COOPERATIVE LEARNING –
APPLICATIONS FOR CHILDREN FROM PRIMARY SCHOOL

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Abstract: *This study was intended to assess the efficacy of an intervention program built on the principles of cooperative learning. We assumed the classroom climate of 4th graders would improve for the experimental lot (n=32) as compared to the control lot (n=30). Our research tool was The Classroom Climate Questionnaire designed by Johnson & Johnson (1983, 1996) and adapted for the Romanian population by C. Popa (2010). The intervention program was conducted on a 5-week period of time, on a basis of 3 hours per week, and it completed 15 cooperative learning activities in History, Civic Education and Religion.The results showed that working in cooperative learning groups leads to both, minimize the need for teacher support and minimize the need to learn independently from one's peers. The intergroup comparisons showed that the need for independent learning in relation to one's peers had dropped for the children in the experimental lot as compared to the children in the control lot, in posttest (t=-2,247 p=0,028). The results for intragroup comparisons for the experimental lot are statistically significant for the following subscales: teacher support (t=2,326, p=0,025), having a lower mean in posttest, and independent learning (t=2,298, p=0,029), having a lower mean in posttest. For the control lot, there were statistically significant results for the subscale of independent learning (t=-2,147, p=0,040), having a higher mean in posttest.*

Keywords: *cooperative learning; support in learning; classroom climate; primary school;*

1. Introduction

Coming home from a parents' meeting from my son's school, I was wondering if all teachers are more focused on academic performance and excellent results for their classes than on their students' well being and joy of life. Why this question? My son was in the 3rd grade, and his teacher told us that during the week dedicated to extracurricular activities (*Școala altfel* – School in a different way) the children would take part in a school competition every day. Unfortunately, for many, the results in such competitions and the need for medals and diplomas/prizes are the most important indicators for the academic performance of a class/grade/school. Plainness (depersonalized) teaching, focus on excellent results with no concern for children's interest or motivation, ranking and competing, they are all present realities in nowadays school teaching activities in Romania. We personally believe there is a need for chance: the teachers should be made aware that achieving academic performance is conditioned by the child's involvement and motivation in reaching learning objectives, that they should teach the children 21st century skills: "critical thinking and problem solving; creativity and innovation; communication; teamwork/collaboration; diversity; leadership; professionalism/work ethic; ethics/social responsibility; lifelong learning/self direction; ICT literacy" (Casner-Lotto, 2006, apud LeButt, 2012, p. 5).

Cooperative learning is a teaching method that focuses on the students, but only if the teacher is open to communicate with them, to build with them a relation based on values like: cooperation, honesty, fairness, dialogue, transparency. Thus, the teacher has to undertake more various roles than the traditional ones. J. Howden underlines some of these roles: planning, observing (keeping in mind that the entire process of observation is conducted

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following certain stages: readiness/preparing, observation – a systematic data recording, intervention and summarizing), intervention (to correct understanding errors or wrong conceptions, to show the children the correct way of using cognitive and social skills; the intervention has to be minimal and it has to occur only when a certain problem/issue cannot be solved by the children by themselves), reflection (there has to be a time allocated for reflection and for discussing on functioning as a team and on solving the working task) (1997, apud Nicu & Conțiu, 2010, p. 66 – 69).

Cooperative learning has proved to be a complex learning strategy that draw the attention of teachers and specialist from the field of Sciences of Education. In his review on the researches on cooperative learning, Gillies R.M. (2014) underlines that cooperative learning is known as a pedagogical method that promotes learning and socialization among children and teenagers, from kindergarten to college.

D. Johnson, R. Johnson and E. Holubec show the particularities of cooperative learning groups as opposed to traditional learning groups by stating that "cooperative learning is the instructional use of small groups so that children/students work together to maximize their own and each other's learning" (1994, p.3). Cooperative learning group is different from other types of groups by the fact that "the focus is not only on reaching certain learning skills, but also on building certain interdependent relationships among the members of the group, and on the everyday practice of social skills to maximize the unity of the group, and thus, the unity of the entire classroom" (Popa, 2010, p. 30).

In *Cooperative learning for intercultural classrooms* , Ferguson-Patrick & Jolliffe (2018) underline the benefits of cooperative learning:
- "Cooperative learning improved academic outcomes" (p.6)
- "Social and emotional learning – Cooperative learning improves social skill development and helps to promote socialization and learning among students" (p. 8)
- "Student relationships – Cooperative learning has an impact on student relationships because in a classroom of this type students assist others with their learning and, in doing so, give and receive help" (p. 8)
- "Including all students in learning" (p.9)

Our study was intended to analyze the effects of cooperative learning on classroom climate, thus, we want to pinpoint various opinions on the concept of classroom climate as presented in the field bibliography, as well as to to present the results of certain researches on the subject.

F. Cerezo and M. Ato define classroom climate as "a concept that sums up all the main aspects concerning classroom environment that coexist with all learning processes, and involves the interaction among subjects and their attitude in completing their working tasks" (2010, p. 138). R. Iucu states that "at classroom level, the climate is the intuitive, and directly perceivable reality for those in contact with its organizing structure, a specific mark for the learning group in question" (2006, p. 160). He believes that the concept of school life "points to the environment, the moral and emotional state of the classroom; it is the indicator of the health of a learning group and it can be taken as an axiological criterion for differentiating student classrooms; it is the product of certain interpersonal relationships on different levels (formal or informal), and their sum, or more likely, their product is the learning climate" (Iucu, 2006, p. 176 – 177).

I. Neacsu also gives a definition for the classroom psycho-social climate saying that "it represents the superior level of integration and maximization of certain factors, objective and subjective, internal and external, that are significant for both, the student and the teacher" (2015, p. 109) and that "generates a psychical mood relatively located and generalized at the level of the group members" (Cristea, 1984, p. 104, apud Neacsu, 2015, p. 109)

Taking into consideration all the above mentioned definitions, it can be stated that "the essential elements of classroom climate are the following: the characteristics of social relationships in the classroom, children/students behaviors in various learning situations, the type of the authority performed in class, the level of (dis)trust in the teachers and children/students"; and also "the level of frustration, intimacy, indifference, distancing, consideration, trust" (Tudorică, 2007, p. 86).

There are also present dimensions of classroom climate, like: collegiality, familiarity, disengagement, support, authority, restrictiveness (Iucu, 2006, p. 161).

For space saving reasons, we will present only some of the studies that analyzed to what degree the classroom climate is influenced by cooperative learning as a teaching method.

In 1985, a team of specialists: D. Johnson, R. Johnson, Bucknam & Richards studied the influence of work experience in cooperative groups on children's attitude towards classroom climate. The subjects were 8th graders and they had to fill in *The Classroom Life Instrument* questionnaire (this is the research tool that we have adapted and used in our study). Research results showed that "children having a positive attitude towards working in cooperative groups had the same positive and encouraging attitude towards classroom climate, too".

In 1986, Farivar's quasi-experimental study compared the cooperative class with the traditional one. He had 57 subjects from the 3rd and 4th grades and three teachers. The dependent variables were: social relationships, children attitudes, their school results, performance at the intellectual level and classroom climate. Research data showed that cooperative classroom children have positive feelings for their colleagues, unlike the ones in traditional classrooms; they enjoy working cooperatively, but not in competitions; they have a positive approach on working cooperatively with more intelligent children than themselves and not with children having a lower IQ; cooperation maximizes performance and interpersonal relationships; there were significantly statistic differences between the two classrooms for all six subscales that measured classroom climate (apud Satyaprakasha, 2015, p. 41).

In 1991, Kevin Johnson analyzed in his PhD thesis, *The effect of cooperative learning on student and teacher support in first grade*, to what extent is there a positive correlation between perception of social support and positive attitude towards cooperation. The research was conducted on a subject lot of 1st graders. Research data validated the fact that "in the classrooms where teachers provide and support a cooperative environment, children feel they are helped to reach academic performance and personal development" (apud Popa, 2010, p. 53). An important fact is that "such an environment is the result of a precise and adequate implementation of learning social and cognitive skills" (Johnson, 1991, apud Popa, 2010, p. 53).

Effects of cooperative learning structures on self-esteem and classroom climate in social studies (1996) is a study made by a group of teachers from the National Institute of Education from Singapore, which analyses how cooperative learning can be implemented at classroom level and whether this teaching strategy can maximize classroom climate and children self esteem (Lee, Lim & Ng, 1996, p. 1). Both research lots, experimental (n=36) and control (n=38), were formed with 5th graders that had Social Studies lessons for one hour and a half each week, during two school semesters. Kagan's structures of cooperative learning were used as teaching strategy: *Listen-think-pair-share*, *Numbered heads together*, *Sequential roundtable* and *Send-a-problem* (Lee et. al., 1996, p. 3). Classroom climate was also measured with *My Classroom Inventory* (MCI) designed by Fraser in 1982 and having 5 subscales: MCI1 (*Satisfaction* – measures classroom's state of well being), MCI2 (*Friction* – measures the aggressive behavior of children), MCI3 (*Competition* – measures the

importance of achieving academic performance within the classroom), MCI4 (*Difficulty* – measures children's perception on the difficulty of the class activities) and MCI5 (*Cohesiveness* – measures the friendship relations between the children in the classroom) (Lee et. al.,1996, p. 4)

After the experimental stage, there was a significant difference at the experimental class for the *Difficulty* subscale, showing that cooperative learning stimulates mutual support and team work, and the children see the tasks as being less difficult. But, there were no significant improvements for the most part of the measured variables on classroom climate, except the difficulty of classroom activities. One of the findings was that "the emotional aspects of cooperative learning can be hardly measured within the classroom; but, still, many of the interviewed children said they'd rather work in groups than by themselves, because such an activity makes the lessons less difficult and more enjoyable" (Lee et. al.,1996, p. 10 - 11).

In 2008, Roseth, Johnson & Johnson underlined that the best academic results and positive relationships between peers were associated with a cooperative structuring of the objectives, more than with a competitive and individual one (apud Gillies, 2014, p. 794).

In her PhD thesis, C. Popa (2010) conducted a vast research to validate the efficacy of the Learning together cooperative pattern to primary school in Romania. For 10 weeks, she used this teaching pattern in teaching-learning activities for Romanian language and Mathematics classes, for 1 hour each, in 6 experimental classrooms (three 3rd grades and three 4th grades). One of the hypothesis of the above mentioned study was to see to what extent "using *Learning together* teaching pattern leads to achieving a different perception from the children on classroom cooperative relationships and students and teacher support" (Popa, 2010, p. 240). Research data validates this hypothesis: children had a better perception on student and teacher support and on cooperation. The results of post-test and re-test (comparisons for pre-test – post-test means and post-test – re-test means, as well as comparisons between the means of experimental classrooms and the means of control classrooms in post-test and re-test) show that "working in cooperative groups helps the children to have a positive attitude towards classroom climate" (idem, p. 240). Another finding is that "preserving a student positive attitude towards cooperation and student and teacher support requires a long term practice and a need to generalize cooperative principles on all classroom activities. Having a cooperative climate while peer teaching leads to a better understanding of the role of cooperation and to the consolidation of the children's cooperative skills. If we want our students to use these skills in everyday life, the whole educational process has to focus on cooperation" (idem, p. 240).

The above mentioned studies show there is a constant interest at the international level on identifying the effects of cooperative learning on classroom climate. This pedagogical trend requires and motivates us, the Romanian field specialists, to also conduct researches to identify the effects of the implementation of cooperative learning in Romanian schools.

Research goal
The goal of the present research is to identify the efficacy of an intervention program based on teaching activities centered on cooperative learning principles with primary school children to maximize/improve classroom climate.

Research hypothesis
We start our study from the hypothesis that the implementation of an intervention program based on cooperative learning leads to a maximization of classroom climate for the children in the experimental lot;

Independent variable (a): implementation of the intervention program and its assessment

a1: pretest assessment
a2: posttest assessment

Dependent variable (x): children's results in *Classroom Life Instrument*

Research lot

The research lot comprised a total number of 62 children from the 4th grade from "Emanuel" Baptist Theological High School, in Oradea, divided in the experimental lot (32 children) and in the control lot (30 children); as gender division, 36 were girls and 26, boys.

Research procedure

The intervention program was conducted on a 5-week period of time, on a basis of 3 hours per week, and it completed 15 cooperative learning activities in History (1h/w), Civic Education (1h/w) and Religion (1h/w). All these three school subjects belong to Social Studies (Rom. "Om și societate") curricular area.

In History, the children learned about: Iancu of Hunedoara (1441-1456) – voivode of Transylvania, Transylvania – multi-ethnic space, Cuza and the Union of the Romanian Principalities (1859), Romanian Independence War under King Carol I (1877-1878).

In Civic Education, they tackled the following topics: Violation of children's rights, Defending children's rights, Moral norms and children's human rights – Revision, Moral norms and children's human rights – Assessment.

In Religion, the following topics were talked about: Living in harmony with the others – God's commandment, God's commandments are not difficult, The great commandment of love, Our Lord Jesus Christ put into practice the great commandment of love.

Description of the intervention program

The intervention program had two stages. During the first stage (3 lessons), the children from the experimental classroom were divided into groups, they were helped to rearrange the sitting in their classroom, got accustomed to cooperative learning groups and performed activities to develop their interpersonal skills. The children in the classroom were divided into 6 groups of 5-6 members each. The teacher had the children fill in a sociometric questionnaire to identify the students with the highest level of acceptance in the classroom, so he could decide the members of each group. The teacher also made sure that each group had children who accepted and were willing to work with one another. The groups were heterogeneous as children's academic performance and gender were concerned.

The children were explained in an age appropriate manner the five basic cooperative learning principles as stated by David and Roger Johnson. The positive interdependence was summed up with the statement: "We need one another!"; individual responsibility, by "Willingly solve the task!", face-to-face interaction, by "Give support to the others!", while personal and group skills took the form of group work rules: "We speak in a low voice!", "We speak in turn!", "Encourage your peers!", "Listen carefully to the others!". These skills were practiced by the children in role plays and, at the end, they filled in charts for each of the skills (eg. for "We speak in turn!", the children wrote for seen behaviors: "We look in the eyes the person we talk to", "We call him/her by his/her first name!", "We speak only when our colleague has finished speaking"; while for what we hear, "The name of the person we talk to spoken in a low voice", "What we tell our colleague in a low voice", "Words spoken in low voice to our colleague").

The children were also explained the roles they can have inside the groups, like: "speaker/ the voice of the group" - he/she tells the group/classroom the task/results of their

team work, "secretary" - hands in the materials/writes the answers of his/her group, "cheerleader" - encourages all members to work together in a friendly manner, "noise supervisor" - uses conventional signs to remind the group to make less noise, "time supervisor" - makes sure the group solves the task in due time and constantly reminds them the amount of time left or if they have to step up, "observer" - supervises the way the roles within the group are delivered and how they work in a cooperative way.

The last of the principles of cooperative learning was the assessment of group functioning. The children were told the teacher would monitor not only the results of their tasks, but also the way they manage to practice within their group the interpersonal skills they'd learned about during cooperative learning activities. Each week, they had to fill in a self-assessment chart for group activity ("How would you rank your contribution to task solving?", "How do you see your involvement within your group?", "What problems did you have in solving the task?"). They also had to fill in a chart about group functioning and group members' behavior ("What improvements should be made within your group?", "What changes should be made within your group?", "How do you see your group members' participation to task solving?", "How do you see your group members' involvement within your group?")

The activity aiming the development of their interpersonal skills was a game; the children had to tell their group members certain details about their personal life (eg. the names of the persons they love, a thing/fact the others do not know about him/her, the places where they spend their holidays, their hobbies etc.)

During the second stage of the study, the teacher performed weekly activities in History, Religion and Civic Education, and there was peer working, but also pair or group work. The group work tasks aimed at cooperatively solving various handouts having a wide range of topics, as presented in the above pages. As an example, in Religion, after the teacher presented the 10 commandments, the children worked in groups: they talked about real situations they'd experienced/heard/seen in which the commandments were obeyed or broken and they had to rank the most important 3 commandments for children, but also to give arguments to support their ideas. The interdependence skills practiced in solving this task were the following: the interdependence of goals (the main goal of the group was to present in front of the classroom each group's ranking of the 3 most important commandments, after group discussions), the interdependence of roles (each group member had a clear defined role: secretary, time supervisor, noise supervisor etc), the interdependence of reward (each group would receive a score for solving the task; the teacher monitored the score chart and at the end of the school day, they received rewards) etc.

Research tools

Research data was gathered with The Classroom Climate Questionnaire designed by Johnson & Johnson (1983, 1996) and adapted for the Romanian population by C. Popa (2010). The questionnaire had 48 items divided into 5 subscales: student support (3, 12, 13, 18, 20, 22, 23, 24, 26, 31, 34, 42), teacher support (2, 8, 11, 14, 21, 25, 29, 30, 32), cooperation (6, 9, 28, 35, 37, 40, 41, 44, 46), competition (1, 17, 36, 38, 39, 43, 48), extrinsic motivation/social approval (4, 7, 15, 19, 27), individual learning (5, 10, 16, 33, 45, 47). The answers were recorded on a 5-level Likert scale.

Research data analysis

Research hypotheses were tested with SPSS17. We analyzed data distribution by Kolmogorov-Smirnov test and saw that data distribution is symmetric (test values have significance thresholds higher than 0,05 for each of the subscales of the research tool); research data would be analyzed by parametric comparison tests.

In pretest, the results after comparing the means of the two subject lots justifies the fact that we could use them as being equivalent, except for the results of student support subscale: there were higher means for the experimental lot (m_lot de control =4,3370, m_lot experimental =4,6319; t=2,402, df=41,834, sig=0,021).

To validate research hypothesis, we used Independent Samples t Test, but also Paired Samples t test. The results for independent samples are presented in **Table 1**.

Table1. Comparative results for independent samples in *Classroom Climate Qustionnaire*

Subscale	Lot	Mean	Standard deviation	t	df	Sig. (2-tailed)
Student support	Experimental group	3,445	,6411	,225	60	,822
	Control group	3,405	,7462			
Teacher support	Experimental group	4,333	,6612	-,062	60	,951
	Control group	4,344	,7543			
Cooperation	Experimental group	4,086	,9337	,616	60	,540
	Control group	3,948	,8313			
competition	Experimental group	3,258	1,0930	-,455	60	,651
	Control group	3,371	,8250			
Extrinsic motivation	Experimental group	2,993	1,2520	,137	60	,892
	Control group	2,953	1,0565			
Individual learning	Experimental group	2,901	,8261	-2,247	60	,028
	Control group	3,394	,9028			

The analysis of research data in **Table 1** presented statistically significant differences for *individual learning* subscale t=-2,247, df=60, p<0,05, with a lower mean for the experimental lot (m=2,901) as compared to the mean of the control lot (m=3,394).

The intervention program lead to minimize the need for individual learning for the children in the experimental lot, the effect being an average one (d=0,58) according to Cohen's criteria.

At the comparative analysis of the results of all other subscales there were no statistically significant differences.

The results for **paired samples** for the same research tool are presented in **Table 2**.

Table 2. Comparative results for paired samples in *Classroom Climate Questionnaire*

Lot	Subscale	Stage	Mean	Standard deviation	t	df	Sig. (2-tailed)
Experimental group	Student support	Pretest	3,4896	,64018	,431	31	,670
		Posttest	3,4453	,64118			
	Teacher support	Pretest	4,6319	,30059	2,736	31	,010
		Posttest	4,3333	,66127			
	Cooperation	Pretest	4,1667	,61444	,682	31	,500
		Posttest	4,0868	,93378			
	Competition	Pretest	3,3125	,99003	,302	31	,765
		Posttest	3,2589	1,09306			
	Extrinsic motivation	Pretest	3,1750	1,17364	1,042	31	,306
		Posttest	2,9938	1,25208			
	Individual learning	Pretest	3,2500	,75372	2,296	31	,029
		Posttest	2,9010	,82616			
Control group	Student support	Pretest	3,5417	,83728	1,058	29	,299
		Posttest	3,4056	,74623			
	Teacher support	Pretest	4,3370	,60612	-,071	29	,944
		Posttest	4,3444	,75435			

cooperation	Pretest	4,2037	,72543	1,471	29	,152
	Posttest	3,9481	,83134			
Competition	Pretest	3,3048	,90874	-,389	29	,700
	Posttest	3,3714	,82501			
Extrinsic motivation	Pretest	2,9467	1,17319	-,035	29	,972
	Posttest	2,9533	1,05658			
Individual learning	Pretest	3,1333	,96331	-1,296	29	,205
	Posttest	3,3944	,90283			

The analysis of the research data in **Table 2** shows statistically significant results for the experimental lot for two of the subscales of the research tool:

Teacher support (t=2,736, p<0,05), which shows that the children's need to get support from the teacher minimized in post-test (mpretest=4,6319, mposttest=4,3333). The effect size measure indicates an average influence of the intervention program at the experimental lot for this subscale (d=0,49).

Individual learning (t=2,296, p<0,05), which means the children's need to learn independently minimized in post-test (mpretest=2,901, mposttest=3,25). The effect size measure indicates an average influence of the intervention program at the experimental lot for this subscale (d=0,412).

There were no statistically significant results for any of the subscales of the research tool for the ***control lot***.

Findings

Our research results show that *the need for teacher support*, as well as the need for *individual learning* had minimized when we used cooperative learning groups for school activities.

We believe it is important for our students to gradually gain independence from the teacher; when frequently using peer teaching, the teacher does not give the children the possibility to work on their own. That is why one of the difficulties the children experienced when working in groups was the lack of trust in their actions to solve the task, frequently asking the teacher for guidance in what they were supposed to do. Many teachers told us that the most common mistakes in a test are due to the improper reading of the working tasks. Practicing group work made the children to communicate more with one another to overcome different obstacles. Throughout the program we kept telling the children that the teacher should be asked for guidance only after the problem was discussed within the group and none of the members could find an answer for it. So, gradually, the children stopped asking questions to the teacher and started communicating with one another.

We talked to the children and found out they really loved being given the opportunity to freely express their opinions and to talk among themselves. They enjoyed being actively involved in the learning activity due to their roles within their groups, for task solving. In other words, they became aware that the opinion and contribution of each group member matters and that learning can be also achieved when working in groups, not only when one learns by himself/herself.

One of the limitations of this research is the short period of time of the intervention program in which the cooperative learning activities were performed with the children. Although statistically the results of The Classroom Life Instrument did not show significantly increased effect size measures for all of its subscales, the teachers involved in the program stated there was a change in children's behavior: they paid more attention to the way they communicated to one another and they helped one another more. Furthermore, the teachers, even if distrustful at the beginning in the impact of cooperative learning, at the end of the experiment, changed their minds. The class teacher observed every activity of the program and she was amazed of the way the children interacted ("I did not believe that children can

work in groups and we do not lose control of the class, that they can so seriously take charge of their roles"). We believe that many teachers do not use this teaching model because of their superficial understanding of group work ("I believed that group work means just giving students tasks and letting them solve the tasks by themselves. Now, I've understood that if we want to teach the children to cooperate, we have to teach them the ABC of cooperation by explaining them the rules, the roles, but also to carefully monitor both, their academic performance, and the quality of their interactions, the level of their social skills.") The same idea is also stated by the authors Ferguson-Patrick & Jolliffe (2018):

"Barriers to developing cooperative learning that help explain its lack of use are twofold. The first concerns political motives that promote more traditional approaches to teaching in a drive to improve attainment, and the second concerns a lack of sufficient understanding by teachers of cooperative learning." (p. 9-10)

Because these activities were scheduled as the last classes of the school day, there was a drop in attention and concentration during task solving for some of the children.

Another limitation of the experiment was the teacher that conducted it: he was a 3rd year student in Primary and Preschool Education, at the University of Oradea, but he used this teaching strategy for the very first time, although he had a teaching experience of several years. He got familiarized with cooperative learning during a 2nd year optional course "Cooperative learning", so he only had theoretical knowledge about it. The lack of a complete program that should have included him also being monitored by an instructor with a greater experience in cooperative learning can explain the existence of significant differences for only two of the subscales of the questionnaire.

Because of the positive attitude of children towards this pattern of cooperative learning, it is recommended this interactive teaching strategy should be used over a longer period of time and in school subjects from other curricular areas, as well. And due to the social dimension of cooperative learning, it is important we study its effects on the development of social skills of primary school children, too. The study can also be used for secondary school children and/or high school students.

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