

RESEARCH AND EXPERIENCES ON COOPERATIVE LEARNING IN BRAZIL

Pesquisa e experiências em aprendizagem cooperativa no Brasil

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Abstract. This article presents in the form of a report the research and educational experiences developed in Brazil by applying the methodological model of teaching and learning, known as Cooperative Learning. After an initial conceptualization, both the research and experiments showing the effectiveness of the model are briefly presented. They present three major cooperative learning projects currently underway in the country.

Keywords: teaching methodology; teaching and learning; cooperative learning; team work; educational research.

Resumo. Este artigo apresenta em forma de relato as pesquisas e experiências educacionais desenvolvidas no Brasil com a aplicação do modelo metodológico de ensino e aprendizagem chamado de Aprendizagem Cooperativa. Após uma conceituação inicial, são apresentadas brevemente as pesquisas e as experiências que mostram a eficácia do modelo. São apresentados três grandes projetos de aprendizagem cooperativa atualmente em curso no país.

Palavras-Chave: metodologia de ensino; ensino e aprendizagem; aprendizagem cooperativa; trabalho em equipe; pesquisas educacionais.

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1 INTRODUCTION

Cooperative learning is a teaching and learning methodology which is based on many different ways to organize the studies and research in the classroom and beyond, so students study and learn in small groups. In cooperative learning under the guidance of the teacher, students work in small teams who build their own knowledge and develop various interaction skills, learning and cooperation. The success of cooperative learning is based on some main elements: positive interdependence, individual accountability, skills development, equal participation, group dynamics and interaction among its members.

Let us now consider some studies and practical applications in the use of Cooperative Learning and its results in Brazil. It is very important to note that these and other studies clearly show that compared with traditional learning models (individualistic or competitive), the experiences of cooperative learning promote better interpersonal relationships, better academic performance and more positive attitudes towards colleagues.

2 KNOWING THE PROJECTS

In addition, research, programs, activities and projects aimed at cooperative learning in Brazil in the field of academic performance, skills training, skills and values have been carefully presented and all have better results compared to other teaching models:

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- a) The Project PRECE² - "Educational Program in Cooperative Cells", originally deployed in the city of Pentecost - CE (Brazil) in 1994 and operates continuously since then;
- b) Research on the academic performance of students of Portuguese Language and Mathematics conducted in the implementation of "Cooperative Learning Project" of CADI³ in the city of Ipatinga - MG (Brazil) in 1997;
- c) The project⁴ "Pedagogy of Cooperation" - Teacher training and implementation of the methodology of cooperative learning (Brazil) between 1998 and 2015;
- d) The project⁵ "Education in Cooperative Groups" developed at the Faculty of Pedagogy of Vargem Grande Paulista - SP (Brazil) between 1999 and 2005;
- e) The Project PACCE⁶ - Federal University of Ceará (Brazil), "PACCE - Cooperative Learning Program in Student Cells" that began in 2009;
- f) The Project FOCCO⁷ of UNEMAT - State University of Mato Grosso (Brazil), "FOCCO - Training Program in Cooperative Cells" which began in 2013;
- g) The project "Strategies and Teaching Resources and Cooperative Learning" developed at IFSP-SRQ in São Roque - SP (Brazil) in 2012 and 2013 aimed at students of the Degree in Biological Sciences aiming positive attitudes of interaction and study habits⁸.

The analyses of these projects, research and reviews in Brazil indicates that the teaching models in cooperative groups has a positive effect on the student achievement. Practical experience in applying the model work in cooperative groups in Brazil show that there are personal, academic

² Through PRECE, at Pentecost County was founded the first School Cooperative Popular. There, sharing knowledge and experience on the model of cooperative learning enabled the development of skills and social skills of interpersonal relationships, social and student involvement, as well as improvements in learning and increased knowledge that allowed more than five hundred students of popular origin achieve he joined the University. Also it was founded thirteen student associations (Popular Cooperative Schools) in four municipalities (Pentecoste, Apuiarés, Paramoti and Umirim) which enlarged the scope of the program.

³ In College CADI (Ipatinga - MG), the implementation of the methodology enabled real gains in academic performance of students of the Mathematics 42% and in Portuguese of 39% compared to traditional teaching models.

⁴ The "Pedagogy of cooperation" achieved in the five Brazilian regions over 12,000 teachers in lectures and in 5500 specific training courses for cooperative learning between 1998 and 2015.

⁵ In basic training courses of Bachelor of Education students in the Faculty of Vargem Grande Paulista, SP (Brazil) were used continuously learning strategies in cooperative groups to improve the academic performance and development of academic and professional skills. As a result, two different classes of graduates have achieved the highest score in Test (Provão) National Assessment of Higher Education Students. This has positioned this course a small institution in a peripheral city in the metropolitan region of São Paulo (Brazil) to be among the twelve best in the country in a universe of almost 700 courses evaluated.

⁶ In 2009 the Federal University of Ceará created "PACCE - Cooperative Learning Program Student cells" in order to reduce tax evasion and increase rates of completion of the courses. Since then it has achieved positive results as reports presented at the III Congress Cearense Cooperative Learning occurred in Fortaleza, Ceará (Brazil) between the days 8 and 10 of December, 2014.

⁷ The FOCCO was designed by Dr. Ana Maria Di Renzo, inspired by the model developed by Dr. Manoel Andrade (UFC). The Cooperative Cell Training Program occurs in UNEMAT since early 2013 and is led by prof. Renata Cintra.

⁸ Between 2012 and 2013 we developed the project "Strategies and Resources for Teaching and Learning Cooperative" directed to graduates of Biological Sciences Degree. Questionnaires and interviews showed improved interpersonal relationships, strengthening the bonds of friendship, growth of aid and mutual support, positive change of study habits, emotional and academic development partner. The project and the results were approved by the Teaching Coordination and Research of the Federal Institute of São Paulo, São Roque campus and directed by Frank Viana Carvalho.

and professional development in skills and personal values, as well as improving the skills of positive interpersonal relationships⁹.

Cooperative learning enhances meaningful learning processes and creates conditions for active and frequent participation in the activities of groups and positively interferes in the processes of teaching and learning. Proposals for work and group activities in the cooperative teaching methodology make each student has a responsibility and a real commitment to the learning in the activities promoted in the group in the classroom or outside. Participation opportunities are real, common and inclusive. We listed among fifty abilities, values and skills only the main ones that appeared more often in interviews and questionnaires:

- Cooperation ● Social Protagonists ● Self-control ● Self-Determination
- Flexibility ● Assertiveness ● Leadership ● Resilience
- Generosity ● Decision and Choice ● Share ● Search for Solutions
- Courtesy ● Self-confidence ● Self Motivation ● Critical reflection
- Solidarity ● Mutual Respect ● Empathy ● Camaraderie
- Active participation ● Improved self-esteem ● Individual responsibility and group
- Effective Communication

Active student participation in the construction of own knowledge and direct interaction with the themes, issues and concepts studied

3 THE ACADEMIC RESULTS OF RESEARCH ON COOPERATIVE LEARNING IN BRAZIL ARE SIMILAR TO THE RESULTS OBTAINED IN THE UNITED STATES

The implementation of cooperative learning in CADI-MG in 1997 allowed an examination of the academic performance obtained. The basis for comparison were established and measured by teachers of, Mathematics and Portuguese. These teachers established as parameters their students studying in public schools where they were teaching before transferring to the CADI. The research has shown that the achievements of the students studying in cooperative groups, when compared directly with the performance of students who sat individually (and studying in traditional settings), was significantly better: the real gain of students in Mathematics was 42 % and in Portuguese it was 39%.

The researches and studies made by David and Roger Johnson (1981), Robert Slavin (1983), Phil Basset (1994), Spencer Kagan (1995), and William Green (1996) with thousands of students in the United States has shown a real gain comparing to the traditional education model. Spender Kagan features in their studies that these academic gains changed positively 46% in favor of cooperative learning. But the effect of cooperative learning proved so superior to the traditional teaching (competitive or individualistic) that research in some schools attended by ethnic minorities showed that comparative gain exceeded¹⁰ 106%. There are several studies and research about CL in the literature that reinforce these conclusions¹¹.

⁹ In the project "Strategies and Teaching Resources and Cooperative Learning" developed in the IFSP-SRQ in São Roque - SP (Brazil) in 2012 and 2013.

¹⁰ KAGAN, S. *Cooperative Learning*. Publisher: Resources for Teachers, Inc., USA, p. 2 to 8.

¹¹ The names of the studies and their authors: TJOSVOLD, D.; JOHNSON, D. W. Controversy between contemporary educational perspectives from analysis of the competitive environment and the cooperative context. *Contemporary Educational Psychology*, v. 3, p. 376-386, 1978; JOHNSON, DAVID, W. The Socialization and Conducting Search crisis:

4 ACTIVE STUDENT PARTICIPATION IN THE CONSTRUCTION OF OWN KNOWLEDGE AND DIRECT INTERACTION WITH THE THEMES, ISSUES AND CONCEPTS STUDIED

On the methodology of the new school as in the constructivism, the student actively participates in the construction of knowledge itself. The same happens in cooperative learning, because in this model and process, led by the teacher in class or by students while on study outside the classroom, everybody build relationships of teaching and learning and they share knowledge with colleagues. The chances of academic development in the acquisition and construction of knowledge and are also leveraged the opportunities for success in the joint search for solutions to the various activities proposed.

5 INCREASED SELF-ESTEEM AND POSITIVE INTERACTION: WITH COLLEAGUES, WITH TEACHERS, WITH THE EDUCATIONAL INSTITUTION AND THE COMMUNITY

By participating, hear and be heard, learn and teach, grow and interact, share and receive, accept others and be accepted by the staff - the student is seen as a participant and active member of the group to which it belongs - someone who actually works in process teaching and learning. It is in this positive atmosphere of active participation in the construction of knowledge itself occurring interactions that promote increased self-esteem. It also enables the student a better view of the mission of educational institutions and the value of academic progress for individual success and collective.

6 COOPERATIVE LEARNING IN BRAZIL: SUCCESSFUL EXPERIENCES

Several cooperative learning experiences have taken place in Brazil since the 1990s I will present only four projects here, or we would be beyond the scope of this work if we dedicated the required number of pages to report them. First I will present my experience in the project "Cooperation in Education", dissemination and implementation of the model in different parts of the country, especially in southeastern Brazil and then the projects "PRECE" and "PACCE" developed by Dr. Manoel Andrade, the Federal University of Ceará and the project "Focco" running at the State University of Mato Grosso.

6.1 - Education Program Cooperative Cells in Ceará - PRECE and PACCE

Due to its characteristics, the Education Program Cooperative Cells (PRECE) deserves special mention (Figure 1). The PRECE is a cooperative learning project that began in 1994, coordinated by Dr. Manoel Andrade, of the Federal University of Ceará. Earlier, at the rural community of Vine in the city of Pentecost, on the backwoods of Ceará, seven young men were motivated by Dr. Manoel Andrade, to form a study group aiming to enter higher education. The strategies of study and work from the beginning were based on models of cooperation and mutual learning.

Gathered in an ancient house of flour, precarious and adverse conditions did not perform as barriers to progress that young people aspired. As the heterogeneous group, each collaborating in

the solution is in the experiences of Cooperative Learning?. *Social Applied Psychology Annual*, v. 4 (Beverly Hills, California, Sage Publications), p 119-159, 1983; JOHNSON, DAVID, W; SCOTT, L. The Effects of Cooperative Education and Individualized Instruction on Students - Attitudes and Academic Achievements. *Journal of Social Psychology*, v. 104, n. 2, p 207-216, apr. 1978.

teaching and learning processes and group motivated each other in different academic content targets of their study.



Figure 1. Logotype of the project.

With great determination and solidarity, their cooperative efforts soon paid off and a member of that group won approval first to enter the Faculty of Education of the Federal University of Ceará. That approval motivated the group and attracted new students in the region. That form of study, where one was cooperating with each other and everyone shared what they knew, was showing results. Soon, new students were also able to go to college (Figure 2).



Figure 2. One of the slogans attracting students to the university.

In its early years, one of the most striking aspects of PRECE was that once entering in the University, students were encouraged to return to their communities and help others - teaching, encouraging and showing by experience that overcoming it's possible - it certainly fed the cycle of cooperation between those young people. As the years passed, the program has become more complete and comprehensive. In 2002, about forty students of Pentecost enter PRECE study groups and in 2003 they founded the first Cooperative Popular School in the county seat attracting even students from other municipalities. Thus, the sharing of knowledge and the experiences of children's hole was multiplied helping more than five hundred students from small communities to achieve their entry into university. In addition, thirteen student associations were founded (called 'Popular Schools Cooperatives') in four municipalities in Ceará (Pentecost, Apuiarés, Paramoti and Umirim).

Motivated by the work begun by Dr. Manoel Andrade, the UFC - Federal University of Ceará in 2009 created the Cooperative Learning Program Student cells (PACCE) in order to prevent evasion and increase completion rates of higher education (Figure 3). At this time the State of Ceará Secretary of Education established a partnered with PRECE to spread cooperative learning for students and teachers from the state school.

The success of the programs led to the formation of a permanent team led by Dr. Manuel Andrade, who works on the expansion of partnerships and implementation of cooperative methodology. Among the moments of reflection and decision-making, this team performs conferences of cooperative learning. At issue occurred in 2012, the researchers David Johnson and Roger Johnson lectured and shared their experiences. In the 2014 edition, I had the privilege of being invited to lecture and share experiences from the Pedagogy of Cooperation project.



Figure 3. The logotype of the Cooperative Learning project at the Federal University of Ceará.

6.2 - PRECE - The Cooperatives Working Cells

At the beginning, a group of people get together to share knowledge, experiences and their life stories. The students themselves become the learning facilitators on the subject they have more affinity. They are mutually supportive and together overcome their learning disabilities preparing to enter on higher education. Keeping the pioneering proposal, students came back to their communities to manage the Popular Schools Cooperatives and they acted on student cells. The university student becomes an example to others in his community, which encourages other young people to want also go to university. This approach has transformed the story of hundreds of young people in Ceará semiarid region. In its first twenty years of existence, the project has achieved access to higher education of more than five hundred students.

6.3 - Project "Pedagogy of Cooperation" - Teacher Training and Implementation in Schools Networks

In the months of December 1996 and January 1997, Dr. William Green at Andrews University, Michigan (USA), was in Brazil where he intensively taught the discipline "Cooperative Learning" (Figure 4). The teachers who attended the course were elated with the new teaching model presented and experienced in those classes. At the end of the course¹², Dr. Green has launched a challenge to the dissemination and implementation of this proposal, but with caveats: it would be necessary to get the school of local government support and the principal, there should be guidance to teachers and students, and advisory mechanisms, training and continuing education for all to work successfully in the new proposal.

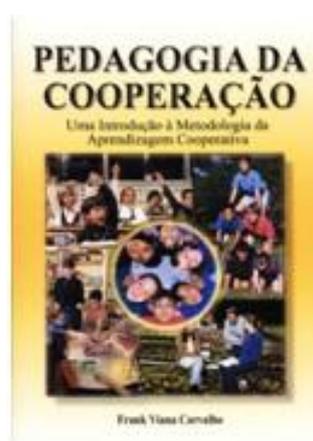


Figure 4. The author's cover of his publication, "Cooperative Learning".

¹² Master Degree in Education - UNASP, Engenheiro Coelho, SP (Brazil).

Many teachers from different parts of the country were attending the course, now they would have the opportunity to implement new ideas with their students. Another part attending the course consisted of administrators, who released the ideas, but did not have the practical opportunity to try them in a classroom. The UNASP, who had eight of his many teachers attending that course, was, from then on, one of the great promoters of the new methodology. I was part of that group and went out with a bolder plan: implement the methodology in all school classes where I acted as director.

In 1997 a pioneering experience in the CADI was held, a school with preschool classes through high school. With the new knowledge, an extensive material involving structural aspects of cooperative learning, from planning to the organization of content and projects was prepared. With this written reference, on the week of planning, guidance counselor Delly Danitza Carvalho and I ministered in-depth course for teachers. Gradually, the written material was being enriched with modifications and adjustments in strategies, practical experiences, situations and classroom processes, contacts with students and parents, translations of research of North American educators and especially with the everyday experience of the school model implementation (Figure 5). Like any pedagogical school work revolved around cooperative learning model, students worked in groups and double most part of the time, and only in the assessments of broader content students sat individually.



Figure 5. Another publication of the author.

In addition we encourage the cooperative groups of extracurricular study we also prepared the organizational support of the institution for cooperative learning: class diaries and various materials were all focused on the application of this methodology. The school has become a field of study for methodological application and it served as a great learning experience for everyone: we have experienced a model that really worked for working in cooperative groups.

The following year, being aware about this work, a school network from Sao Paulo invited me to implement cooperative learning in its school. Challenge: this time, thirteen schools receive courses and advice to gradually adopt this methodology. The course and the material have been completely redesigned and expanded and gave name to the project "Pedagogy of Cooperation". In different school units was offered the course and guidelines prior to the start of the school year¹³.

¹³ The course was divided into three parts: 1 - Introduction and theories; 2. Strategies for Teaching and Learning Cooperative; and 3 - Practice and Monitoring.

In the course, highly practical, teachers have experienced many situations of teaching and cooperative learning, received handouts so that they could gradually carry out the implementation of the new proposals in their classes¹⁴. During this period I visited schools, took the news, helped in planning lessons and in overcoming the difficulties encountered. After one year, the application of the model was part of the routine of faculty and students and all goals and initial expectations were met and exceeded¹⁵. At the same time I was traveling teaching courses and training, I had the opportunity to implement the methodology cooperative learning in higher education, in Vargem Grande Paulista School of Education with great results in improving academic performance¹⁶.

However, it was a personal project of mine that teachers and students could have a reference material that would enable them to move without depending so much of a continuous support. Thus, in May 2000 it was launched the book "Pedagogy of Cooperation" which had three editions reaching more than twelve thousand teachers in the five regions of the country. From there I received even more invitations to teach courses and implement the methodology in public and private schools, whether belonging to school systems, whether individual schools¹⁷. In 2014, fruit of many years and experience in the application of cooperative proposal, I decided to update and enrich the book and the materials of cooperative learning: the new book was launched in march, 2015 and in this moment it is in process of translation to version in English.

6.4 - FOCCO - The Cooperative Learning Project at the State University of Mato Grosso

At the beginning of 2013, Dr. Ana Maria Di Renzo, inspired by the model developed in the UFC created the Focco project (Cell Training Program Cooperative), to collaborate with increasing approval, reduced dropout and increased completion rate UNEMAT of courses (State University of Mato Grosso) by forming cooperative learning cells (Figure 6).

In Focco, the cell Cooperative learning is an organized group maintained by students, which in turn, meet other students from UNEMAT with a view to promoting a discussion and study on a theme, content or discipline to collaborate with the approval of participating students in its undergraduate courses.

¹⁴ In the first year the methodology of deploying some adjustments were and are needed (preparation of classes, awareness of students and parents, among others). In no time the proposal was or should be presented as 'straitjacket' and teachers, to keep the main elements of the methodology, and they are free to adapt it to your own work style. Always it was and is very important to understand that a change in methodology requires a change in mentality and this takes time.

¹⁵ The following goals in the Project were established and achieved: a) participation of all teachers in courses and preparatory events; b) acceptance of the proposed work in cooperative groups; c) understanding the significance of cooperation as a teaching tool and learning and thus a positive response regarding the acceptance of a new methodological proposal; d) partial and gradual implementation of the methodology; e) adaptation of the methodology to their own working style. Thus, the targets have been established with an expectation that between fifty and sixty percent of the faculty work with students in this more interactive model. In fact, a later analysis of their work showed that always more than eighty percent of teachers and students practiced activities in cooperative groups at different times.

¹⁶ As already mentioned in this chapter, students achieved the highest score in the Ministry of Education evaluation.

¹⁷ At the time of this writing, the Project "Cooperation in Education" more than 5,500 teachers had participated in specific training courses on cooperative learning and 12000 attended lectures on the subject. In all, more than 200 municipalities in 16 Brazilian states (São Paulo, Minas Gerais, Rio de Janeiro, Parana, Rio Grande do Sul, Goias, Distrito Federal, Amazonas, Roraima, Rondonia, Acre, Pará, Amapá, Maranhão, Ceará and Pernambuco) They are given lectures and training courses on "Cooperation in Education".

The formation of a cell cooperative learning seeks to develop activities that include not only the transmission of content, but the development of other social skills such as communication, solidarity, cooperation, teamwork, thinking and evaluating the collective.



Figure 6. The logotype of the project.

7 OTHER STUDIES

These studies about the application of Cooperative Learning in Brazil corroborate and reinforce what other studies presented in the United States, Portugal and Israel had already previously or simultaneously shown. Let us recall some of them:

- a) The study and research of Roger and David Johnson of the University of Minnesota (USA) who reviewed 122 studies on the performance of students in Cooperative Learning¹⁸;
- b) Analyses of Robert Slavin of Johns Hopkins University (USA)¹⁹ who reviewed 60 studies of cooperative learning Cooperative and other traditional methods²⁰;
- c) The report released by the National Center for Effective Secondary Schools of the United States who reviewed 27 studies on the performance in Cooperative Learning of the 6th year (7th grade) at the end of high school²¹;
- d) The research developed in Portugal by Pedro Nuno Bessa Vieira (2000), Celeste Maria Cardoso Ribeiro (2006), Rita Ramos (2008), Lucia Maria Pereira Gonçalves (2010) and Joan Izabel Dias Moreira (2012), the result of practical applications cooperative learning²²;

¹⁸ JOHNSON, D. W. et al. The effects of Teaching Models involving Cooperation, Individualism and competition in the personal success of students: a meta-analysis. *Psychological Bulletin*, v. 89, n. 1, p. 47-62, jan. 1981.

¹⁹ SLAVIN, R. Research on Cooperative Learning: Consensus and controversy. *Educational Leadership*, v. 47, n. 4, p. 52-54, dec. 1989-jan. 1990.

²⁰ SLAVIN, R. *Academic Success and Learning Cooperative: Organization of the School and the Classroom*. New Jersey: Hillsdale/Erlbaum, 1989.

²¹ NEWMANN, F. M.; Thompson, J. *Effects of Cooperative Learning on Academic Success in Secondary Schools: a research summary*. Madison, Wisconsin: University of Wisconsin, National Center on Effective Secondary schools, 1987.

²² The saying of Celeste Maria Cardoso Ribeiro's thesis, entitled "Cooperative learning in the classroom: a strategy for the acquisition of some cognitive and attitudinal competencies defined by the ministry of education - A study of students in the 9th grade" (2006) Lucia Maria Pereira Gonçalves, "Cooperative learning: contribution to the improvement of cognitive and social skills of students with and without SEN" (2010), and research Rita Ramos, entitled "Cooperative learning in the teaching of Natural Sciences - the STAD method" (2008), presented at the University of Tras-os-Montes and Alto Douro, in Vila Real, Portugal. The master's thesis Pedro Nuno Bessa Vieira, "alternative

e) Research conducted by Yael Sharam and Shlomo Sharam in Israel with Research Groups to expand the Cooperative Learning²³.

8 PROSPECTS

Robert Slavin said in the summary of his research on academic achievement in cooperative learning, cooperative methods that incorporate goals and targets in working groups associated with individual responsibility, considerably accelerate student learning: "(...) there is a strong positive effect between the function groups of cooperative learning"²⁴. He concluded: "Current knowledge is more than enough to justify the use of cooperative learning as a central element of teaching and as a necessary routine in schools."²⁵ In addition to promoting learning skills and interpersonal values and improve academic performance, researchers David Johnson and Roger Johnson concluded that cooperative learning promotes improvements and growth of self-esteem and positive attitudes toward the school and with teachers²⁶.

The challenge of cooperative learning implementation is presented as an educational mission to the education idealists. Gradually, the traditional education will making room for a more humane education, more collaborative, where individual efforts add up to solidarity, to share, to cooperate - these are the main gears. The examples cited are tremendously encouraging because even though they have that much to do, bringing a good message: much has been accomplished in terms of cooperative learning in Brazil.

teaching and learning strategies in mathematics: empirical study of an intervention with use of cooperative learning in the context of Vocational Education' (2000) and Master's final reports in Teaching History and Geography, directed by Joana Isabel Dias Moreira, entitled 'Cooperative learning: Application to 8 years of education in the discipline History' (2012), the University of Porto (Portugal). The five studies clearly show gains in performance of individual students, growing interpersonal skills, improved self-esteem and the development of various abilities of academic preparation and professional and personal values.

²³ Yael Sharam and Shlomo Sharam showed that cooperative learning can further enhance the potential of cognitive learning of students to challenge them to carry out research and academic research with individual responsibilities that will then be shared in groups. The study is summarized in the article: Sharam, Yael and Sharam, Shlomo. Research groups expand the Cooperative Learning. Educational Leadership Magazine. USA, Virginia, December 1989, January 1990. Yael Sharam served as coordinator of Television Professional Training Center of Israel and Shlomo Sharam was Professor of Educational Psychology at the University of Tel Aviv.

²⁴ SLAVIN, R. Cooperative Learning: application of teaching model in schools with Learning Difficulties. *Journal of Social Issues*, v. 41, n. 3, p. 60, 1985.

²⁵ SLAVIN, Idem.

²⁶ JOHNSON, R. T. and DAVID, W, already cited.