

Impact of Cooperative Learning Teaching Methods on 7th Grade Students' Academic Achievement: An Experimental Study

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Abstract

This paper aimed to report the findings of an experimental study to measure the impact of Cooperative Learning (CL) on students' academic achievement (AA). In order to pursue the objectives of study, Pre-test Post-test Control Group design was used. The experimental group was given treatment of CL method whereas no treatment was given to control group. Total 128 Students of grade seven were selected as participants from a public sector school. Treatment was given for 13 weeks. ANOVA test was applied as a statistical technique to examine within group and between group impacts. The findings of the study proved the efficiency of CL in the area of academic achievement as experimental group performed better in post-test than control group. In the light of the findings of the study, recommendations were made for different stakeholders for the improvement of teaching learning practices, particularly in General Science and generally for other subjects. As cooperative learning is cooperation based learning method, this study wished to share the results related to the effectiveness of CL that may be valuable for society especially for teachers' motivation to improve their teaching and learning practices to enhance students' learning. Limitation is related to sample and design. Only female students were taken as sample and researcher employed quasi experimental design to conduct experiment.

Key words: Cooperation, interdependence, interaction, academic achievement

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Introduction

Effective teaching is based on several factors such as positive reinforcement, advance organizer, cues and feedback, higher order questioning, positive classroom environment and cooperative learning (Walberg, 1986). It is therefore imperative for a teacher to be well equipped with all these teaching tools proceeding towards their classroom in order to produce better results. To this end many methods and strategies have been identified and practiced that has produced better and encouraged results. Among these the cooperative learning is most widely used and preferred method of teaching (Wolfensberger & Canella, 2015).

Cooperative learning is a teaching method that helps students learn together in groups to maximize their learning with great interest and motivation (Aziz & Hossain, 2010). According to Agashe (2005), education is integral to sustainable development and cooperative learning ensures sustainable future development.

Unfortunately the teaching methods and strategies adopted by teachers in Pakistan do not take into account the individual differences of the learners. Most commonly used teaching method is lecturing; chalk and talk (Sultana & Zaki, 2015; Jan, 2013; Ali, Tariq & Topping, 2012; Naseer, Patnam & Raza, 2009; Hussain, Inamullah & NaseerudDin, 2008; Sajjad; Sarwar, 2001). The traditional methods of teaching unfortunately have failed to ensure the quality learner. Hussain (2008) reported in his research that teacher's talk most of the time up to 80% and students get much less time to talk upto only 12% and remaining 8% is silent time. According to Sultana and Zaki (2015), the existing classroom environment does not support the implementation of interactive teaching methods in Pakistani classrooms. It is because the teachers either have not been trained enough to use wide variety of teaching methods/ strategies or aware of the needs of the learner (Garcia, 2008; Sharan cited in Baloch, 2011) or simply they assume that traditional method of teaching is appropriate for all students regardless of their diversity. Halai (2012) reports findings of her research that majority of teachers use traditional approaches while teaching General Science particularly and all subjects generally. Teachers teach Science in traditional way, which leads to promote memorization among students. According to Mahmood (2002); Iqbal, Azam and Rana (2009); Faiz, (2011), teachers are lacking science content knowledge as well as pedagogical knowledge. These researches reported that teaching of science is practiced in Pakistani classrooms just like delivery of facts in a language class. Students are asked to read lesson from text book or teacher reads lesson and explains verbally without performing activities to explain the concepts.

The classroom environment and organization is quite traditional, with row seating arrangement facing the teacher, students are engaged to only listen their teacher and understand and follow the instructions without being given a chance to actively participate in teaching and learning process (Najmonnisa & Haroon, 2014). According to Slavin, (1987, 1991) ; Johnson & Johnson, (2010) lecture based teaching facilitates individualistic and competitive learning environment that only facilitates gifted or high –achiever students rather than catering the learning needs of average and below average students. According to them traditional classrooms does not support social development of students It is argued that a student should be equipped with the knowledge, skills and must possess the kind of attitude that enables them to meet twenty first century challenges. It is argued that teacher’s role should be more of a facilitator rather than the controller of the learning process.

Cooperative learning is a teaching method, in which students of diverse background are assembled in groups to accomplish a common task (Ramos & Pavón, 2015). Cooperative learning is an instrument to facilitate diversity in classroom (Saravia-Shore, 2008). It helps students to build rapport with other students ((Soldier, 1989; Sturz, Kleiner & Fernandez, 2005). CL tasks promote interaction and cooperation among group members that leads to gain more academic and social competencies than working as an individual (Larson, 2012; Buchs & Butera,2015; Casey & Goodyear, 2015; Lirola, 2016;Sharan, 2015). Casal cited in Ramos & Pavón (2015) that Cl promotes students` learning motivtion and critical thinking. According to Aziz & Hossain (2010) CL facilitates to develop better relationship among gifted, average and below average learners, enhance their self-esteem and improve their attitude towards teaching subject. Johnson and Johnson (1989) CL emphasizes that students should take active role and should be engaged in the learning process and they should take the responsibility of their learning.

Cooperative Learning is an extensive research based strategy (Goodwin, 1999; Tan, Sharan & Lee, 2007; Thanh-Pham, Gilles & Renshaw 2008; Nguyen, Elliott, Terlouw & Pilot, 2009; Tran & Lewis, 2012; Ebrahim 2012; Reza, 2013; Kuri, 2013; Lau , Chong and Wong, 2014 ; Paul and Ray, 2014; Inuwa,Abdullah, & Hassan, 2015; Garcha and Kumar ,2015;Mashhadi and Gazorkhani, 2015; Phiwpong & Dennis, 2016) however despite of its effectiveness it has not widely been recognized in Pakistan (Najmonnisa and Haroon, 2014) and even not used in developed countries such as England Australia, America etc. (Jolliffe, 2015). According to Batool & Perveen, (2012) very few studies have been conducted in Pakistan to assess the level of effectiveness of CL on academic achievement. These studies have been carried out in the areas of Social Studies, Mathematics, General

Science and English (Iqbal 2004; Ahmed & Mahmood, 2010 ; Ahmedn.d.; Ahmed, 2010; Akhter, Kiran, Perveen & Rashid ,2012; Arbab, 2003; Arif, Mahmood, Mahmood & Parveen, 2011 ; Khan , 2008; Khan & Inamullah, 2011; Javed, Saif & Kundi, 2013) however all above studies were conducted by using True Experimental Research Design and samples were selected on the basis of Randomization with small class size. The current study is designed to measure the impact of CL methods on students' academic achievements in the subject of General Science by using quasi experimental research design with large sample size.

Objectives of the Study

Objectives of the study were:

- i. To measure the impact of CL on students' academic achievement over the period of time
- ii. To measure the impact of CL on students' academic achievement across experimental and control groups
- iii. To measure the impact of CL on students' academic achievement in terms of over the time performance variance across experimental and control groups

Literature Review

According to Tomasello (2009) cooperation is inherent characteristic of a human being and it is not a learned behavior, rather it can be promoted. In support of his argument he said that, "As children grow their almost reflexive desire to help--without expectation of reward--becomes shaped by culture". Children tend to perform their role in social settings and convey mutual expectations. In all educational settings across the world, cooperation and teamwork are widely supported (Jolliffe, 2015) such as from business to social sciences and education and at all levels such ECED to Tertiary level (Slavin, 2015). Several terms are being used interchangeably to define CL such as Collaborative learning, teamwork and group work. An enormous body of research reports the benefits of CL with respect to academic achievement in many subjects, language acquisition, decline in absenteeism, collegiality, social unity, acceptance of diversities, gender equity, etc. (Esiobu, 2011; Slavin, 2015) .

Johnson and Johnson (1989) reported five elements of CL that are Positive Interdependence, Face to Face Interaction, Individual accountability, Group Reflection and Social Skills. According to Slavin, (2015) pupil work together in small groups on a collective task which guarantees positive interdependence, individual accountability strengthened by the social skills.

Positive Interdependence, is a significant element of CL in which group members are interdependent on each other to achieve a common goal and success of one member is dependent upon the success of whole group (Novitasari & Ardi, 2016; Casey & Goodyear, 2015; Slavin, 2015 cited Johnson and Johnson, 2000; Slavin, 1995; Kagan, 1994; Cohen, 1994; Leonard & McElroy, 2000; Sharan & Sharan, 1992, 1994; Ramos & Pavón, 2015). Kourilsky and Wittrock, (1992) cited Slavin's synthesis, in which Slavin states that "cooperative learning enhances academic achievement in school" by coupling a common group goal with individual accountability for learning (p. 381).

Cooperation requires direct face to face interaction among the group members "to produce a product and involves processes such as negotiations, discussions, and acceptance of the opinions of other group mates" (Kozar, 2010, p. 17). Face to face interaction facilitates mutual success among group members (Ramos & Pavón, 2015). Using cooperative learning methods, the students during and after CL task are encouraged to reflect on their group performance so that in future they can do it in a better way (Altun, 2015). Cooperative learning also develops students' social skills improve their communication skills and conflict resolution strategies (Goodwin, 1999).

CL has strong theoretical foundation. It is rooted in Constructivist, Social Constructivist, Social Cohesion and motivational perspectives. According to the constructivist view of learning students learn best when they are effectively engaged in learning process and working in a joint effort with different students to achieve a common goal. While Constructivism concentrates on individual experience for learning new concepts and skills. Cooperative learning employs not just the students' own particular experience to grasp information, additionally utilizes the encounters of others. Learning becomes meaningful when teacher promotes interaction and communication in classroom for promotion and construction of new knowledge based on previous or existing knowledge; and children exchange knowledge with other learners rather presentation of information and asking to read a passage from the book by the teacher (Sharan, 2015).

According to motivational perspective, students make collective efforts to achieve the set targets as they are motivated to achieve the goal. Slavin (1995) argues that in cooperative Learning tasks "team rewards, individual accountability and equal opportunities for success" served as motivating force (p16). Thus, in CL tasks group members not only help each other but motivate each other to put maximum efforts, "since they are clear that their contribution to teamwork can be individually identified and assessed" (Ning & Hornby, 2014, p. 109).

From Social Cohesion perspective, group success/achievement is mediated by group cohesiveness. According to this perspective group members cooperate with each other because “they care about one another to succeed” (Slavin, 1996, p 536).

CL and Academic Achievement

Findings of various researches support the benefits of CL in the area of academic success and social skills (Slavin, 1995, 1996, 2015). These findings motivate teachers to use CL in their classrooms. Recently in a, meta-analytical study reviewing 11 reviews of similar studies and analyzing Hattie’s (2009) synthesis of the meta-analyses found that “cooperation has relatively consistent positive effects on achievement, attitudes and other variables” (Kyndt et al. 2013, pp 137).

Ballantine and Larres (2007) and Phiwpong & Dennis, (2016) in their studies using questionnaire ascertaining the perceptions of students regarding improvement in their generic skills who were taught by CL method found that student perceived and reported cooperative learning was effective method in improving their generic skills.

Ebrahim (2012) in an experimental study comparing the effectiveness of lecture method and CL on students’ achievement in science subject/s and their use of Social skills with a sample of 163 elementary science girl students in eight different sections of grade five found that students in experimental group taught by CL showed a significant academic achievement and social skills. Similar findings were also reported in another study by Reza, Abozar, Ali and Akbar (2013) indicating that CL showed a significant effect on students’ academic achievement and SS on students in experimental group.

Ahmed and Mahmood (2010) in an experimental research study doing a comparative analysis of the effectiveness of three teaching methods of traditional instruction, loosely structured CL and Students Team Achievement Division models of CL on students’ academic achievement concluded that CL (STAD) model enhanced experimental group students’ academic achievement as well as facilitated to enrich and make the learning experience more enjoyable for them as compared to students in control group.

Kuri (2013) conducted an experimental study to assess the impact of CL on student’ academic success. Experimental group was treated with Learning Together model of CL in the subject of geography. Control group was left untreated. Data analysis showed the effectiveness of CL model in terms of academic success. These findings supported the findings of Kosar (2003).

Reza (2013) performed an experiment (Pre-Test Post Test control group research design) in Tehran intended to measure the impact of CL on first grade male students' academic achievement in science subject and the level of their test anxiety. Data analysis revealed the effectiveness of CL on academic success and in reducing test anxiety.

Lau, Kwong, Chong and Wong (2014) conducted an experimental study to assess the effectiveness of CL to improve the students' teamwork skills. Researchers administered questionnaire among students twice before the implementation and after, the implementation of CL strategy followed by interview. Findings of the study reinforced the effectiveness of CL in terms of behavioral change. The findings further indicated that students were willingness to help out other team members to achieve a common goal.

Mashhadi and Gazorkhani (2015) conducted a study by employing Quasi experimental design on a sample of hundred prospective teachers (Experimental and control groups) of teacher training centre employing probability sampling technique. Experimental group was taught by CL method whereas Control group was taught by lecture method. Results showed the noteworthy difference between the test performance of both the groups. Experimental group performed better (average score= 15.90) than control group (average score= 13.96).

Garcha and Kumar(2015) reported that CL (Jigsaw strategy) is effective for Critical thinking dispositions of secondary school students. Researcher employed Control group pre-test post test design and 116 students of grade 9th were taken as sample. The researcher employed ANCOVA technique to analyze the data. Data analysis showed that students taught by CL strategy (Jigsaw) (Mean=27.12, N=57) achieved significantly higher critical thinking dispositions as compared to students taught by traditional method of teaching (Mean=22.39, N=59).

Paul and Ray (2014) validated a theoretical model by conducting an experimental research in laboratory setting to assess the effectiveness of virtual teams. Their research findings revealed that diversity among group members had effect on group atmosphere and group atmosphere played a positive role to develop mutual understanding among team members and increased team participation. Moreover, mutual understanding among team members decreased task conflicts among them.

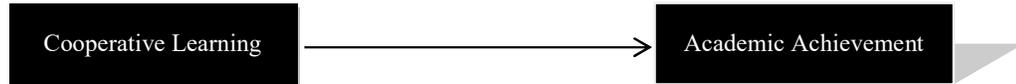
To know the teachers' perceptions about CL, and their students' responses to CL teaching method Gillies and Boyle (2011) interviewed 7 teachers who were implementing CL for more than two years found that the teachers were holding positive perceptions about CL indicating that it helped students in gaining confidence, improving academic achievement and preparation for future job market.

Hypothesis

H₁: There is statistically significant difference between the academic achievement of students of Control group and experimental group over the period of time.

H₂: There is statistically significant difference in between the academic achievement of students of Control group and experimental group across the period of time

H₃: There is statistically significant difference in between the academic achievement of students of Control group and experimental group in terms of over the time performance variance across experimental and control groups.



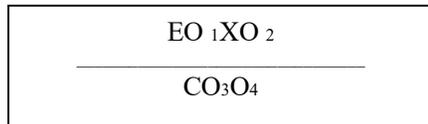
Methodology

The current study was quantitative in nature and Quasi-experimental research design was used in which Pre-test Post-test Control Group design (Campbell & Stanley, 1963) was used to measure the impact of CL on students' academic achievement over the period of time, across the period of time and over the time performance variance across experimental and control groups. The sample of the study comprised of all 128 students of two sections of 7th grade of a public school. The sample was selected using the purposive sampling technique as the randomization was not possible to conduct experiment in large number of schools. For the purpose of convenience one section of students was treated as control group and the other as experimental group.

Research design

Following is the research design used for the study.

Explanation of Pre- Test, Post- Test Control Group Model



Where:

E = Experimental group

C = Control group

X = Treatment

_____ = non randomization of experiment and control groups

O₁ and O₃ = Pre-test scores of control and experimental groups

O₂ and O₄ = Post-test scores of control and experimental groups

Academic achievement of control group and experimental group was measured by using pre-test post design before and after the treatment. A public school situated at Chenesar Goth Karachi, Pakistan was selected and 2 sections of class seven were designated as control groups and experimental groups. 128 students were enrolled in both the sections. Due to administrative limitations randomization was not possible, as school head did not permit to reorganize the groups, for this reason Quasi-experimental research design was adopted. One science subject teacher was (nominated by the management) was trained in the area of CL method before the experiment. Researcher performed role of a mentor and “participant teacher”. Experimental group was given treatment of CL and the control group was not given any treatment and taught by traditional lecture method. The experiment was single blind and students were not informed about their status of control group and experimental group during the experiment.

Pre-test and Post-test

With the help of two science teachers a teacher made test was developed to measure the academic accomplishment of students. Test was reviewed by 3 subject specialists, two university professors and research supervisor to certify the content, judgmental and face validity of the test. The test items questions were taken from the textbook of “General Science for class VII” of Sindh.

Pilot study was conducted on small group of students of grade seven in same school before finalization of the test. Pre-test was conducted before the experiment to equate both the groups (control and experimental) and same test was conducted after completing the experiment as post-test.

Data Analysis

Mixed designs ANOVA test was applied as a statistical technique to examine within group and between group impacts. Mixed designs ANOVA is the extension of parametric test which is suitable to apply on numeric data. In current research, student performance was measured in numeric form; therefore, parametric test was appropriate to apply. Following table portrays the test of normality for the post test scores of student performance. Insignificant results ($p > 0.05$) of Kolmogorov-Smirnov test implies that distribution of post test scores is normal. In addition, Cronbach’s Alpha was used to measure the internal consistency of items. As a rule of thumb, items are considered reliable to measure a particular construct if the Cronbach’s Alpha value is greater than 0.7. In the current research, Cronbach’s Alpha is 0.836, which is greater than 0.7. This implies that the used eleven items were reliable to measure posttest performance of students.

Table 1

Tests of Normality and Reliability Analysis

	Kolmogorov-Smirnov ^a			Reliability Analysis	N of Items
	Statistic	df	Sig.	Cronbach’s Alpha	
post Test Scores	.069	128	.200*	.836	11

Mixed design is a mixture of repeated measures and independent designs. It is appropriate to apply due to the reason that it simultaneously study the variance in performance over the time as well as between experimental and control groups. Moreover, as per the best knowledge of researcher no or very limited studies are available in Pakistan to utilize this kind of advance statistical technique to test the hypotheses.

Table 2
Descriptive Statistics

	Test Group	Mean	Std. Deviation	N
	Control Group	11.9206	3.38069	63
	Experimental Group	12.3692	2.85356	65
	Total			
Scores of Pre Test				
	Hgthg p0 [p[-,k 789 5t 6yu5-[,k 789 5t 6yu5- [,k 789 5t 6yu5-[12.1484	3.11989	128
	Control Group	55.10	12.755	63
post Test Scores	Experimental Group	74.45	10.540	65
	Total	64.92	15.157	128

Descriptive statistics table revealed the number of observation, mean and standard deviation across pre and post test scores. In this table, number of observations in control and experimental groups are 63 and 65 respectively. As per this table, average pretest performance scores are approximately equal across control and experimental group; moreover, both groups show almost same level of variation. On the other hand, posttest scores seem to reveal far variance across control and experimental groups. There is noteworthy difference in between the academic accomplishment of students of Control group and experimental group over the period of time.

Table 3
Multivariate Tests^a

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power ^c
	Pillai's Trace	.963	3284.988 ^b	1.000	126.000	.000	3284.988	1.000
	Wilks' Lambda	.037	3284.988 ^b	1.000	126.000	.000	3284.988	1.000
Performance	Hotelling's Trace	26.071	3284.988 ^b	1.000	126.000	.000	3284.988	1.000
	Roy's Largest Root	26.071	3284.988 ^b	1.000	126.000	.000	3284.988	1.000
	Pillai's Trace	.457	105.952 ^b	1.000	126.000	.000	105.952	1.000
	Wilks' Lambda	.543	105.952 ^b	1.000	126.000	.000	105.952	1.000
Performance * group	Hotelling's Trace	.841	105.952 ^b	1.000	126.000	.000	105.952	1.000
	Roy's Largest Root	.841	105.952 ^b	1.000	126.000	.000	105.952	1.000

a. Design: Intercept + group
Within Subjects Design: performance

b. Exact statistic

c. Computed using alpha = .05

Multivariate test table represent the fitness for mixed design model. As Field (2013) suggested that if the p value column depict a value lesser than margin on error (0.05), multivariate model would be significant. In the table mentioned above, F statistics and its associated significant value (p value <0.05) portray appropriateness of the overall model for all the multivariate tests - Wilks' Lambda, Pillai's Trace, Hotelling's Trace and Roy's Largest Root.

Table 4*Tests of Within-Subjects Contrasts*

Measure: MEASURE_1

Source	performance	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power ^a
Performance	Linear	177202.8	1	177202.8	3284.9	.000	3284.988	1.000
Performance * group	Linear	5715.367	1	5715.367	105.952	.000	105.952	1.000
Error(performance)	Linear	6796.847	126	53.943				

a. Computed using alpha = .05

Tests of within-subjects contrasts table is used to represent the variance of performance of students over the time. In this table, $F(1,126) = 3284.988$, $p < 0.05$ for performance represent noteworthy difference in performance of students over the time irrespective of whether they were part of experimental or control group. In addition to that, larger F statistics for performance * group $F(1,126) = 105.952$, $p < 0.05$ depict that scores for pre and post-performance of students were significantly different for experimental and control group. This result in support of research hypothesis that there is a noteworthy difference in pre and post-performance of students taught through traditional and CL methods.

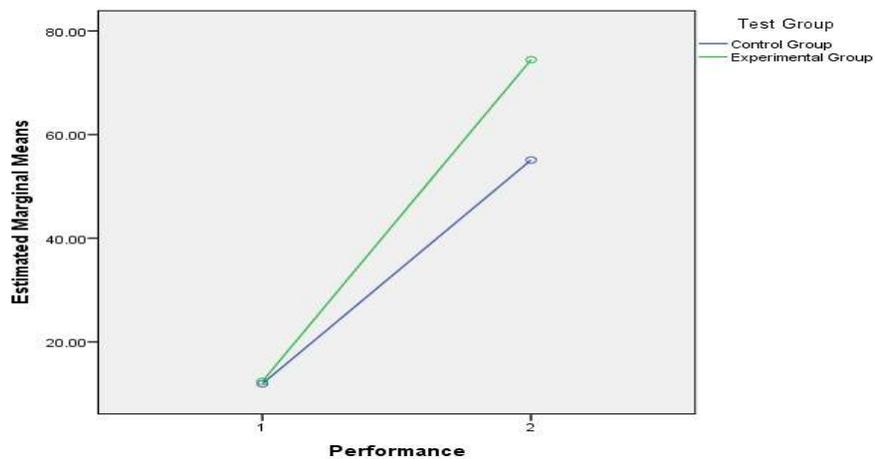
In the previous table, over-the-time variance in performance of students was observed. Tests of Between-Subjects Impact is used to examine the average performance of students across experimental group. In the table associate F statistics $F(1,126) = 67.936$, $p < 0.05$ was found to be significant for group. This implied a noteworthy difference in performance of students who were enrolled in experimental and control groups. Therefore, the research hypotheses "There is noteworthy difference in between the academic accomplishment of students of Control group and experimental group across the period of time" is supported.

Table 5*Tests of Between-Subjects Impact*

Transformed Variable: Average Performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	378532.455	1	378532.455	4100.904	.000
group	6270.799	1	6270.799	67.936	.000
Error	11630.384	126	92.305		

Below figure is a portrayal of variance of over the time performance across experimental and control group. As per the figure, performance of both groups – experimental and control – in pretest scores is same. However, a significant improvement can be observed in the posttest scores for those trained through CL strategy. Therefore, the research hypotheses “There is noteworthy difference in between the academic accomplishment of students of Control group and experimental group in terms of over the time performance variance across experimental and control groups” is supported.



To summarize, mixed design ANOVA revealed that there is a noteworthy difference in pre and post test scores of students across experimental and control group. It means that overall performance was improved in posttest scores of students as compared to their pretest scores. In addition to that, those who were taught through CL strategy performed better as compared to those taught through traditional strategy.

Discussion on Findings

Data analysis revealed the effectiveness of CL on students' academic achievement in the subject of Science. The findings of the study supported the findings of the previous studies such as Johnson, D. W. (1998), Ahmed & Mahmood (2010), Ebrahim (2012), Reza (2013). Post-test results show that the students of experimental group's achievement level was improved significantly and was higher than the students of control group. These results verified the usefulness of CL over the traditional lecture method. These findings corroborate the findings of the earlier studies conducted by Ebrahim (2012); Akhter (2012) indicating that CL strategy promotes the rate of achievement in the subject of science. Students gain more understanding and acquire scientific knowledge and skills taught by CL method. The results were also congruent with those of earlier studies, which compared CL methods with that of lecture method, or independent styles of instruction (Slavin, 1991; Johnson & Johnson, 2000). According to researches, when students from different linguistic and ethnic backgrounds get an opportunity to interact and learn together, this diversity adds colors to classroom life. In a classroom where the teacher values diversity and presents herself as a role model, students also appreciate diversity and respect each other (Obler, Arnold, Sigala & Umbdenstock, 1991). When a teacher assembles the students with different skills and different ways of solving problems, they interact with each other and find the solution of classroom problems in more effective manner than working in isolation as an individual (Larson, 2012) and this teamwork increases their achievement rate as well (Nichols & Sullivan, n.d)

Learning has become synonymous with competition in Pakistani classrooms; competition for marks/grades and teacher recognition and praise (Khan, 2008). According to Slavin (1996), "Traditional classrooms expect students to work independently and to compete for good grades, teachers' approval, and recognition"(p.1). It is generally observed that the classroom environment is not conducive for cooperative learning (Johnson, D. W. & Johnson, 1994). In such a classroom environment, each student works as a one-man-team, gets involved in competition with all other-one-man teams in the classroom and thus eliminates all possibilities of cooperative learning of helping others or seeking help from others. Helping others in such competitive environment appears a foolish strategy as it may create room or chance for others to perform equally better which is quite not acceptable to the competitors; and seeking help from fellow learner is a sign of humiliation and defeat in learning competition. She is told, "Keep your eyes on your work", "don't share", "don't talk", "don't discuss". The findings of the study indicated that an environment conducive to learning can be created if the students are allowed and provided the opportunity to cooperate and help each other in their academic related matters.

The findings of the study have implications for teachers, school administrators and curriculum designers and developers. The findings of the study are clear in suggesting that teachers should involve students in teaching learning process by engaging them in cooperative learning strategy. As application of this method can improve significantly the academic achievement of the learner. CL enhances the chances of cooperation among students and the helping each other in their academics and such an attitude mitigates the effects of unhealthy competition among students for grades and marks.

The findings of the study also have implications for curriculum designers and developers to include content and suggest teaching strategies similar to Cooperative learning where students develop the positive attitude and habits of helping their class fellows in sorting out their academic related problems.

For administrators the findings are clear enough to think about convincing the teachers to use cooperative learning teaching strategy for improving the academic achievement of students.

Conclusion

On the basis of the analysis of the data, it can be concluded that CL yields more significant results as compared to traditional lecture method. The students improve their academic achievement when the cooperative learning is used as teaching strategy by the teacher. Pakistani classrooms are beset with cultural variety. Use of CL strategies will encourage open-mindedness and harmonization among the students. In order to implement CL strategies in the context of Pakistani classrooms, a major shift calls for a conceptual, institutional and policy level changes in Pakistan.

Recommendations

Further studies may be conducted in the light of the following recommendation:

1. The study should be replicated with a larger sample of students of both gender in public and private schools to determine that findings of this study hold true.
2. The research studies on effectiveness of CL in relation to SS, group cohesion, and language acquisition, critical thinking is recommended
3. Teachers training institutions should incorporate CL strategies in their Professional Development programs particularly in Science.

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