Education for Women, Chaklala, Rawalpindi, 2003, p.95.

33 R. Kohsar, *An Experimental Study on Effects of Cooperative Learning on Social Studies Achievement among 7th Class Students,* Master level unpublished thesis. PAF College of Education for Women, Chaklala Rawalpindi, 2003, p.81.

34 Q. Parveen, *An Experimental Study on Effects of Cooperative Learning on Social Studies Achievement among 8th Class Students,* Master level

effects of cooperative learning on Social Studies achievement among 8th grade students. The study sample consisted of 35 students who are among experimental group (N-18) and control group (N-17), matched on the basis of their annual examination Social Studies scores. After a treatment of 15 days duration, on the basis of pretest and posttest scores, cooperative learning was not found to be a better instructional strategy than routine methods of teaching. Iqbal[35] conducted an experimental study on the effects of cooperative learning on academic achievement of 10th class students in the subject of mathematics. The study sample consisted of 53 students, 25 in control group and 28 in experimental group on the basis of pretest scores in the subject of mathematics. The experiment lasted for eight weeks. On the basis of posttests cores, it was noticed that cooperative learning proved more affective teaching strategy as compared to traditional (competitive and individualistic) methods of teaching. Further more, cooperative learning appeared to be more favorable for low achievers than high achievers.

**Research methodology**

The present study was experimental and aimed at comparison of learning outcome in terms of academic achievement, self-esteem, motivational level and social self-efficacy of the twelfth grade students taught by comparative learning technique versus traditional methods of teaching the subject of Pakistan Studies. The pretest-posttest equivalent group design was selected for the study considering best to control the intervening variables. One hundred students of intermediate (twelfth grade) of an Islamabad College were selected for the experiment of the studies. Non-probability sampling technique was used for placing students in each of 50 groups of control and experiment.

**Research instrument**

Due to non-availability of standardized instruments of Pakistan Studies at intermediate level, a teacher made pretest was used for the study. The same test was used as posttest after eight weeks experiment. Alongwith this, three other scales were developed to measure the self esteem, motivational level and social self-efficacy of the students. Two scales

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unpublished thesis. PAF College of Education for Women, Chaklala Rawalpindi, 2003, p.105.

35 M. Iqbal, *Effect of Cooperative Learning* on the *Academic Achievement of Secondary School Students in Mathematics*, PhD level unpublished thesis. University Institute of Education and Research, University of Arid Agriculture, Rawalpindi, 2004, pp.37-75.

self-esteem and motivational level consisted of thirty (30) statements each, while scale of social self-efficacy consisted of twenty (20) statements with five points scale viz; strongly agree, agree, uncertain, disagree, strongly disagree. All the instruments were translated into national language Urdu by using back translation methods. All the instruments were validated by a committee of experts. The split-half methods (odd-even) were used to test the reliability of pretest score obtained by the hundred students of control and experimental groups in academic achievement test. The co-efficient of reliability was determined through using persons product movement formula for co-efficient of co-relation. Estimated co-efficient of reliability from the comparable halves of the pretest was found to be 0.74.

**Data collection**

The sample was divided into two equivalent groups on the basis of scores obtained in the teacher-made academic achievement test. Students taken as a sample of the study Section A (N=50), served as control group while section B (N=50) as experiment group. A treatment of planned fifteen (15) lessons covering first four chapters of Pakistan Studies textbook for intermediate using STAD technique was provided to the experimental group, while the control group was taught same learning material by using traditional (competitive and individualistic) methods for a period of eight (8) weeks. Three other scales i.e. self-esteem scale, motivational level scale and social self-efficacy scale were also administered to the control and experimental groups before and after the treatment. At the end of the treatment, the teacher-made achievement posttest was administered to compare the academic achievement of students of both groups. To compare the effect of cooperative learning on the academic achievement of students and other three psychological measures, the t-test, effect size (by using Glass Delta formulae) and percentile point gain were used as statistical tools of high, average and low achievers of experimental and control groups.

**Analysis of results**

Two samples assuming equal variances t-test (two-tailed) were conducted to compare the achievement score and three psychological scales on posttest to control and experimental groups. The calculations of effect size and percentile point gains give interested results in each of the category. The t-test show that there was a significant difference in achievement scores of posttest for control (M=48.78, SD=13.87) and experimental (M=59.44, SD=13.24) groups, t (98) = 3.2, p= .001. The effect size (ES) expressed the increase in achievement of the

experimental group in standard deviation units. Transferring effect size percentile gains through statistical conversion showed an effect size of .78 representing a percentile gain of about 28 point. However, this gain is equal (46% each) in high and average achievers but less (41%) in low achievers. The shaded area in Figure 1 represents gain in experimental

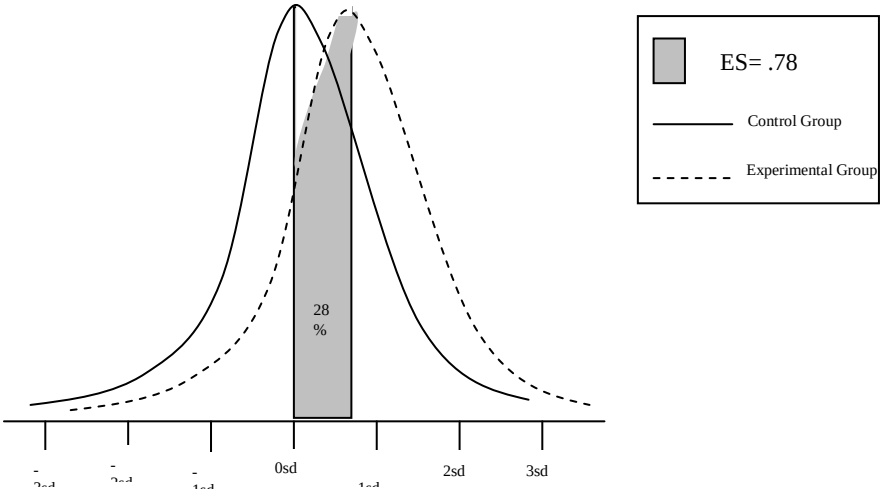


*Figure 1: Effect Size for academic achievement on posttest*

group (28%). The posttest result of self esteem show that there was a significant difference in scores for control (M=63.38, SD=9.91) and experimental (M=69.60, SD=8.63) groups, t (98) = 3.1, p= .001. The effect size expressed the increase in achievement of the experimental group in standard deviation units. Transferring effect size percentile gains through statistical conversion showed an effect size of .66 representing a percentile gain of about 25 point. This gain is more (48%) in average achievers as compared to high (34%) and low (27%) achievers. The shaded area in Figure 2 represents gain in experimental group (25%). The comparison of motivational level of students on posttest show that there was a significant difference in scores for control (M=67.26, SD=10.76) and experimental (M=71.30, SD=6.53) groups, t (98) = 2.7, p= .006. The effect size expressed the increase in achievement of the experimental group in standard deviation units. Transferring effect size percentile gains through statistical conversion

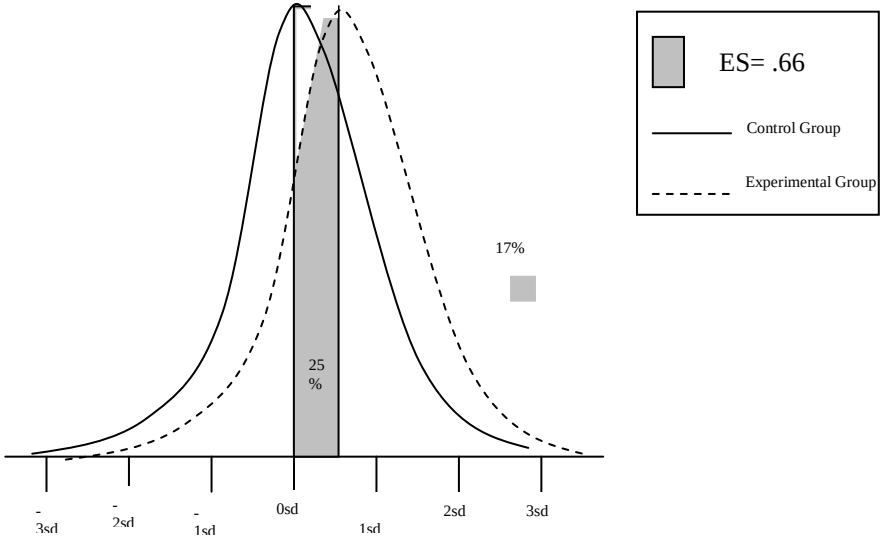


*Figure 2: Effect Size for self-esteem on posttest*

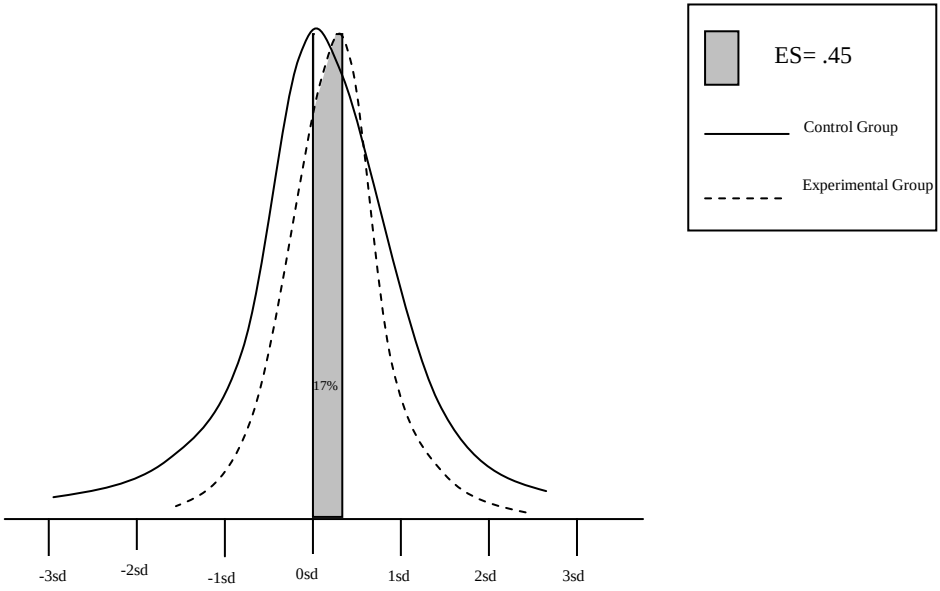


*Figure 3: Effect Size for motivational level on posttest*

showed an effect size of .45 representing a percentile gain of about 17 point. Again, this gain is more (48%) in average as compared to high (46%) and low (23%) achievers. The shaded area in Figure 3 represents gain in experimental group (17%). The posttest result of social self-efficacy show that there was a significant difference in scores for control (M=66.80, SD=9.42) and experimental (M=73.94, SD=10.25) groups, t (98) = 3.5, p= .000. The effect size expressed the increase in achievement of the experimental group in standard deviation units. Transferring effect size percentile gains through statistical conversion showed an effect size of .72 representing a percentile gain of about 26 point. However, this gain is more (48%) in high as compared to average (43%) and low (36%) achievers. The shaded area in Figure 4 represents gain in experimental group (26%).

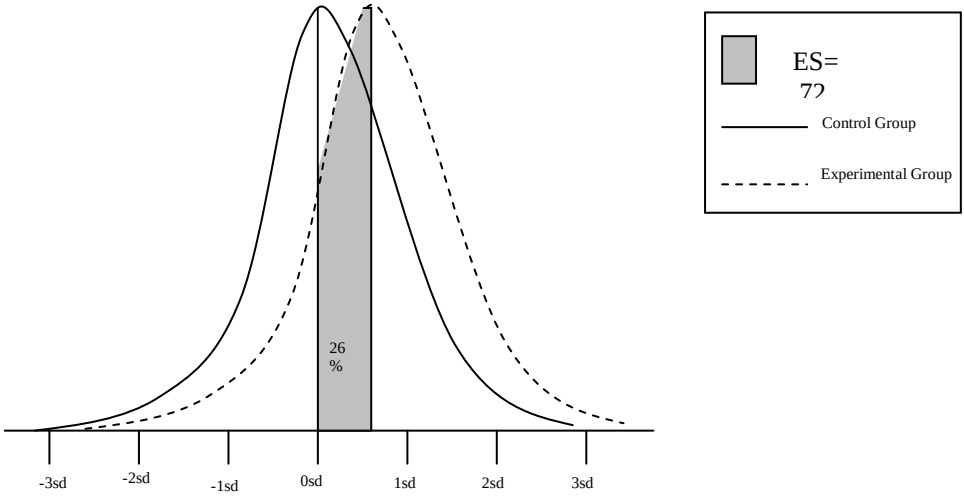


*Figure 4: Effect Size for social self- efficacy on posttest*

**Conclusion and discussion**

In this study, there found to be a significant difference and gain in posttest in terms of academic achievement, self esteem, motivational level and social self-efficacy but surprisingly the average students of experimental group appeared to be more beneficiary than high and low achievers. Whereas, there is a general agreement in most of the researchers that low achievers and high achievers benefited more than

average students through cooperative learning. Slavin[36] examined the effects of cooperative learning technique on students of K-12 at different achievement levels and concluded that most studies found equal benefits for low, average and high achievers. In a study conducted by Iqbal,[37] it was found that cooperative learning proved as more effective teaching strategy as compared to the traditional one in teaching of mathematics. The low achievers proved to be more beneficial than the high achievers in the study. Kohsar[38] conducted a study and found that cooperative learning resulted in higher achievement as compared to routine methods of Social Studies. The results of some studies showed that cooperative learning is more beneficial for low achievers as compared to average and high achievers. Kemneth and Young and Grundnitski & Hoompton[39] reported that cooperative learning is more favorable for low achievers. It can be safely speculated that difference in terms of less or more gain through cooperative learning in three levels of achievers rest upon the variation in variables likewise classroom setting, training and experience of college teachers, student's socio-economic background and attitudinal values of a society. There have been only a few studies conducted on cooperative learning in Pakistan. These studies provide insufficient results about the maximum use of cooperative learning in Pakistani culture. It is recommended that a series of action researches in different subjects on various methods of cooperative learning in different situations likewise urban, rural, male and female and mixed gender at school, college and university levels be carried out for obtaining results and creating suitable situations.

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36 R.E. Slavin, 'Research on Cooperative Learning and Achievement: What we know and what we need to know,' *Contemporary Educational Psychology*, 2:1 (1996), p.469.

37 M. Iqbal, *op.cit.*

38 R. Kohsar, *An Experimental Study on Effects of Cooperative Learning on Social Studies Achievement among 7th Class Students*, Master level unpublished thesis. PAF College of Education for Women, Chaklala Rawalpindi, 2003, p.81.

39 Grudnitski, Gary, Hampton & R. David, *op.cit.*
D.j. Kenneth, and A.M. Young, *op.cit.*, pp.27-35.