



An Experimental Study on the Effect of Cooperative Learning on Students' Academic Achievement and Students' Perceptions towards Cooperative Learning

Qaisara Parveen^{1*}, M. Imran Yousuf² and Saima Mustafa³

*Division of Continuing Education and Department of Mathematics, PMAS-Arid,
Arid Agriculture University, Rawalpindi, Pakistan*

E-mail: ¹<qaisarach@yahoo.com>, ²<dr.imran@uaar.edu.pk>, ³<saimamustafa28@gmail.com>

KEYWORDS Achievement. Elementary. Independent variables. Mathematics. Students' Perceptions

ABSTRACT The present study was anticipated to explore the impact of cooperative learning on students' speculative achievement at elementary level, inside the classroom environment. The principle target was to examine the scholarly accomplishment of an exploratory group with that of a control group. The control group was indicated using traditional strategies while the trial social event was instructed through cooperative learning. The framework of the study used a pre-test and post-test control amass, that is a type of a true experimental design. The students' academic achievement in the mathematics was the reliant variable and techniques for educating were the independent variables. The number of inhabitants in the study contained all the seventh grade understudies contemplating in the Government Girls High School, situated in Rawalpindi in Pakistan. The sample included 30 seventh grade understudies, selected randomly from the government school of Rawalpindi. The selected sample students were distributed into one control group and one experimental group on the basis of their pre-test scores. The information was broken down by applying a t-test at a .05 level of hugeness. It was induced that understudies taught through cooperative learning showed better results for their scholastic accomplishment on the post-test than those instructed through traditional techniques.

INTRODUCTION

Cooperative learning was moderately obscure and to a great extent disregarded by instructors in the mid of 1960s, focused and individualistic learning was ruled in basic, optional even in college educating. While competition commanded instructive thought had been working in the public eye, it was to be considered tested by individualistic discovering that depended on Skinner's work on customized learning and behavioral change. In any case, instructive practices and thought have been changed with the progression of time (Johnnson and Johnson 2008). In the right on time of 1970s specialists have been begun their exploration on collective learning (Dillenbourg et al. 1996). One imperative part of Vygotsky's socio hypothesis is the "Zone of Proximal Development", which contends that an understudy cannot see new thought or idea unless he or she gains assistance from an instructor or a companion (Vygotsky 1978). Vygotsky's contends that peer association can help understudies in critical thinking.

Prince (2004) expressed that the communitarian learning is a showing technique where understudies cooperate in little gatherings to seek

after a shared objective. The refinement between communitarian knowledge and cooperative learning emphasis on understudy cooperation's as opposed learning as an individual. Agreeable learning alludes to understudies who work in groups on a task or extend and that every individual from group is answerable for the fulfillment of a task or venture (Mabrouk 2007). Another vital trademark is that in a task like addresses, classes, labs, or undertaking that can be given to the understudies under co-agent learning technique. The aim of the study was to discover the viability of the customary learning and co-agent learning techniques on understudies of nursing, correspondence ability with patients. The study was experimental in nature. The specimen included 34 nursing understudies who were in second semester of the project. The understudies were arbitrarily partitioned into two gatherings-a control gathering that was instructed through customary learning strategy and an exploratory gathering, that was educated the substance through helpful learning techniques. It was reasoned that helpful learning is a successful strategy for enhancing and expanding interchanges aptitudes of nursing understudies particularly in intelligent abilities and follow up the

issue sub scale (Baghcheghi et al. 2011). Kristinam (1997) explored the impacts of agreeable learning on understudies' state of mind and achievement in the subject of arithmetic at auxiliary level. In this study, two pre-calculus were thought about—one class were examined through agreeable learning and alternate class considered the material freely, and an inquiry was directed to the exploratory gathering after the study was finished to survey their dispositions toward the helpful learning strategy. The after effect of the study showed that there is critical distinction in the performance of two gatherings. It was inferred that study comes about demonstrated positive reactions toward the helpful learning. Huiping (2013) investigated the effect of agreeable learning on the advancement of social aptitudes in English as an outside dialect for tertiary understudies. Discoveries recommend generous contrasts for agreeable learning in the change of understudies, general social aptitudes, and specifically in the abilities of equivalent interests and accountability. Sevgi and Ali (2012) found that exploratory gathering felt that collaboration helped them to learn, and they are fulfilled yet they whined about the measure of time challenges of gathering work and commotion amid the sessions. It was presumed that the effect of helpful learning system in PBL and found no contrasts between two strategies of instructing. Iqbal (2004) contrasted helpful learning strategy and the conventional learning technique for the subject of science, and found that the previous is more viable as a showing learning aptitude. Rather than Iqbal (2004), Praveen (2011), Sevig and Ali (2012) found that agreeable learning was very little superior to anything that is a routine technique for educating. In any case, Praveen (2012) upheld Iqbal (2004) that helpful learning was all the more better strategy for instructing for General Science. Haidari et al. (2013) bolstered that co-agent learning is a sure stride towards instructing and learning and in the wake of receiving this philosophy compelling, instructive arrangement in Afghanistan will turn out to be all the more effective in the future.

With the above discourse on cooperative learning strategy for educating, it is extremely needful to examine whether this technique is more powerful to teach the understudies. In this way, the present research was directed to explore the impact of cooperative learning on the understudies' accomplishments at the elementary level.

Objectives of the Study

1. To expose the control group to traditional teaching and the experimental group to cooperative learning.
2. After the experiment quantify the mathematics accomplishment of experimental and control group.
3. To compare the effectiveness of cooperative learning and traditional method of teaching on academic achievement of 7th grade students in the subject of mathematics.
4. To gather the perspectives of the students about their attitudes toward cooperative learning.

Hypotheses of the Study

Following were kept as null hypotheses for the study.

Ho₁: There is no significant difference in the pretest scores of control group and the mean achievement scores of experimental group.

Ho₂: There is no significant difference between the mean achievement scores of pretest and that of posttest of experimental group.

Ho₃: There is no significant difference between the mean achievement scores of pretest and that of posttest of control group.

Ho₄: There is no significant difference between the mean gain in achievement scores of the experimental group and that of control group.

Ho₅: There is no significant difference in the mean achievement scores of experimental group and that of control group on their posttest scores.

METHODOLOGY

Population

The target population of present study comprised seventh grade arithmetic classes (133 understudies) from an urban school partook in two showing units amid a system of helpful learning (Unit 2: decimals; Unit 3 fractions). Students had no related knowledge working in cooperative groups.

Sample

Participants included 30 students, who were chosen on the basis of their willingness, who

need to take part intentional in the examination. Members were partitioned into two gatherings on the premise of their pretest scores through coordinating—one group named as exploratory gathering and second named as control gathering.

Instruments

An Accomplishment Test

An accomplishment test was intended to quantify the understudies' accomplishment on science calculation and thinking. This test comprised of 20 things. The past information was investigated through five things and the substance instructed amid the study, was given seventy-five percent weightage in the test. Generally speaking, five things tried earlier information and 15 things tried new learning. After the development, test was approved through the master conclusion understood analysts and subject authorities. After the last endorsement, the instrument was utilized with certain alteration for estimation purposes.

Open-ended Questions

The students' collaboration fulfillment scale comprised of three open-ended inquiries that are connected with the understudies' recognitions towards helpful learning environment and proposal on essential components. These were:

1. Did you like or aversion working agreeably as a gathering? Why or why not?
2. Do you think you would have adapted more in this class in the event that you had done your task alone? Why or why not?
3. In your feeling, what components ought to be kept in an effective helpful setting?

Training of the Students

The preparation programs just spotlights on giving and getting help, the preparation exercises were intended to help the understudies work helpfully amid the examination.

Interventions of the Study

Lesson arrangements, worksheets and tests were intended for instructing the trial bunch through helpful learning. The focuses secured in the lesson joined those, which were to be told

to the class according to their own particular study program. "Pretest Posttest Control Group Design" (Gay 2000) was utilized as a part of the study. This is genuine trial outline controls numerous variables affecting its outside and interior legitimacy. The principal was reached and she permitted the conduction of examination. Subject instructors for mathematics were drawn closer through key for directing the analysis amid approaching days. It was additionally chosen that the exploratory gathering should be instructed by the co-author herself and control bunch by the mathematics instructor of the class concerned. From the next day onwards, the analysis began. Instructing through customary educating was masterminded in a common classroom for the control bunch while an uncommon orchestrated classroom was utilized for educating to the exploratory gathering through helpful learning, while giving treatment to the trial bunch amid one period consistently, it was guaranteed that most recent 15 minutes of period were accommodated guided practice through worksheet. The accomplishment of the group is to guarantee that all individuals from group have learned, and their exercises accentuation on disclosing ideas to each other and urging each other to accomplish (Slavin 1995).

Helped the understudies in climax of worksheets as and when they asked for offer assistance. The latest five minutes were given to get together the worksheets from the class. A similar procedure was followed after for teaching diverse focuses decided for the examination. The treatment time of the study took six days. After summit of treatment, similar accomplishment test in science that was used as pretest was used as posttest.

Ten minutes were given to amass the worksheets from the class. A similar system was taken after for educating diverse topics decided for the test. The treatment time of the study took six days. After fulfillment of treatment, similar accomplishment test in science that was used as pretest was used as posttest. The posttest was held under the near conditions as pretest, particularly the classroom and timing of the test. The posttest was separate according to the key.

Presentation and Analysis of Data

In this part of the study, data is analyzed and interpreted.

Table 1 shows that mean score of post-test was 23.39 for exploratory gathering while the mean score of post-test is 19.24 for control bunch. The scattering of score of trial gathering around its mean was 9.53 and that of the control bunch around its mean was 8.16.

Table 1: Mean and standard deviation for both the experimental and control group

Group	N	Mean	SD
Experimental	15	23.39	9.53
Control	15	19.24	8.16

Table 2 demonstrates that mean pretest score (6.17) expanded to 23.39 after the treatment. Be that as it may, singular contrasts among the trial bunch in light of the fact that very high after treatment.

Table 2: Experimental group: Mean score of the pre-test and post-test

Test	N	Mean	SD
Pretest	15	6.17	3.35
Posttest	15	23.39	9.53

Table 3 uncovers that mean score of pretest score was 6.33 for the control bunch, which expanded to 19.24 in the posttest. Singular contrasts in posttest execution were more prominent than individual varieties in pretest.

Table 3: Control group: Mean score of pre-test and post-test

Test	N	Mean	SD
Pretest	15	6.33	3.60
Posttest	15	19.24	8.16

Table 4: Experimental group and control group: Significance level of difference between their mean score of pre-test

Group	N	Mean	Dif	SE	t	t.05	P
Exp	15	6.17	.16	2.31	0.251	1.69	n s
Control	15	6.33					

Table 5: Experimental group: Significance level of difference between mean pre-test and post-test

Test	N	Mean	SD	SE	t	t.05	P
Pretest	15	6.17	3.35	2.42	7.43	1.69	s
Posttest	15	23.39	9.53				

Table 4 illuminates that the computed of 0.251 was observed to be non-noteworthy at .05 level. The H_{01} stood acknowledged that both the groups were equivalent to the extent their pre-test execution was concerned.

Table 5 clears up that the mean score of pre-test was 6.17 and that of post-test score was 23.39 for the experimental gathering. At that point the ascertained t estimation of the Experimental Group was 7.43, while at .05 level the basic quality was 1.69. So the hugeness level is at .05 level. The H_{02} is therefore rejected.

Table 6 demonstrates that the mean score of pre-test was 6.33 for the control bunch while the mean posttest score was 19.24. Along these lines the figured t worth was 4.47 while at .05 level the basic quality was 1.69 obtained t quality being noteworthy, and therefore the H_{03} stood rejected.

Table 7 portrays, the got t esteem (3.75) was more than the basic t (1.69) esteem at .05 level of essentialness. The centrality level of contrast between the mean addition score of exploratory and that of control gathering was at .05 level. Along these lines, H_{04} was rejected.

Table 8 demonstrates that the computed t estimation of 3.2 was discovered critical at .05 level. H_{05} stood rejected. Along these lines, it was reasoned that there was a critical distinction between the exhibitions of both the gatherings in their post-test scores.

Perceptions of Students towards Cooperative Learning

At the point when understudies were asked whether they enjoyed or disdained to work in gatherings, eight understudies loved it, two understudies had blended emotions and five understudies despised it.

Table 6: Control group: Significance level of difference between the mean score of pre-test and post-test

Test	N	Mean	SD	SE	t	t.05	P
Pretest	15	6.33	3.60	1.47	4.47	1.69	s
Posttest	15	19.24	8.16				

Table 7: Experimental and control group: Significance level of difference between their mean gain scores

Group	N	Mean gain score	Dif	SD	SE	t	t.05	P
Exp	15	17.22	4.31	8.49	3.11	3.75	1.69	s
Control	15	12.91		5.37				

Table 8: Experimental group and control group: Significance level of difference between their mean scores of post-test

Group	N	Mean	Dif	SE	t	t.05	P
Exp	15	23.39	4.15	1.9	3.2	1.69	n s
Control	15	19.24					

A few positives remarks were:

Yes I enjoyed working with the gathering. The fundamental preferred standpoint is that we can impart our thoughts to others. I think working in a gathering will enhance the nature of work in light of the fact that every progression of the lesson is checked by the all individuals from the gathering. I preferred learning in an agreeable setting. By cooperating, we can impart our perusing material to each other and we can make task agreeably.

Yes, I enjoyed working with a gathering. There is favorable position to gain from our class colleagues and have the capacity to impart and impart thoughts to them. Think working in a gathering that will enhance the nature of work in light of the fact that every part of the lesson is confirmed by the all individuals from the gathering.

I loved cooperative learning setting since we can finish our task with the assistance of each other. We can share our perusing material and it helped me dissect my own particular correspondence examples and style all the more comprehensively about how to build thoughts.

Loved functioning in an agreeable setting, somewhat great for me and truly delighted in it since I have a decent group for work. I never needed to stress that other colleagues would not do their part to add to the fruition of the

assignments. I needed to be set up to contribute at our gathering gatherings and for finishing our work.

By this we can understand the personalities of our classmates. I got a kick out of the chance to learn in a cooperative setting, in view of two reasons. First, the last item was waged than if I had made alone, in nearness of helpful feedback of others refined the nature of work. Besides, thoughts, blessings and capacities of others gave new existence of our work that I didn't anticipate. Subsequently, we needed to make an item together and we were delighted in the encounters and capacities of each other.

Understudies with blended emotions in regards to working in agreeable learning setting said as follows.

I have a blended feeling towards helpful learning I felt, that as a gathering, we could finish our undertaking in brief time than an individual would have the capacity to. We could examine our thoughts with each other and making proposals for development of undertaking. Then again now and then I was disappointed by not being in control of the entire procedure and the last item.

I felt that helpful learning went infrequently easily and some time was disappointing. I enjoyed gaining from others, yet not when dialog turned passionate. I like working in a gather-

ing, yet I didn't care for there are something since four unique individuals have diverse planning issues. In any case, I generally appreciate listening to other individuals' thoughts and having the capacity to ricochet my own thoughts of other individuals.

Some negative remarks from understudies incorporated the following:

I didn't appreciate the communitarian bit of this course because of the maquillages of the congregation. It was by all accounts troublesome for our gathering to meet up. All individuals from the gathering had occupied calendars, diverse encounters and foundations, dialect contrasts, and distinctive thoughts with respect to how to finish assignments. Generally I don't prefer to accomplish something helpfully, I feel that I can learn better in a customary classroom setting. Within the sight of various suppositions at times information can turn out to be all the more befuddling.

Attitudes toward Cooperative Learning

A few remarks from understudies who expressed that they would have not adapted progressively in the event that they had done their task alone incorporated the accompanying:

It's absolutely impossible that I would have educated as much on the off chance that I had finished this venture all alone. One of the colleagues has incredible information and capacity to sharing his insight and passing that learning onto others. Every colleague conveyed a special quality to the gathering that made our venture effective. Every progression of the lesson truly increased to clean. Got new thoughts from my schoolmates.

I think I adapted more. By teaming up with others I think my last venture is greatly improved. Working alone that I was not ready.

Understudies with blended emotions in regards to their learning identified with working helpfully as a gathering said the following.

I learnt all the more every segment of the topic working alone. In any case, I adapted substantially more about correspondence and collaboration working in a gathering.

Conversely, understudies who expressed that they would have adapted progressively on the off chance that they had adapted alone included the following remarks.

Yes, I feel that reliance on others in the congregation in order to complete stuff influenced my execution unfavorably. At the point when I was alone, I generally welled in time. I would have adapted more on the grounds that as opposed to investing energy concentrating on group administration, I could have invested additional time in readings. I did read everything and now my concepts are clear.

CONCLUSION

- ♦ The H_{o1} was acknowledged. The conclusion of the study was that the pre-test under-study achievement did not vary from each other for exploratory group and control group. Both the groups being verging on equivalent in science learning achievement before the test.
- ♦ The H_{o2} was rejected. The conclusion of the study was that the trial group demonstrated the diverse execution on the pre-test and post-test.
- ♦ The H_{o3} was rejected. The conclusion of the study was that the control group demonstrated the diverse execution on the pre-test and post-test.
- ♦ The H_{o4} was rejected. The conclusion of the study was that the normal change in the mean increase of test and control group contrasted as a consequence of teaching of various strategies. The test group was superior to the control group in their academic achievement.
- ♦ The H_{o5} was rejected. The conclusion of the study was that there was a noteworthy contrast in the normal academic achievement of the test group and control group as an aftereffect of teaching by various strategies. The normal academic achievement of the group educated by agreeable learning was better than that of the group instructed by as regular traditional teaching.

RECOMMENDATIONS

The study recommended the following points:

- ♦ Participants of this study were female students, however in this age mostly girls liked their peer group and they want to do work cooperatively. Furthermore, it should be applied to the students at university level in future.

- ♦ Cooperative learning helps those students who belong to different nationalities and cultures to interact with each other and to work effectively. It should be applied in classrooms as well as courses of professional development of multicultural learners.
- ♦ There ought to be an administration instructor preparing programs keeping in mind the end goal to furnish educators with present day showing techniques like cooperative learning, request strategy and group instructing. Use of cooperative learning needs a great deal of material, and it is suggested that adequate assets might be given to overhaul material.
- ♦ Instructors ought to be urged to create mechanical assembly and models from the accessible minimal effort indigenous material.

REFERENCES

- Abrami PC, Poulsen C, Chambers B 2004. Teacher motivation to implement an educational innovation: Factors differentiating users and non-users of cooperative learning. *Educational Psychology*, 24(2): 201-216.
- Arbab S 2003. *Effects of Cooperative Learning on the Achievement of 9th Class Students in the Subject of English*. MA Dissertation, Unpublished. Rawalpindi, Pakistan: PAF College of Education for Women, Chaklala.
- Baghcheghi N, Koohestani HR, Rezaei K 2011. A comparison of the cooperative learning and traditional learning methods in theory classes on nursing students' communication skill with patients at clinical settings. *Nurse Education Today*, 31: 877-882.
- Bibi A 2002. *The Comparative Effectiveness of Teaching English Grammar with the Help of Textbook and by Using Group Work Activities*. Doctoral Dissertation, Unpublished. Islamabad: Allama Iqbal Open University.
- Chianson MM, Kurumeh MS, Obida JA 2010. Effect of cooperative learning strategy on students' retention in circle geometry in secondary schools in Benue State, Nigeria. *American Journal of Scientific and Industrial Research*, 2(1): 33-36.
- Dillenbourg P, Baker M, Blaye A, OMalley C 1996. The evolution of research on collaborative learning. In: P Reinman, H Spada (Eds.): *Learning in Humans and Mathematics: Towards an Interdisciplinary Learning Science*. New York: Pergamon, pp. 189-211.
- Gay LR 2000. *Educational Research: Competencies for Analysis and Application*. 5th Edition. Florida: Florida International University.
- Haidari SM, Karlsson P, Mansory A 2013. *Cooperative Learning in Afghan Teacher Training Colleges: The Usage of Cooperative Learning in English Teaching and Learning*. Dissertation. Sweden: University of Uppsala.
- Harman G, Nguyen TN 2010. Reforming teaching and learning in Vietnam's higher education system. In: G Haaland, M Hayden, T Nghi (Eds.): *Reforming Higher Education in Vietnam: Challenges and Priorities*. London: Springer, pp. 65-86.
- Huiping N 2013. Social behavior and personality. *An International Journal*, 41(4): 557-561.
- Iqbal M 2004. *Effectiveness of Cooperative Learning on Academic Achievement of Secondary School Students in Mathematics*. Doctoral Dissertation, Unpublished. Rawalpindi, Pakistan: University Institute of Education and Research, Arid Agriculture University.
- Johnson DW, Johnson R 2005. New developments in social interdependence theory. *Genetic, Social, & General Psychology Monographs*, 131(4): 285-358.
- Johnson DW, Johnson RT 2008. Social interdependence theory and cooperative learning: The teacher's role. In: RB Gillies, AF Ashman, J Terwel (Eds.): *In the Teacher's Role in Implementing Cooperative Learning in the Classroom*, New York: Springer, pp. 9-37.
- Johnson DW, Johnson RT 2009. An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher*, 38(5): 365-379.
- Kagan S, Kagan M 2009. *Kagan Cooperative Learning*. San Clemente, CA: Kagan Publishing.
- Liang T 2002. *Implementing Cooperative Learning in EFL Teaching: Process and Effects*. Doctoral Dissertation. Taiwan: National Taiwan Normal University. From <http://www.asian-efl-journal.com/Thesis_Liang_Tsailing.pdf> (Retrieved on 20 November 2010).
- Mabrouk PA 2007. *Active Learning: Models from Analytical Sciences*. Washington, DC: American Chemical Society.
- Ministry of Education and Training of Vietnam [MOET] 2009. *Development Strategy from 2009 to Year 2020 for the Cause of Industrialization and Modernization of Vietnam*. Hanoi: Vietnamese Government.
- O'Donnell AM 2000. Interactive effects of prior knowledge and material format on cooperative teaching. *Journal of Experimental Education*, 68(2): 101-108.
- Parveen Q 2011. An experimental study on the effect of cooperative learning on academic achievement of 8th grade students in the subject of Pakistan studies. *International Journal of Academic Research*, 3(1): 950-954.
- Parveen Q 2012. Effect of cooperative learning and student achievement at secondary level in the subject of General Science. *International Journal of Educational Studies*, 5(2): 154-158.
- Prince M 2004. Dose active learning work? A review of the research. *Journal of Engineering Education*, 93(3): 223-231.
- Polloway EA, Patton JR, Serena L 2008. *Strategies for Teaching Learners with Special Needs USA*: Prentice Hall.
- Sahin A 2010. Effects of Jigsaw III technique on achievement in written expression. *Asia Pacific Educ Rev*, 12(3): 427-443.
- Sevgi T, Ali K 2012. The effect of problem-based Learning with cooperative learning strategies in surgery

- clerkships. *Journal of Surgical Education*, 69(2): 226-230.
- Siddiqui S 2003. Collaborative Approach to Language Learning. *Karachi Dawn*. January 26, P. 20.
- Slavin RE 1995. *Cooperative Learning: Theory, Research, and Practice*. 2nd Edition. Boston, MA: Allyn & Bacon.
- Slavin RE 2011. Instruction based on cooperative learning. In: RE Mayer, PA Alexander (Eds.): *Handbook of Research on Learning and Instruction*. New York: Taylor & Francis, pp. 344-360.
- Tran VD, Lewis R 2012a. Effects of cooperative learning on students at Giang University in Vietnam. *International Education Studies*, 5(1): 86-99.
- Tran VD, Lewis R 2012b. The effects of jigsaw learning on students' attitudes in a Vietnamese higher education classroom. *International Journal of Higher Education*, 1(2): 1-13.
- Vygotsky L 1978. *Mind in Society: The Development of Higher Psychological Process*. Cambridge, MA: Harvard University Press.

Paper received for publication on December 2015
Paper accepted for publication on December 2016