# COOPERATIVE APPROACH TO LEARNING IN MATHEMATICS 

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Original scientific paper

Received: 10.02.2016
UDC:371.311.4:51
Accepted: 11.03.2016
37.016:51


#### Abstract

A cooperative approach to learning in math class, and especially the fear ofmathematics are the actuality of contemporary class. That would be the subject of much loved depends on the teacher or the methods applied in the process ofrealization of teaching units. The fact is that students often declare how do not like math and choose high school and colleges where there is a minimum of mathematics. Their thinking is a product of the experience with the teacher andthe curriculum in the starting teaching mathematics. In this paper, the statistically significant differences between the written co-operative learning access and success of students in relation to the traditional classes.


Keywords: Cooperative, teaching, learning

## INTRODUCTION

And in the 21 st century people are saying that mathematics is a very difficult subject, although they are not aware that the least educated people in the everyday life use mathematics, for example, trade, land measurement. The fact is that older transmit that opinion to the younger population, and because children in teaching mathematics say that they do not like the subject, although I do not bother to invest their full potential. Mathematics is abstract as the subject compared to other subjects, but not incomprehensible. Also, in order to come to love the subject and partly depends of the teacher who teaches. Therefore, we would like to explore the relationship of a new approach to studying mathematics and reach results that show whether there is improvement in the under-
standing of different subjects and creating a desire for learning mathematical concepts.

## Cooperative learning in mathematics

Despite the fact that today's children are more versatile, more capable and smarter, their mathematical knowledge all the worse, and studies show that learning mathematics solely because of grades. Today, all the more difficult modernization, discusses the teaching of, and in fact in our schools teaching mostly held in the traditional way. In traditional classes are represented by lower forms of learning in them is an active student at the level of reproduction, and the nature of the child prefer active teaching.

[^0]The use of cooperative learning is just one of the ways of modernization of teaching. Model in teaching significantly affects the results of students, because if teachers continue to communicate with students, there is a strong possibility that they will adopt a mathematical communication. If we solve mathematical problems, encourage them to think, we teach them to sketch, model, probably they will all try to apply these skills in everyday life, because their skills are in large part a reflection of teaching. These facts confirm the influence of school on the child's life, a way of thinking, the construction of attitude about the world in which he lives, because that's the job of school. In addition to learning to enable students to acquire knowledge of individual research, and when they get that will force teachers and the application of modern methods of work. Since modern education requires the application of different methods, teaching materials, forms and methods of work, and in the teaching of mathematics that suggests experiential learning and teaching, which contributes to the development of students' thinking, the way of finding information, their critical observations, assessments and using them, and how to think independently and to comply with its decisions, way of thinking

## Models of organization of cooperative learning

Working in pairs and small groups (groups) are the most common forms of social work in the function of presenting cooperative learning. In the opinion of Ladislav Bognar (2006). Particularly important fact is the emergence of creativity in collaborative learning. Group work provides thoughtful exchanges that promote understanding and encourage students to collaborate and learn to work in groups.
As the term itself says pair work is this kind of work in which two students perform a given task. If cou-
ples by attitudes and traits complementary pair can be achieved and unity, and on the contrary a couple break up, if one partner is not willing to cooperate. The use of this type of work motivates students (internal motivation), allows the withdrawn students to engage in work, increased interest in learning, developing the love, attention, friendship, formed their own opinions, interests, nurture collaborative relationships, and the students get to know better their own identity and strengthen the awareness to work together to achieve better results. "There are more ways to work in pairs. Stevanovic (1998) states the following work models: instructive work, co-operative learning, individual learning in pairs, creative work in pairs, mutual evaluation, evaluation, research in tandem, etc.
We will briefly say something about the model number 2. The joint (cooperative) learning. It should be noted that this model work in pairs can be applied at all stages of teaching: preparative, operational, verificative and applicative.
In the first phase preparative couple agreed on the organization of work and learning, and allowed them the teacher's help if there is a need for it.
The operational phase is the phase of learning new, but previously learned and training facilities. At this stage the couple is working on the text, reading and writing, listening, observing, talking, etc.
Verificative phase of the vases in which the partners are evaluating each other or self-evaluative.
Last, the application is the phase in which are analyzed the possibilities for the application of acquired knowledge in practice.
The current practice in the classroom showed that students despite having sat in groups, do not cooperate and work as a team on their schoolwork. The work is individual, which is due to the teachers' setting the tasks to students. The following figures represent ways of group work in our schools.



$$
a, b, c, d-\text { tasks }
$$

Figure 1. Individual solving various tasks

In Figure 1, the students work in groups, where each student works individually on their task.


Figure 2. Individual solve the same tasks

Figure 2 shows a very common situation in our schools, where pupils are divided in groups and individually solve problems.
In both the case of missing collaboration among students, and therefore there is no cooperative learning. In mathematics teaching this happens often. Students solve individual worksheets. Therefore, not enough students split into groups and expect a successful operation, it is necessary to initiate the interaction between them. "Cooperative learning has its authentic features, so the following teaching situations are not and can not be classified as collaborative learning: teaching situation in which students work individually at the same table in the same or different tasks;teaching situation in which students work on individual tasks, and thereby betterstudents help the weaker students; teaching situation in which one student does everything, and the other membersof the group are bystanders, and mostly rely on the work of active students; teaching situations of group work in which the teacher often almost entirely managed by
students' work and gives a very direct instruction to work and where there is no true student collaboration; teaching situation where students have not developed social skills and effective communication are open and in which there is no true exchange of student opinions and ideas, and vision problems, and agreeing on which student groups work; teaching situation in which students work as a team, but they know that the teacher evaluate their work individually (it is a so-called. Pseudoskupnom work) "(Kadum-Bosniak, 2012).

To avoid these situations where teaching is not running a true learning process and which is usually that knowledge mechanically adopted (without understanding) with a low degree of functionality, the teachers have set up such an organization in the classroom to encourage student interaction with the goal of mutual cooperation. Boost that could be the introduction of user groups. Therefore, we will mention a few ways of organizing students or models of collaborative groups in mathematics.


Figure 3. The students work independently on parts of the task to come up with common solutions

In this type of collaborative group task is divided into as many parts as there are students in the group. The task will be solved only when all students successfully solve their individual tasks, which are then combined into "puzzle". Kadum-Bosniak (2012) points out that
co-operation in this type of group in the task and responsibility of each member of the group (students).
He says that the other type of group "Group research" or "Model mutual release".


Figure 4. students collaborate on a mission in order to reach common solutions

In this kind of group of students must cooperate with each other and their work must be coordinated, in order to solve a given task.
In addition to the above model of organizational structure of cooperative learning, in the literature we find the following models:
Thepyramid model - in the mode we mean multiple layers of group work in terms of students' communication, but also the level at which the realized cooperation. It includes three levels of student cooperation. The first is the cooperation of student pairs, they may forgo individual work, and to cooperation at the level of the group .
Spherical model - this model is similar to an F above, and differ in that, with this in this model task exclusively with divided into two parts, where the first phase of work on the job working in mended which doubles, and the second phase switching to group work. As we see that it is actually applied to the Principle of "puzzle".
Model octopus - a model that focuses on the mended cooperation at you with their levels. At the level of groups or entire departments. It is alleged that this model is very suitable for processing but speaks them thematic, but also in consideration of certain tasks or concepts with you aspects.
The choice of ways of structuring work during cooperative learning depends on the teacher, or the type of lesson, and the teacher's assessment of the effective-
ness of a particular model for a particular teaching materials. Properly selected and placed the structure of work has a positive effect on raising pupils' concentration on the development of communication skills, focus on the task, and therefore the better achievements.

## DISCUSSION

Ćatić \& Sarvan (2008) state that J. Stele with co-workers in his "Reading and Writing for Critical Thinking" provide a highly cooperative learning strategies that can be used in all stages of teaching. Here we will mention only those that can successfully implement the hours of mathematics.
Reciprocal teaching is done in groups of 4-7 students, and allows each student finds himself in the role of teachers and other leading members of the group through the text.All students have the same text and alternate in the role of teachers who are required to complete five tasks, after all group members to read the resulting text itself. The student in the role of teachers shall: summarize what is read, think of a few question about deciphered section and get answers from other members of the group, clarify the issue in relation to which other students are not sure, anticipate action next section, specify anyone to read the next paragraph and call the next student who takes on the role of teachers.

Think, exchange, match - a strategy that can be repeated several times during the hour, and enables rapid activity of cooperative learning. Requires students to think about the task and that their friends are helping to shape ideas. Students give answers to questions that the teacher is prepared in advance. After that are shared in pairs, sharing answers, trying to get the best solution by working together.
Puzzle - cooperation is reflected in the fact that members of a collaborative group to become experts in a particular field of the given topic. The class is divided into groups (parent group), and the topic being studied is divided into 4 parts. Within the group of students are divided eg. The numbers (units, twins, triplets, quadruplets). All students receive some part of the task or text, and then all of the students assigned to the same numbers they move to a group called the expert group. Work together on the same part of the task, and become experts in that section. The expert group examines its subtopic and plans on how to transfer and teach members of parent groups to important information of this part. Upon completion of the work of the expert group members are returning home groups and teach other students, whose duty is to write down all the questions that have to do with any part of the text. Written questions should be referred to an expert group responsible for that part. Think in pairs, exchange - a quick and simple technique of cooperative learning, which can be applied to much of the content. Before students can put the problem on which individual thinking, and then the pair exchange their views. This model is great for conversation starters.
Round and round - the collaborative activity in which a piece of paper and a pencil are sent by the member. One student wrote down an idea and sends the student to the left or right side. The student writes something and pass along their paper on the same side. This model can be applied orally.
Brainstorming (brainstorming) the techniques of creative thinking that is used to create a large number of ideas on the way to be counted and recorded the decision of a problem. Each student must strive to give you a number of proposals which can not criticize and do not reject, regardless of the feasibility and reasonableness. The next stages are used for checking all the answers, rejecting unacceptable and keeping good solutions.
Alex Osborne, the founder of this method defines brain storm as a method by which a group of people trying to find a solution to a specific problem by drawing up the list of spontaneous ideas. Its appli-
cation is found in education eg. Used in educational workshops when developing group projects, but can be effective in the individual work. Each brainstorming begins particular issue. Someone from the group writes down all the ideas. At this stage, the idea is not explained, and the goal is to stay positive all the time. Having exhausted all ideas, changes to the phase of evaluation, selection, criticism, etc. The good side of this technique is what drives a lot of energy, improves the atmosphere and relationships within the group, and therefore is also a lot of fun.
The tree is the future of cooperative learning methods with a lot of variations that can be combined with a brainstorm. On the same tree every student has a branch that was later added to the list (flowers) with ideas, suggestions, or some current problems, its consequences, as well as the solution.

## METHODS

Our study was conducted in three elementary schools: Elementary school in Busovaca Busovaca, elementary school Kaonik Kaonik and Dubravica school in Vitez in order to spot students reactions to the work of the group, checking how many pupils find it interesting mathematics presented in this way, how much has changed their participation in class in relation to the daily hours, whether they are looking for help from the other and helped each other, and whether they were interesting and that you would like to see these hours CECS held.
The research was done in sixth grade classes. In every department held a mathematics lesson cooperative method of learning with teaching unit square and rectangle. Students are divided into groups of 4 students in a way that in each group is an excellent student, two with an average grade and one with below average grade. One group was tasked to construct a rectangle given length, withdraw its diagonals, measured it and mark the intersection point, mark, measure and boils interior angles, brought the formula for the circumference of the rectangle, and then he and calculating. The second group had a square, and the tasks are the same, only it was to be applied to the square. Group work is organized so that each student has a task in order to avoid that only one student works, and since the exercises were linked to each other disciples had to cooperate with each other. While one member of the group worked and explained the procedure followed others, warned of mistakes, giving their ideas, but no one could solve the task that belonged to another student.

The tasks are complex from easier to more difficult, were the appropriate students abilities, so that they were all equal and are actively involved in the realization of the hour.
After the task, the students were given surveys that were filled out anonymously to as honestly answer the questions asked.
So the problem of cooperative learning would be the ratio of cooperative learning and motivation of students in mathematics during the processing of the new teaching material. We would see the advantages and disadvantages of cooperative learning, as well as the fear of failure of students in math class, and the impact of poor motivation to learn, study and work.
The research topic was the impact of cooperative learn-
ing methods to better understand the subject matter and create a positive attitude towards mathematics.
We believe that there is a statistically significant association of cooperative learning in relation to the adoption of the new material from the teaching of mathematics.

## The sample

The study involved three primary schools, primary school Busovaca(blue), Primary Kaonik(red) and Dubravica(white color) Elementary School. The research was done in sixth grade classes. In elementary school Busovaca interviewed 57 students in elementary school Kaonik 21 students in elementary school Dubravica 49 students. Thus, a total of 127 students were surveyed.

## RESEARCH RESULTS



Graph 1. The relationship is math

The majority of respondents Primary Busovaca and elementary school Dubravica loves math, and most primary pupils Kaonik agrees with this statement. A small number of the surveyed students in all three schools do not like math, and almost an equal number of students is indifferent.

Respondents in elementary school Busovaca responded:

- Strongly Disagree ( 8.80 \% )
- Tend to disagree ( $30.5 \%$ )
- I'm not sure ( $28.10 \%$ )
- Generally agree ( 19:30 \% )
- I agree completely ( $38.60 \%$ )

Respondents in elementary school Kaonik responded:

- Strongly Disagree ( 4.80 \% )
- Mostly disagree ( 4.80 \% )
- I'm not sure ( $28.60 \%$ )
- Generally agree ( 52.40 \% )
- I agree completely ( $9.50 \%$ )

Respondents in Dubravica school responded:

- Strongly disagree ( 10.4 \% )
- Tend to disagree ( 10.6 \% )
- I'm not sure ( $26.50 \%$ )
- Generally agree ( 14.30 \% )
- I agree completely ( 49.00 \% )


Graph 2. Personal opinion of the respondents to the case

Pupils of Kaonik and Dubravica Elementary School are not sure if they are good at math, and the same number of primary school students and primary school Kaonik Busovaca is considered good in this case. Several respondents considered that are not good. If we look only answer number 5, we will notice that most primary pupils Busovaca considered excellent in mathematics.

Respondents in elementary school Busovaca responded:

- Strongly Disagree ( 7.00 \% )
- Mostly disagree ( $8.80 \%$ )
- I'm not sure ( $24.60 \%$ )
- Generally agree ( $33.30 \%$ )
- I agree completely ( $26.30 \%$ )

Respondents in elementary school Kaonik responded:

- Strongly Disagree ( 9.50 \% )
- Mostly disagree ( $9.50 \%$ )
- I'm not sure ( $42.90 \%$ )
- Generally agree ( 33.30 \% )
- I agree completely ( 4.80 \% )

Respondents in Dubravica school responded:

- Strongly Disagree ( 2.00 \% )
- Mostly disagree ( $20.40 \%$ )
- I'm not sure ( $40.80 \%$ )
- Generally agree ( $18: 40$ \% )
- I agree completely ( $18: 40 \%$ )


Graph 3. The objective of the adoption of mathematical knowledge

Results show the awareness of students about the importance of mathematical knowledge for the development of other abilities and skills, only a small number of mainly disagrees with this statement, and some are undecided.

Respondents in elementary school Busovaca responded:

- Strongly Disagree ( 0.00\% )
- Mostly disagree ( $1.80 \%$ )
- I'm not sure ( 19:30 \% )
- Generally agree ( $26.30 \%$ )
- I agree completely ( $52.60 \%$ )

Respondents in elementary school Kaonik responded:

- Strongly Disagree ( $0.00 \%$ )
- Mostly disagree ( 4.80 \% )
- I'm not sure ( 9.50 \% )
- Generally agree ( 33.30 \% )
- I agree completely ( 52.40 \% )

Respondents in Dubravica school responded:

- Strongly Disagree ( $0.00 \%$ )
- Mostly disagree (8.20 \% )
- I'm not sure ( 8.20 \% )
- Generally agree ( 20.10 \% )
- I agree completely ( $73.50 \%$ )


Graph 4. Application of acquired knowledge in new circumstances

A small number of primary pupils Busovaca can not get ready to apply the acquired knowledge and an equal number in all three schools is considered to be generally capable of applying the knowledge acquired. A similar number of respondents is indifferent, as well as fully capable to apply the acquired knowledge.

Respondents in elementary school Busovaca responded:

- Strongly Disagree ( 1.80 \% )
- Mostly disagree (7.00 \% )
- I'm not sure ( $19: 30$ \% )
- Generally agree ( $38.60 \%$ )
- I agree completely ( $33.30 \%$ )

Respondents in elementary school Kaonik responded:

- Strongly Disagree ( $0.00 \%$ )
- Mostly disagree (19.00\%)
- I'm not sure (19.00\%)
- Generally agree (42.90\%)

I agree completely (19.00\%)
Respondents in Dubravica school responded:

- Strongly Disagree ( $0.00 \%$ )
- Mostly disagree (4.10\%)
- I'm not sure(32.70\%)
- Generally agree (40.80\%)
- I agree completely (22:40\%)


Graph 5. Activity of respondents in math class

The students on this issue by a majority vote to confirm love to answer questions asked in math class, fewer of them are indifferent, and at least does not like the answer.

Respondents in elementary school Busovaca responded:

- Strongly Disagree (10:50\%)
- Mostly disagree (14.00\%)
- I'm not sure(22.80\%)
- Generally agree (19:30\%)
- I agree completely (33.30\%)

Respondents in elementary school Kaonik responded:

- Strongly Disagree (4.80\%)
- Mostly disagree (4.80\%)
- I'm not sure (28.60\%)
- Generally agree (23.80\%)
- I agree completely (38.10\%)

Respondents in Dubravica school responded:

- Strongly Disagree (8.20\%)
- Mostly disagree (14.30\%)
- I'm not sure(20.10\%)
- Generally agree (20.40\%)
- I agree completely (46.90\%)

I feel uncomfortable when I need to ask a question if you did not understand a lesson in mathematics


Graph 6. The attitude of respondents about the activities in class

Kaonik pupils of the freest in asking questions while the interviewed pupils of Busovaca to fully feel uncomfortable, and pupils of Dubravica generally feel uncomfortable asking questions if they did not understand the lesson. A large number of students are indifferent, with the most prominent pupils of Busovaca, and an almost equal number of students in all three schools will sometimes ask a question.

Respondents in elementary school Busovaca responded:

- Strongly Disagree (8.80\%)
- Mostly disagree (8.80\%)
- I'm not sure(28.10\%)
- Generally agree(24.60\%)
- I agree completely (29.80\%)

Table 1. Analysis of the results of students' attitude about math

| About MATHEMATICS |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| BR | 1 - generalwill | 2 - mostly | 3 - not | 4 - mostly | 5- is a |
|  | I reachdisagree | I do not agree | safe $/$ on | I agree | With the lie |
| First | $6.30 \%$ | $5.50 \%$ | $27.60 \%$ | $22.80 \%$ | $37.80 \%$ |
| 2nd | $5.50 \%$ | $13.40 \%$ | $33.90 \%$ | $27.60 \%$ | $19.70 \%$ |
| 3rd | $0,00 \%$ | $4.70 \%$ | $13.40 \%$ | $21.30 \%$ | $60.60 \%$ |
| 4th | $0.80 \%$ | $7.90 \%$ | $24.40 \%$ | $40.20 \%$ | $26.80 \%$ |
| Fifth | $8.70 \%$ | $12.60 \%$ | $18.90 \%$ | $20.50 \%$ | $39.40 \%$ |
| 6th | $16.50 \%$ | $8.70 \%$ | $22.00 \%$ | $26.00 \%$ | $26.80 \%$ |

Analyzing the results of students' attitude about
mathematics we came up with the following results. A small number of surveyed students $(30.6 \%)$ does not like mathematics, (5.50\%) generally agrees with this statement. This question is not safe ( $27.60 \%$ ) students, while $22.80 \%$ mainly loves $(27.60 \%)$ students, while $22.80 \%$ mainly loves
math. However, most of those students who like math $(37.80 \%)$.At least the students who feel that they are not good at math (5.50\%), and most do not trust $(33.90 \%)$. With this statement mainly disagreed $(13,40 \%)$ students, while $(27.60 \%)$ students who have very different opinions. (19.70\%) of respondents considered good mathematicians. The majority of respondents ( $60.60 \%$ ) is in full agreement that the mathematical knowledge is important for the development of other abilities and skills, $(21.30 \%)$ is generally safe in it, while $(13,40 \%)$

Respondents in elementary school Kaonik responded:

- Strongly Disagree (33.30\%)
- Mostly disagree (9.50\%)
- I'm not sure(9.50\%)
- Generally agree(23.80\%)
- I agree completely ( $23.80 \%$ )

Respondents in Dubravica school responded:

- Strongly Disagree (18:40\%)
- Mostly disagree (8.20\%)
- I'm not sure (20.40\%)
- Generally agree (28.60\%)
- I agree completely ( $24.50 \%$ )
indifferent. At least (4.70\%) students who generally do not agree with this statement, while not a single student does not doubt the importance of mathematical knowledge to develop other skills. At least students ( $0.80 \%$ ) were not able to apply previous knowledge in mathematics, and $(7.90 \%$ ) generally agrees with this statement. It is not certain $(24.40 \%)$ students, $(26.80 \%)$ is considered to be capable, and most of those surveyed are generally considered to be capable of applying current knowledge of mathematics (40.20\%).Students like to respond to the issues raised in math class as evidenced by the results of the study ( $39.40 \%$ ). $(20.50 \%)$ generally agrees with this statement. It is uncertain ( $18.90 \%$ ) of respondents. Questions does not like to answer ( $8.70 \%$ ) students, and ( $12.60 \%$ ) generally do not like to answer questions.

Most of the surveyed students feel uncomfortable when to ask a question if you did not understand the lesson (26.80\%). The greater part ( $26 \%$ ) generally agrees with discomfort about asking questions. Not
sure ( $22 \%$ ) of the surveyed students. (16:50\%) students is free to ask questions, and ( $8.70 \%$ ) mainly feel free to ask questions if you need, no matter what they did not understand the lesson.

Table 2. The average value per replies

| About mathematics | Arithmetical mean <br> (M) |
| :--- | :---: |
| 1. I like math. <br> 2. Good / ra at math. | 3.80 |
| 3. Mathematical cal knowledge are important for developing other abilities and <br> skills Stine. | 3.43 |
| 4th Capable / I understand the application of the current <br> Maths skills that would address / la problem. | $\mathbf{4 . 3 8}$ |
| 5th I love to answer questions posed in class mathematics. <br> 6th I feel CAM uncomfortable when I have to ask question if you did not <br> understand / la lesson mathematics. | 3.84 |

Judging by the results, average values, we see that the students considered that mathematical knowledge is important for the development of other abilities and skills $(M=4.38)$. More respondents are considered capable of applying current knowledge of mathematics to solve the problem ( $\mathrm{M}=$ 3.84), compared to the love of mathematics ( $\mathrm{M}=$ 3.80). Students like to respond to the issues raised
in math class $(\mathrm{M}=3.69)$ despite the small number of respondents considered good at math (M $=3.43$ ). The respondents are not inclined to ask questions if they did not understand the lesson which confirms the lowest mean value $(M=3.38)$. In conclusion, the respondents are aware of the importance of mathematical knowledge, regardless of the customer and love for the subject.

## The cooperative learning



Graph 7. The position of respondents on the work of the hour

All interviewed students responded positively to the implementation of a cooperative method of teaching hours as evidenced by the results obtained. A small number of students are indifferent, and very few of those surveyed supported the work of the group.

Respondents in elementary school Busovaca responded:

- Strongly Disagree (1.80\%)
- Mostly disagree (7.00 \% )
- I'm not sure ( 19:30 \% )
- Generally agree ( $38.60 \%$ )
- I agree completely ( $33.30 \%$ )

Respondents in elementary school Kaonik responded:

- Strongly Disagree( $0.00 \%$ )
- Mostly disagree (9.50\%)
- I'm not sure (14.30\%)
- Generally agree (14.30\%)
- I agree completely(61.90\%)

Respondents in Dubravica school building responded:

- Strongly Disagree(4.10\%)
- Mostly disagree (4.10\%)
- I'm not sure (8.20\%)
- Generally agree (14.30\%)
- I agree completely( $69.40 \%$ )


The majority of respondents in all three school sought help to explain part of the problem if it is not understood, an equal number of respondents remained indifferent, least of students did not ask.

Respondents in elementary school Busovaca responded:

- Strongly Disagree(3.50\%)
- Mostly disagree (3.50\%)
- I'm not sure(14.00\%)
- Generally agree (36.80\%)
- I agree completely(42.10\%)

Respondents in elementary school Kaonik responded:

- Strongly Disagree(4.80\%)
- Mostly disagree (4.80\%)
- I'm not sure(19.00\%)
- Generally agree (19.00\%)
- I agree completely(52.40\%)

Respondents in Dubravica school building responded:

- Strongly Disagree(6.10\%)
- Mostly disagree (2.00\%)
- I'm not sure(18:40\%)
- Generally agree (20.40\%)
- I agree completely(53.10\%)


Graph 9. Mutual assistance

The results show that the majority of primary pupils Busovaca and elementary school Dubravica answering questions in a group and most of those surveyed elementary school Kaonik generally agreed with that question. A small number of respondents Primary Busovaca remained indifferent, and during the hours he was not a student who did not answer the question. Even in elementary school Dubravica smaller number of students is indifferent, and at least those who have not answered the question. In elementary school Kaonik more students who did not respond to questions than those who are indifferent.
Respondents in elementary school Busovaca responded:

- Strongly Disagree(0.00\%)
- Mostly disagree (1.80\%)
- I'm not sure (26.30\%)
- Generally agree(24.60\%)
- I agree completely(47.40\%)

Respondents in elementary school Kaonik responded:

- Strongly Disagree(9.50\%)
- Mostly disagree (14.30\%)
- I'm not sure (9.50\%)
- Generally agree(42.90\%)
- I agree completely(23.80\%)

Respondents in Dubravica school building responded:

- Strongly Disagree(20.10\%)
- Mostly disagree (16:30\%)
- I'm not sure (22:40\%)
- Generally agree(16:30\%)
- I agree completely(34.70\%)


Graph 10. The attitude of the respondents of Understanding facilities

Most of the surveyed students from elementary school Dubravica understood mathematical ideas and procedures in operation in the group, the smaller number is indifferent, at least the students who did not understand. Similarly responded and pupils of Busovaca, most of them understand mathematical ideas and procedures, fewer did not express their opinion, at least the students did not understand the mathematical ideas and procedures. Pupils of Kaonik generally understood mathematical ideas and procedures, a smaller part is fully understood by the target hours, some are indifferent, and was not even one student who did not understand the mathematical ideas and procedures.

Respondents in elementary school Busovaca responded:

- Strongly Disagree(1.80\%)
- Mostly disagree (8.80\%)
- I'm not sure (24.60\%)
- Generally agree(19:30\%)
- I agree completely (45.60\%)

Respondents in elementary school Kaonik responded:

- Strongly Disagree( $0.00 \%$ )
- Mostly disagree (9.50\%)
- I'm not sure (19.00\%)
- Generally agree(38.10\%)
- I agree completely(33.30\%)

Respondents in Dubravica school responded:

- Strongly Disagree(6.10\%)
- Mostly disagree (8.20\%)
- I'm not sure (12.20\%)
- Generally agree(22:40\%)
- I agree completely(51.00\%)


Graph 11. The attitude of respondents on the work of the group in relation to the understanding of the material

Based on the results, we conclude that most of the surveyed students better understand the material work in a group. A small number of students is not entirely safe, or is indifferent, and only a handful of them do not agree with this statement.
Respondents in elementary school Busovaca responded:

- Strongly Disagree(3.50\%)
- Mostly disagree (3.50\%)
- I'm not sure (17:50\%)
- Generally agree(19:30\%)
- I agree completely(56.10\%)

Respondents in elementary school Kaonik responded:

- Strongly Disagree ( $0.00 \%$ )
- Mostly disagree (4.80\%)
- I'm not sure (9.50\%)
- Generally agree(23.80\%)
- I agree completely (61.90\%)

Respondents in Dubravica school responded:

- Strongly Disagree(2.00\%)
- Mostly disagree 2.00\%)
- I'm not sure ( $12.20 \%$ )
- Generally agree(16:30\%)
- I agree completely(67.30\%)


Graph 12. The attitude of respondents on the time required for the execution of tasks

The majority of respondents in all three schools confirmed that they work in a group helped complete the task within the allotted time. A small number of generally agreed with this statement, or is indifferent, at least the students who have failed to solve the task on time or their group work was not necessary to solve the task.
Respondents in elementary school Busovaca responded:

- Strongly Disagree(3.50\%)
- Mostly disagree (3.50\%)
- I'm not sure (17:50\%)
- Generally agree(15.80\%)
- I agree completely(59.60\%)

Respondents in elementary school Kaonik responded:

- Strongly Disagree( $0.00 \%$ )
- Mostly disagree (4.80\%)
- I'm not sure (14.30\%)
- Generally agree(19.00\%)
- I agree completely(61.90\%)

Respondents in Dubravica school responded:

- Strongly Disagree(6.10\%)
- Mostly disagree (6.10\%)
- I'm not sure (8.20\%)
- Generally agree(24.50\%)
- I agree completely(55.10\%)

Table 3. Analysis of the results of students' attitude about cooperative learning


The following results have come by analyzing students' attitudes about cooperative learning.
Working in a group does not like ( $2.40 \%$ ) students, and $(3.90 \%)$ generally does not like to work in a group. It is not certain $(14.20 \%)$ of respondents. The majority of respondents like to work in a group ( $66.10 \%$ ) and ( $13.40 \%$ ) generally agrees with this statement.
Help from a friend in the group requested (48\%) respondents, and $(4.70 \%)$ did not. Are the requested assistance is not safe ( $16: 50 \%$ ) students, (3.10\%) is generally not sought help, while ( $27.60 \%$ ) mainly sought the help of other group members.
Questions in the group are not set $(5.50 \%)$ of the respondents, while ( $9.40 \%$ ) mostly did not answer any questions from the group. Not sure $(22 \%)$ of the surveyed students. The questions were raised (38.60\%) respondents, and $(24.40 \%)$ is mainly answered the questions of the group.
Mathematical ideas and procedures in operation
in the group did not understand (10.3\%) of the surveyed students, and $(8.70 \%)$ were generally not understood. Evenly (18.90\%) students. Most understood mathematical ideas and procedures (45.70\%), while ( $23.60 \%$ ) of respondents generally understand mathematical ideas and procedures.More than half of respondents $(61.40 \%)$ answered that they work in a group helped me to better understand the material and just $(2.40 \%)$ of the surveyed students did not correspond to group work. The realization of teaching in this way tend to disagree ( $10.3 \%$ ) students, it is not certain ( $14.20 \%$ ), while generally agrees ( $18.90 \%$ ) students.
Group work helped (58.30\%) of the surveyed students to complete the task on time, and just (3.90\%) students had not helped. It is not certain $(13,40 \%)$ patients, a smaller number ( $4.70 \%$ ) disagreed with this statement, and generally agrees (19.70\%) of respondents.

Table 4. The average value per replies
A cooperative in the richer senseArithmetical mean (M)

1. All the Mrs. I work in a group in math class.4.37He asked the $2 \mathrm{nd} / \mathrm{I}$ have friends from the group that we explain part a task thatis not clear.4.11
2. Friends of the group have asked me questions while working in a group.3.81
4th understood / I mathematical cal ideas and actions when I worked / la the
group.4.00
3. The work of the group has helped me to better understand the topic to be discussed in class ..... 4.34
4. Work in the group helped me to complete the task of PWM on time. ..... 4.24

From these average values we can conclude that the respondents prefer to work in groups on math class $(M=4.37)$, and that there is a group work helped you better understand the materials to be discussed in class $(M=4: 34)$, and to complete the task the time ( $\mathrm{M}=4.24$ ). A positive attitude have the possibility of questions from a group of friends to explain part of the task that they are not clear $(M=4.11)$ as well as the understanding of mathematical ideas and procedures while working in a group $(\mathrm{M}=4.00)$. The respondents are not inclined to ask questions of the friends group, which confirms the lowest mean value ( $\mathrm{M}=3.81$ ).
From the responses it is clear that the students support
the implementation of the lesson, cooperative learning method. Thus, successful operation, communication among students, and the positive atmosphere, helping students to feel useful, to better understand the material and hours to complete the task on time.
Based on the analysis of the results of the study, we concluded that children have a certain amount of fear of mathematics no matter what they like the subject. We could interpret this fear as a driving force for better results, because most of the surveyed students said that mathematical knowledge is important for the development of other skills. The use of cooperative learning methods proved functional in the teaching process, and therefore those answers had high mean.

## CONCLUSION

Cooperative learning approach can be defined as a small group in which each individual gives their best to jointly study the given materials. Cooperative learning has advantages and disadvantages compared to traditional teaching. The advantages of cooperative learning can be best to find those students who in traditional teaching show disinterest in mathematics and disadvantages cooperative approach is reflected in the lack of education and poor organization of teachers. Based on survey results, we can conclude that the cooperative way of learning has a positive effect on students. All participate in problem solving, they are proud of themselves for the contribution group and giving their own ideas, do not feel rejected and less valuable, but they are equal and truly enjoy learning new material.A positive attitude about cooperative learning, school climate, interaction and communication among students, is a sufficient reason for the large number of research as evidenced by the results of research in the United States where research on cooperative learning is one of the biggest success stories in the history of education. Data from 1993 show that this form of learning is constantly used by $79 \%$ of primary and $62 \%$ secondary school teachers. Despite, research and evidence about the powerful effects when it comes to student achievement, as well as their socio-emotional development in our country is still represented by traditional teaching. One reason for the low representation of this form of
learning is insufficient teacher training, as well as the initial failures. If in their hour of organized cooperative learning method has no motivation, no cooperation and discipline, they give up. However, whether it will be successful cooperative learning depends most of the teachers adequate preparation. I believe that each introduced innovations in the learning process encourages interested students and affects their individual commitment. If the students did not understand a certain subject matter and have no support, and further clarification by a teacher of mathematics, such a superficial adoption does not lead to interest in the subject. Therefore, cooperative learning approach can positively affect these students, because they will get a form of assistance by the successful students who will be like a guide to work together. After successful completion of group work the students who participated in making the task will feel worthy. In this way, it will return confidence to those who felt the lack of interest in the subject, as well as the fear of the subject.

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