

**THE EFFECT OF LEARNING TOGETHER TECHNIQUE OF COOPERATIVE
LEARNING METHOD ON STUDENT ACHIEVEMENT IN MATHEMATICS
TEACHING 7TH CLASS OF PRIMARY SCHOOL
“İŞBİRLİKLİ ÖĞRENME” YÖNTEMİNİN İLKÖĞRETİM 7.SINIF MATEMATİK
ÖĞRETİMİNDE ÖĞRENCİ BAŞARISI ÜZERİNE ETKİSİ**

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ABSTRACT:

The purpose of this study is to determine the effect of learning together technique of cooperative learning method on student' mathematics achievement. The study was an experimental research in which pre-test – post-test design with control group was applied. The study was conducted in spring 2004 with 70 pupils studying at 7th class in Balıkesir, Turkey. In this study, experiment and control groups have been used. *Learning Together* technique of *Cooperative Learning* method has been applied to the experiment group and *Traditional Teaching* method has been applied to the control group. Before applying the measure means is given to groups as pre-test. In the end of applying is practised post-test to groups. Conclusions showed that there is a significant difference between the results of experiment and control groups. Learning Together technique of cooperative learning method is more effective than traditional teaching methods.

KEY WORDS: Cooperative Learning, Learning Together, Mathematics Learning.

1. INTRODUCTION

In the recent years, cooperative learning method, which attracts the attention of many educators, constitutes an alternative to the traditional learning methods. According to Açıkgöz (1992), cooperative learning is a process in which students learn by working in small groups and helping each other's learning for a common aim. Since cooperative learning is a group working, it is similar to the set working method. But every group working is not cooperative learning. A group working becomes cooperative learning if every member of the group knows that he or she can't be successful unless the other members are successful.

According to Deutsh (1949); the effort of a student to reach his goal has,

- a) a supportive effect in the cooperative case,
 - b) a obstructive effect in the competitive case,
 - c) a neutral effect in the individualistic case.
- on the other students.

According to D.W. Johnson and R.T. Johnson (1991a), in order to construct a lesson with cooperative method, five basic principles must be provided.

1. positive interdependence,
2. face-to-face primitive interaction,
3. individual accountability,
4. the appropriate use of social skills,
5. processing how well the group is functioning,

Cooperative learning method includes many techniques. Some of these are;

- Learning together,
- Teams-games-tournaments,
- Group investigation,
- Constructive controversy,
- Jigsaw producers,

In this study learning together technique from cooperative learning method was used because the lesson could best be constructed by this method when the subject of angles and triangles were being taught.

The learning together method is a technique developed by D.W. Johnson and R.T. Johnson (1991b). The most important properties of this technique are the existence of the group goal and sharing the opinion and materials, division of labour and the group reward. According to Johnson and Johnson, the first applications

that was done, they developed. When learning together technique is applied the following options must be given place:

- 1- Determining of instructional objectives,
- 2- Deciding the group size,
- 3- Diving the students into groups,
- 4- Arranging of the class,
- 5- Planning of educational materials to provide dependence,
- 6- Giving the roles to the group members in order to provide dependence,
- 7- Explaining of the academic work,
- 8- Creating the positive objective dependence,
- 9- Individual evaluation,
- 10- Providing the cooperation among the groups,
- 11- Being explained the criterions necessary for achievement,
- 12- Determining the required behaviours for success,
- 13- Guiding the student behaviours,
- 14- Helping to the group work,
- 15- Having students come together for being to able to teach cooperation,
- 16- Finishing the lesson,
- 17- Evaluation for students learning qualitative and quantitative,
- 18- Evaluating the performance of the group,
- 19- Forming academic contrasts.

1.1. The Aim and Importance of the Research

The purpose of this study is to determine the effect of learning together technique of cooperative learning method on student' mathematics achievement.

Mathematics classes are thought be difficult and always make students afraid because of the insufficiencies on the education system and teach and many difficulties are faced in the application (D.W. Johnson & R.T. Johnson, 1991a).

Therefore, cooperative learning method, which can be used in every area and every level of the developed countries, can fill this emptiness in the education system.

Conclusions of this study are expected to;

- 1- be useful for maths teachers while they are planning the process of teaching-learning,
- 2- bring the variety to the methods and techniques used in the process of teaching-learning,
- 3- create new discussions and researches concerning the methods and techniques used in maths teaching of primary school.
- 4- contribute to the curriculum of the education faculties,
- 5- make suggestions that will be useful for the improvement of the curriculum of maths lesson of primary school.

2. METHOD

The study is an experimental research in which pre test-post test design with control group has been used.

2.1 Subjects

Participants were 70 seventh-grade pupils who were taught by the same Maths teacher in Mehmetçik Primary School in Balıkesir in Turkey in March 2004. Most children came from middle-class families. Approximately 40% of the children were girls. (As sex did not affect any of the dependent variables under any conditions, it will not be discussed further.) The experiment has lasted for five weeks.

After meeting school director and authorities, the most experienced and willing mathematics teacher in Mehmetçik Primary School was chosen. 7-B and 7-D Classes to which this teacher taught were chosen as sample.

For the rrrch seventh-grade pupils were selected. Primary school is preparation to high school. Mathematics teaching that is effectively given provides fundamental for high school and university education. This strong fundamental provides to be permanent learning and high achievement to pupils. To increase the low success

level in primary school it is necessary that the contemporary methods are tried and explained their effects in the atmosphere of teaching and learning.

Experiment and control groups were randomly assigned. 7-B Class was determined as experiment group and 7-D Class as control group.

Table 1. Subject's Dispersion

Group	Method	N
Experiment	Learning Together technique of Cooperative Learning	36
Control	Traditional Teaching	34
Total	2	70

Since it is wanted to be determined how learning together technique of cooperative learning method will affect the pupil achievement by this research, equalization was tried to be provided between experiment and control groups.

2.2 Equalizing

On equalizing, students' autumn term points, spring term first exam points and the equating test were used.

Table 2. Mean of the student's autumn term scores

Group	N	M	Sd	T	P
Experiment	36	3.02	1.52	0.05	>0.05
Control	34	3.00	1.47		

Table 2, no significant difference was found between classes on the students's autumn term scores.

Table 3. Mean of the student's spring term the first exam scores

Group	N	M	Sd	T	P
Experiment	36	2.88	1.47	0.09	>0.05
Control	34	2.85	1.42		

Table 3, no significant difference was found between classes on the student's spring term the first exam scores.

Table 4. The equating test

Group	N	M	Sd	T	P
Experiment	36	2.36	1.10	0.03	>0.05
Control	34	2.32	1.15		

The KR-20 coefficient of 0.82 was considered a highly acceptable indicator of the reliability of this test. Table 4, no significant difference was found between classes on the equating test.

2.3 Process

When preparing the data collection tools, getting permission from Balikesir National Education Management and determining the experiment and control groups has been completed. Both groups have been told that they have been selected the subjects of an experimental research to examine the effect of cooperative learning methods on student's mathematics achievement. By this explanation, it has been aimed to motivate students positively for the research. By considering the main principles of cooperative learning method, the lesson plans have been prepared with respect to learning together technique of cooperative learning and traditional learning. Obeying these has done instruction. In the research this way has been followed:

- 1- Application of pre-test.
- 2- Getting experiment and control groups constituted,

3- Application of learning methods determined at groups,

a) Traditional method has been applied to the control group.

b) Before cooperative learning method has been applied to the experiment group, it has been thought that the group size would consist of 4 students. At first, the class has been separated to groups consisting of 4 students. While constituting these groups, it has been paid attention that groups were homogeneous. These homogeneous groups have been constituted by considering the students' autumn term scores, their spring term the first exam scores, and their scores of the equating test, their behaviour inside the class, their social abilities and sexes. After separating the students to groups, it has been explained them that they would learn maths lesson with their own groups and their work didn't matter without their groups.

The classrooms in Turkey are in classic style. Since this case didn't enable cooperative working, the lessons were done at the art workshop of Mehmetçik Primary School. Groups were told to find a group name. Then all the class was introduced the role of every group members and handed "The Role Cards" out to every group. Every group has been shared these roles. Then the groups have been given "The task sheet". The groups were told to make a house plan with the certain rules in which 4 people would live during 100 days like "Somebody Watching Over You" published on TV. The groups didn't take the help from anybody else by preparing their house plans. Their teacher made the required explanations. After the groups had prepared their house plans, "Work Sheet 1" [Appendix 1] and "Work Sheet 2" [Appendix 2] were given to them. After they completed the work sheets, "Observation Sheet", "My Checklist for Cooperative Groups" and "Group Processes" have been given to them. Then, the house plans and all the given work sheets were collected from the groups. After they finished their works, every group has presented their house plan to the class. After the presentations finished, every group was found successful. Therefore everybody has been given "Achievement Certificate".

4-Being applied of post-test.

The mentioned processes had been realised between February 24 and March 25 in 2004.

3.FINDINGS

Evidence to support the reliability of the achievement test was obtained for the pre-test results of both classroom combined. The KR-20 coefficient of 0.84 was considered a highly acceptable indicator of the reliability of this test. Table 5, no significant difference was found between classes on the pre-test scores.

Table 5. Pre-test Mathematics Mean Scores

Group	N	M	Sd	T	P
Experiment	36	2.42	1.10	0.01	>0.05
Control	34	2.41	1.05		

Evidence to support the reliability of the achievement test was obtained for the post-test results of both classroom combined. The KR-20 coefficient of 0.86 was considered a highly acceptable indicator of the reliability of this test. Table 6, significant difference was found between classes on the post-test scores.

Table 6. Post-test Mathematics Mean Scores

Group	N	M	Sd	T	P
Experiment	36	3.53	0.19	2.53	>0.05
Control	34	2.82	0.21		

Table 7, whereas neither groups was significantly different ($p>0.05$) from the other on the pre-test, the experiment (cooperative) group obtained significantly ($p<0.05$) higher achievement on the post test than the control (traditional) group. It should be noted that both groups demonstrated significant ($p<0.05$) gains from pre-to post-test:

Thus, our hypothesis, which was based on Johnson and Johnson's (2000) earlier meta-analysis, was confirmed.

Table 7. The Means of Pre-test and Post-test Results of Experimental and Control Groups

Group	Test	N	M	Sd	Differences between the mean of Pre-test and Post-test	Differences of mean scores	p
Experiment	Pre-test	36	2.42	1.10	1.11	0.70	<0.05
	Post-test	36	3.53	0.19			
Control	Pre-test	34	2.41	1.05	0.41		
	Post-test	34	2.82	0.21			

4. RESULTS AND DISCUSSIONS

In this part, there are the results and discussions reached by means of findings obtained in the research done for testing the effects of cooperative learning method and traditional learning method on the pupil's achievement in maths teaching of primary school 7th class.

According to the results, in this research;

- 1- It was observed that learning together technique of cooperative learning method is more effective than traditional method in maths teaching of primary school 7th class.
- 2- It was noticed that the level “which is concerned with improvement his achievement in maths” of the students in the experiment group “in which learning together technique of cooperative learning method is applied” is higher than the level of the students in the control group “in which traditional teaching method is applied”.

With the help of conclusions obtained in the research, it is reached the result that learning together technique is more effective than traditional teaching method in maths teaching. In learning together technique of cooperative learning method, the students permanently connects with each other and their teachers for learning and teaching, whereas in traditional teaching method, there is an atmosphere that the connection is less and the teachers is at the center.

In cooperative learning, the students explain their opinions; present the alternative strategies and approximations that help them to understand maths concepts. When the students explain, transfer and question, their opinions, they are peachier in traditional class atmosphere. By studying cooperative the students gain self-confidence. The students more commonly stilize their agnostic sourcles within the cooperative group. In cooperative groups, they understand more by using maths language in the process of deciding with their friends. By understanding the logic drive strategies and problem analysis to their group friends they discover the content and drive the logic. Explaining their opinions and the ways of solving problems to their group friends and teachers, provide more aids to student when compared to traditional method. When the one of students teach, the others control themselves, the misunderstandings are explained, maths rules are understood, and the errors occurred in the application are corrected. Namely, cooperative learning method is a strong base for learning. In cooperative learning method, the students learn driving logic mathematically, sharing their opinions with the others, and using maths for solving the problems. During the research most of the students wanted to use cooperative learning method at the other lessons too. In the maths teaching, cooperative learning method is a good choice for learning effectively.

In the light of conclusions obtained in this research and results reached, the following suggestions are presented:

- 1- Cooperative learning method should be used in maths teaching at the level of primary school, high school and collage.

- 2- Taking results more successful when compared to traditional teaching method cooperative learning method and its techniques should be put in the curriculum and taught at the lesson of “special teaching methods” in the Education Faculties.
- 3- Maths laboratory should be designed for to use cooperative learning method in maths teaching at all process of education. These laboratories should be designed in the way of providing the groups’ peacefully.
- 4- In maths teaching, before beginning cooperative learning, students should understand to study by devising cooperative groups at the activities out of the lesson.
- 5- The conferences and seminars about cooperative learning method and teaching are introduced to the teachers should be made.
- 6- The more comprehensive researches with long period should be done with respect to determine the effect of cooperative learning method to maths teaching.
- 7- The comprehensive projects in which the experts in maths teaching and experienced maths teachers participate should be done in order to be improve maths teaching.

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