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Cooperative Learning as a Window of Opportunity to Transact Mathematics Instruction in Alamata and Korem Secondary Schools of Tigray, Ethiopia

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ABSTRACT

Mathematics instruction would be more effective if students were able to help each other and exchange information actively. This can effectively be done when students are engaged in cooperative learning. The study was intended to analyse the extent to which mathematics education is supplemented with cooperative learning in Grade 9 of Secondary Schools in Alamata and Korem, Tigray. In order to address the research objectives, mixed methods design was employed. Questionnaires, interview and classroom observation were used to collect quantitative and qualitative data from a sample of 15 teachers and 322 students. The data was analysed using descriptive statistics. The results of the study revealed that the extent of practicing cooperative learning methods was not up to the expected level. The attitude of teachers toward using cooperative learning methods was favourable and yet, teachers' action in dealing with the basic components of cooperative learning was not promising. The findings showed that the major factors that inhibit the implementation of cooperative learning were lack of adequate training, lack of classroom facilities, lack of administrative support, lack of time, dependency of slow learners on more able learners, and traditional teaching methods. It is suggested that teachers should take basic training about the use and deliberation of cooperative learning as one of innovative teaching methods of mathematics education and as a means to realize their commitment.

Key words: Attitude, Cooperative Learning, Mathematics Education, Secondary Schools, Ethiopia

INTRODUCTION

Different research outputs on cooperative learning (CL) across various disciplines have been carried out in different educational levels and settings (Celikten, Ipekcioglu, Ertepinar, & Geban, 2012). In the acquisition of new concepts, improvement has been demonstrated on students' mathematics performance across wide range of abilities, grade levels, and ethnicity while using CL strategies. According to Law (2011), CL encourages students to articulate and comprehend the meaning of compositions within small groups. It is found that CL stimulates students' interests and intrinsic motivation. In CL settings, students can respond to multiple circumstances in a variety of ways if they find it fun, engaging or boring (Slavin, 2006). Accordingly, it is advised that teachers should carefully choose and employ CL strategies based on the material being taught, interest and learning styles of a student.

Studies have been undertaken on the effects of CL strategies to enhance students' learning in mathematics (Tracey, Madden, & Slavin, 2010). Hooker (2011) stated that CL has effect on the magnitude and intensity of acquiring of mathematical notions. Similarly, Nichols (2006) argues that students receiving CL experienced inherent valuing of activities in mathematics, self-efficacy, and learning perspectives. From the findings of previous studies, it can be inferred that CL group instruction is the best strategy to effectively promote expected differences in student perceptions, motivation and performance in their upcoming school years.

Policy analysis reveals that Science, Technology, Engineering, and Mathematics (STEM) education is an emerging and crosscutting paradigm which focuses dominantly on disciplines in science and mathematics (Bybee, 2010). In this regard, studies indicate that very few research results

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are available that examine essential skills, beliefs and knowledge necessary for teachers to materialize integrated instruction that promote students' learning (Frykholm and Glasson, 2005). As an aspect of active learning, CL helps students to interact each other to perform well and apply course material in mathematics lessons (Lea, Stephenson, and Troy, 2003). According to Felder and Brent (2001), CL as a mathematical teaching technique is a means to learn in buzz and mixed groups. With this kind of learning approach, students can learn by themselves without continuous and immediate intervention of the teacher. It is one of the core active learning approaches to ensure enormously effective instruction. The central goal of CL in mathematics education is to develop skills in problem solving, predispositions and values (Zakaria and Iksan, 2007).

Cooperative learning is an instructional approach that has captured attention at the moment because studies disclosed the fact that students success in academic and social environment attended when they have opportunities to interact each other to realize common goals (Johnson & Johnson, 2002; Marcia, 2000; Slavin, 2006). CL is found to be successful teaching strategies with students of different ability levels to advance their knowledge of a particular subject (Qiao & Jin, 2010).

Ethiopian Ministry of Education commented that most of the country curricula and teaching methods embedded in them are suffered from the old and traditional approaches (MoE, 2002). As a result of this, curriculum revisions were made and different programs were designed to provide quality training with continuous and dedicated implementation of active learning at different levels. Among these, the introduction of Teacher Education System Overhaul program that emphasizes on participatory and active learning methods in pre-service and in-service programs of teacher education was the major one (MoE, 2003). The above statement emphasized that the use of active learning in general and CL in particular are means to sustain quality learning in teacher education programs.

Objective and Research Questions

In the Secondary Schools of *Alamata* and *Korem Towns*, teachers and school leaders are advised to consider cooperative learning as a means to facilitate students learning. However, no or very few studies have been conducted to investigate the learning difference brought as a result of cooperative learning. Accordingly, this study was targeted to analyze to what extent CL is implemented, and supports students' learning in Secondary School mathematics of *Alamata* and *Korem* towns. More importantly, the study might provide insights about the implementation of CL methods in the study area in particular and other Secondary Schools of the country in general. The following research ends was developed to guide the study under investigation.

1. How does the implementation of CL transacted?
2. What is the attitude of mathematics teachers and students towards CL?
3. To what extent teachers are committed to employ CL in mathematics classes?
4. What factors strongly debilitated the implementation of CL in mathematics instruction?

REVIEW OF RELATED LITERATURE

An Overview of Cooperative Learning in Mathematics Classroom

From time to time scholars have given definitions on cooperative learning. For example, Felder and Brent (2010) define cooperative learning as a strategy in which learners engaged in groups on tasks or project to satisfy predetermined criteria. One of the criteria to be satisfied may include that team members are accountable for the completion of individual task to facilitate the completion of group assignment or project. Similarly, Johnson, Johnson and Holubec (2013) stated cooperative learning as a learning approach in which small groups work together to maximize individual and team learning.

Mathematics has been part and parcel of Secondary School curriculum. And, the major objective of learning mathematics is to offer students hold appropriate and essential knowledge in mathematics and become productive citizens of the society (Johnson & Johnson, 2003). Scholars discussed about the relationship between CL and mathematics achievement, and clearly explained why students need CL in their learning situations. In this connection, various instructional methods have been encouraged to be employed in mathematics classroom (e.g. Lou, Abrami, & Spence, 2000; Slavin, 2006; Sezer, 2010). As a result, it is suggested that teachers should employ their delivery method in a way students are benefitted more in acquiring knowledge, attitudes and values, and problem solving skills through the acquisition of concepts in science and mathematics.

Science and mathematics education is given on the assumption that students can accomplish better achievement, problem solving skills, favorable attitudes and values. In this regard, Effandi (2003) conducted a study on how CL impact learners' performance and skills in problem solving. The result revealed that CL group instruction demonstrated consistently improved achievement in problem solving and mathematics. Also, the study revealed that learners in the CL group responded positively towards learning together and concluded that the implementation of CL is a desirable alternative over the conventional teaching approaches.

Another study by Liang (2002) found that students who taught by CL surpassed the students who were constantly involved on individualized learning milieu in problem solving. Similar study was conducted by Rahaya (2008) with a sample 1180 cases in 18 schools using jigsaw as a model. The study underpinned that CL has a potential to promote scientific skills, ensure enquiry learning and secure better achievement in science. More importantly, learners experienced that group learning is enjoyable.

Factors Affecting the Practice of Cooperative Learning

Among the key factors necessary in the successful implementation of mathematics instruction is the training of teachers

in the procedures of CL. Lou et al. (2000) enunciated that as teachers involved in such training they were more able to transact their instruction to buzz group to perform more. Gillies (2003) mentioned that both students and teachers need to be trained to manage the demands of small group work effectively. Students need explicit training in the interpersonal and small group skills that facilitate cooperation. Liang (2002) claimed that for successful implementation of CL, teachers need to have training in advance to obtain essential knowledge, skills and attitude in delivery of contents. Similarly, Seid (2012) noted that the absence of orientation or insufficient training may have an adverse effect for effective implementation of CL in a classroom. Jolliffe and Hutchinson (2007) pointed out that teachers trained in the philosophy of CL, administrative support and group meetings amongst teachers for support and exchange ideas are the most essential ingredients to implement CL effectively. Meanwhile, Aronson (2000) emphasized teachers to use optimum time and experience to effectively accomplish CL strategies.

Research in the area of CL uncovers the fact that lack of acquaintance with variety of assessment methods is a concern repeatedly mentioned by teachers who are inexperienced with CL (Law, 2011). In this regard, Mathematics teachers are lack appropriate knowledge on how to assess group efforts and fix grades to groups. Teachers assume that individual responsibility will be eroded or that one student can dictate the group or carry on the overall assignment of the group. Ogunleye (2011) recommended methods appropriate for assessing CL groups. For Ogunleye, teacher observation during group work; group grading for projects; peer evaluation, measuring the extent of contribution of each group member and individual quizzes, exams or assignments are indispensable approaches for assessing CL groups.

Students in CL need to be given adequate time to discuss on issues to bring the expected behavioral change. According to Materu (2007), individual student and group members need to have appropriate time to learn the required knowledge and skills to the extent they are expected to acquire. Similarly, Sezer (2010) mentioned that proper time should be allotted for students to function as CL teams where they learn to rely on, to cooperate and learn each other. With insufficient time, students may become discouraged and not function properly as a CL team.

Attitudes of Teachers and Students toward Cooperative Learning

According to Johnson and Johnson (2011), CL group develops positive student- teacher attitudes. This is because when teachers understand more about the behaviors of their students, they have opportunities to create more rapport with learners for further actions in CL groups. As a result, the lines of communication are opened and encouraged, and that the empowerment created through interpersonal interactions can lead to a favorable predisposition by all parties engaged.

Studies indicated that teachers perceive CL as having learner sit in juxtaposition around table and able to talk each other as they do individual assignment. However, the goal of CL is not allotting a task to a group of learners where one learner does all the work and others write their names on the final document. As indicated by Seid (2012), teachers may shy or lose control of teaching routine due to lack of confidence. Thus, it is necessary to build their knowledge and confidence through mentoring and training. Galton et al. (2009) stated that giving up the opportunity for variety of training may deter teachers from using CL in their classroom.

Vaughan (2002) argued that initially, some learners and teachers express cynicism about the value of CL, or feel that class time is best spent while hearing from the teacher rather than working with students who, they believe and recognize as little as themselves. Similarly, Christison (1994) argued that most students who came to school expecting the conventional classroom arrangement with the teacher in front of the class and students in straight rows listening and watching the teacher, are confused and hesitated when these expectations are not met.

Machemer and Crawford (2007) found that unless CL is related to examinations, student valued it less than lectures or other forms of student-centered learning. Hillyard et al. (2010) claimed that students' attitudes towards CL were highly related to their perception of the value of peer teamwork and their experiences with working in team. In this regard, teacher's clarity in explaining the pursuit of group work is highly emphasized and can negatively influence students' active engagement in CL.

Hammond, Bithell, Jones, and Bidgood (2010) explained that students valued the social dimensions of working with peers and yet, they were less likely to agree that CL helped them perform better in assessed tasks. Students perceive CL group work as a classroom management technique employed by teachers mainly to reduce their load in assessment and of little or no benefit to students (Siegel, 2005). Overall, one of the solid concerns that learners have about CL is the likelihood that group assessment may not objectively assess individual contributions.

METHODS

A mixed design with inclusion of quantitative and qualitative approaches was employed. The study focused on Grade 9 students and their mathematics teachers in three schools of *Alamata* and *Korem* towns. Two Secondary Schools in Alamata and one in *Korem* towns were selected purposefully. The total population of grade 9 students was 1995 (930, 640 and 425 from *Zikre, Tadagiw*a and *Korem* respectively). Using simple random sampling method, 296 students were considered for this study. Moreover, all 13 Grade 9 mathematics teachers of the three schools were considered using convenience sampling methods.

To obtain the necessary data, checklist (to assess classroom conditions), questionnaire (students and teachers) and semi-structured interview (teachers) were employed. A questionnaire that involved general information of respondents and items related to research questions was prepared. Appropriate steps to check the reliability of the questionnaire were taken. The reliability of the tool (questionnaire) was computed by Cronbach's alpha method and found to be 0.83. This

means that the instrument plausibly keeps adequate internal consistency.

Descriptive statistics was employed to test the mean differences of respondents towards CL across the three schools. Any communication with the concerned bodies was accomplished at their voluntary basis without harming and treating the personal and institutional well-being.

RESULTS AND DISCUSSION

The Practice of Cooperative Learning

To assess the extent to which CL strategies are practiced in classroom instructions, the researchers developed observation checklist. The observation was focused mainly on practical application of CL and suitability of the classroom.

As depicted in Table 1, the data obtained from classroom observation portrays that 66.7% and 83.3% of the observation results indicate that the suitability of seats and the background of classrooms, respectively were not suitable for effective implementation of CL. Similarly, in the classrooms being observed, 83.3% of the observations showed that there was no enough space for teachers to move and monitor groups' activities. Regarding availability of seats, there were enough seats but they were not arranged in a way suitable to lucratively implement CL. The data in Table 1 disclosed that the numbers of students were manageable (there were 40 and below 40 students in each classroom being observed). The data indicate that, though there were enough seats, they were not placed comfortably.

In the open-ended items, teachers complained that classroom conditions were not supportive for the proper implementation of CL. In this connection, a study by Esmonde (2009) showed that in CL, students can adapt to a variety of positions to provide equitable structures for mathematics group work. It is argued that making classroom conditions supportive and attractive for CL implementation is useful for meaningful instruction.

Table 1. Classroom conditions

No.	Item	Yes	%	No	%
1.	Seats are suitable to transact CL.	2	33.3	4	66.7
2.	There is no enough space to move in classroom	5	83.3	1	16.7
3.	The backgrounds of the classrooms are suitable.	1	16.7	5	83.3
4.	There are enough seats.	4	66.7	2	33.3
5.	Number of students is not manageable.	2	33.3	4	66.7

Table 2. Teachers' attitude toward CL

No.	Items	Mean	SA or A (%)	SD /D (%)
1.	CL is a valuable instructional approach.	4.15	84.62	15.38
2.	I believe students distaste active participation	2.46	69.23	23.07
3.	I have too little teaching experience to implement CL.	2.46	76.92	23.07
4.	It is impossible to learn actively in large classes.	3.85	30.77	69.23
5.	CL affects positively students' academic achievement.	3.85	84.62	15.38
6.	Positive interdependence among group ensures effective Learning.	4.15	92.32	7.69
	Combined Mean	3.49		

Teachers' Attitude towards Cooperative Learning

In sections 4.2 through 4.6, the results from the questionnaires for teachers and students along with interview results of teachers were presented. All the items in the questionnaires were measured on a five-point Likert scale ranging from 1-strongly disagree to 5-strongly agree. While computing means, the reverse scoring for negatively worded items was employed. Furthermore, aggregate percentage of those who responded agree (4) or strongly agree (5) for an item has been considered and categorized as "SA or A". Similarly, for those who responded disagree (2) or strongly disagree (1) for an item the aggregate percentage has been computed and it is categorized as "SD or D". This was done to facilitate readers' understanding of the findings of the study.

Table 2 clearly shows that teachers in the three schools possess favorable attitude towards CL as evidenced by the aggregate mean (3.49 > 3). Most of them recognized that CL is a valuable instructional approach (84.62%) and they believe that active learning can also be deliberated in large classes (69.23%). They also claimed that CL has positive contribution to promote students' academic achievement (84.62%). Respondents understood the role of positive interdependence among group members in ensuring effective learning (92.32). On the other hand, respondents reported that they were skeptical about students' interest to actively take part in classes (69.23%). Furthermore, they have too little experience in teaching for successful implementation of CL (76.92%). This signals that the implementation CL was not actualized up to the expected level.

Analysis of Students' Attitude towards Cooperative Learning

In Table 3, items such as 'cooperative learning would affect my work and my friendship' (80.06 %), 'I have no confidence in my abilities when I work in cooperative manner' (80.74 %), 'creativity is not facilitated in the group setting' (73.65%) and 'I don't believe in student team learning' (65.2%) indicated that students were not in favor of CL events. Even though most of the students responded that they like working in groups in their mathematics class (70.95 %), the computed aggregate mean (2.52) on students' attitude towards CL was not favourable. The findings were supported

by the open ended items explanation and interview sessions. For example, one of the teachers in an interview explained, "Students' attitudes were depending on teachers' activity on the practice of CL. To me, students have no favorable attitude toward CL groups". According to Chui (2004) most of students who come to school expecting the conventional classroom arrangement are confused and hesitated when their expectations does not met. So, it can be concluded that students may have negative attitude towards CL due to lack of familiarity with variety mode of CL groups.

Analysis of Students' Response of Teachers Practice on Cooperative Learning

Table 4 illustrates the extent to which teachers provided students with opportunities for cooperative learning in their mathematics classes.

The results in Table 4 show that most of the respondents replied that teachers did not give chance for student participation (67.23%), did not motivate students to learn cooperatively (83.79%), did not take a facilitating role while implementing CL (75.34%), did not employ team learning techniques (64.18%), did not give a chance for reflection (71.29%), did not give enough time to learn together in classroom (84.8%), and did not inform students how they can learn cooperatively (76.01%). Overall, the results for each item and the aggregate mean (2.46) indicate the implementation of cooperative learning in the three schools was not encouraging.

In order to supplement the data obtained from students regarding the implementation of cooperative learning, an interview was conducted with teachers. Teachers were asked how they feel on the practice of cooperative learning. In response to this, one of the teachers explained that:

> The implementation of cooperative learning in the school in which I am teaching is very low. In my observation, the implementation of cooperative learning requires adequate training, workshops; inter-school and intra-school experience sharing and the like. However, teachers did not have access to the above mentioned opportunities so far. As many of the teachers are overloaded with classes and organization of co-curricular activities of the schools, they did not have time to come together and share experiences.

According to Liang (2002), to make cooperative learning well implemented in classrooms, teachers require prior training to obtain professional competence of cooperative learning. Thus, the data that were collected on the implementation of CL from students and teachers indicated that teachers were not practicing CL to the level they are expected to perform well.

Analysis of the Major Factors that Debilitate the Implementation of CL Methods in Classroom

In order to investigate these factors, questionnaires were presented to mathematics teachers and students. Table 5 and 6 present the results obtained.

Table 5 reveals that the factors that debilitate the implementation of CL found to be shortage of time, lack of administrative support, lack of familiarity with CL methods and lack of teaching facilities. From this, it can be concluded that attention is required on the part of school administration in fulfilling the necessary administrative supports.

The results in Table 6 show that most of the respondents identified shortage of time to implement CL (88.51), lack of administrative support (72.97%), lack of familiarity with CL (77.36%), lack of resource materials (84.12%), lack of classroom space (85.14%) and unsuitable classroom environment (74.32%) as major factors that debilitate the implementation of CL. Similarly, students' responses in the open-ended items explained that the major factors that debilitate the implementation of CL method in classroom practice were paucity of resource materials, lack of administrative support, classroom space, time and other necessary services for

Table 3. Analysis of students' attitude towards cooperative learning

No.	Items	Mean	SA /A (%)	SD /D (%)
1.	I believe in student team learning	2.64	34.80	65.20
2.	I like to work in groups	3.68	70.95	27.37
3.	Creativity is facilitated in the group setting	2.45	25.34	73.65
4.	CL would affect my work and my friendship	2.16	80.06	19.94
5.	I have no confidence in CL group.	1.69	80.74	11.49
	Combined Mean	2.52		

Table 4. Analysis of teachers practice in cooperative learning

No.	Items	Mean	SA /A (%)	SD /D (%)
1.	Our teachers give us a chance for group participation to understand mathematics easily.	2.60	32.10	67.23
2.	Our teachers motivate us to learn cooperatively	2.06	16.22	83.79
3.	When cooperative learning is implemented, teachers take a facilitating role	2.12	21.96	75.34
4.	Teachers employ student team learning to improve our relationship.	2.57	35.13	64.18
5.	Teachers do not give us a chance to reflect what we discussed in our group.	2.38	71.29	27.71
6.	Our teachers give us enough time to learn together in classroom.	1.81	12.16	84.8
7.	Cooperative teams are formed based on our seats.	3.80	13.85	85.81
8.	Our teachers advise us how we can learn cooperatively.	2.36	22.3	76.01
	Combined Mean	2.46		

Table 5. Major factors that incapacitate the implementation of CL methods (teachers)

No.	Items	Mean	SA/A (%)	SD/D (%)
1.	Lack of enough time to implement CL in mathematics class.	3.62	76.93	23.07
2.	Inadequate administrative support to implement student learning.	3.85	84.62	15.38
3.	Lacks of familiarity with CL methods make impossible to implement.	3.77	69.23	23.07
4.	Lack of teaching facilities affects CL groups.	3.62	76.92	23.07

Table 6. Major factors that debilitate the implementation of CL methods (students)

No.	Items	Mean	SA/A (%)	SD/D (%)
1.	Lack of enough time to implement CL in mathematics class.	3.94	88.51	11.49
2.	Inadequate administrative support to implement student team learning.	3.49	72.97	26.01
3.	Lacks of familiarity with CL methods make impossible to implement.	3.77	77.36	21.96
4.	Lack of teaching facilities.	3.99	84.12	15.20
5.	Lack of classroom space.	4.11	85.14	13.85
6.	There is suitable classroom environment.	2.38	24.32	74.32

students and teachers. The classroom observation scenario also showed that classroom conditions were not supportive for CL and there was no enough space for materializing CL groups in the classrooms.

Song (2012) substantiating the above findings explained that CL groups should be provided with enough time for the students to function as a team where they learn more, cooperate with, and learn from one another. Without adequate time and proper facilities, students may become frustrated and not function as a team.

Analysis of Possible Ways for the Implementation of CL in Mathematics

Table 7 indicates that majority of the respondents fall under the category of either disagree or strongly disagree across all items. Most of the respondents did not receive training on implementation of CL, did not encourage students to involve in team learning, did not apply student team achievement division method, did not arrange students in groups for team work and did not implement active learning methods in general. This means teachers were not willing or trained to exercises effective way of implementing CL.

Table 7. Analysis of possible ways for the implementation of CL

No.	Items	Mean	SA or A (%)	SD or D (%)
1.	Receiving training on the cooperative learning in mathematics teaching.	2.54	23.07	76.92
2.	Encouraging students to use team learning.	2.46	23.07	76.92
3.	Establishing student team achievement division method in mathematics class.	2.46	23.07	69.23
4.	Arranging students into groups for mathematics team work.	2.23	30.76	69.23
5.	Implementing active learning.	2.08	23.07	76.92

From open ended item, teachers argued that CL takes much time and effort, they boldly suggested the method of giving explanation followed by assignment and test is more preferable ways to save time and efforts. Similarly, in classroom observation, most teachers have given great emphasis to lecture method than student-centered method. This indicated that teachers do not consider important elements of cooperative learning.

According to Slavin (2006) cooperative learning comprises instructional methods in which teachers organize students into small groups to work together to help one another learn academic contents. However, most teachers were not doing this. The problem may arise from lack of instructional facilities and absence of exchange of ideas among mathematics teachers that may negatively affect the efficiency of the teachers to implement the methods of CL groups in the three schools.

CONCLUSIONS AND IMPLICATIONS

The findings of the study revealed that respondents did not practice CL in the actual classrooms, although they have favorable attitudes. The study indicates that though teachers did not implement cooperative learning, their attitude towards cooperative learning was not aversive. With regard to the attitude of students towards CL, the findings of the study revealed that, they have no favorable attitude at all. The findings show that there were specific factors that influence the implementation of CL methods in classroom practice. From teachers and students' responses, shortage of time, lack of resource materials, lack of administrative support, lack of classroom space, lack of familiarity with CL methods and classroom environment were identified as major factors that influence the implementation of CL method in classroom.

The results of the study also show that teachers did not apply the essential elements of CL. Teachers did not take prior training on the issue. From this, it can be concluded the inadequacy of training on CL among mathematics teachers negatively affected teachers endeavor to implement CL in the sample schools. Pertaining to classroom conditions

(availability and arrangement of seats), the results of the study showed that classrooms of the selected sample schools were not supportive for CL implementation. It was found there were enough seats, they were placed arbitrarily. Therefore, it can be concluded that teachers did not arrange seats in the way suitable to practice CL. This practice inhibited teachers to successfully employ CL implementation.

Based on the findings of the study, the researchers forward suggestion for the improvement of the practices of CL. Accordingly, teachers should be aware of the impact of classroom conditions and grouping mechanisms on students' meaningful learning. Implementation of CL has been found low and students' practice to interact with one another is a neglected aspect of instruction. Accordingly, researchers believe that unless teachers get training, it is a challenge for them to equip themselves with the necessary assumptions of CL to carry on effectively. Therefore, adequate training time should be devoted to acquaint teachers on how and when to effectively implement CL groups in the classroom instructions. Teachers should get access to long term and short term support and learn from one another. A new scheme of continuous professional development and higher diploma program that focused on improving teachers' practices and skills of teaching methods need to be put in place.

Moreover, adequate resources, classroom space, time and administrative support are required. Therefore, school community predominantly principals, education bureau heads and teachers should play a role to support students and replace the traditional arrangement of furniture to fit to effective implementation of CL. The focus of this paper was on investigating teachers and students' attitude, possible ways, major factors and practice of cooperative learning. Thus, future research should be undertaken with regard to the factors that affect the implementation of cooperative learning in time and space with wider scope and magnitudes.

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