



TITLE

STRATEGIES FOR THE APPLICATION OF ACTIVE LEARNING

Subtopic:

Active teaching through Cooperative Learning

Author:

Betty Abaroa Godoy*

Universidad Católica del Norte, campus Coquimbo.

Larrondo 1281. Coquimbo. Chile.

*Email: abaroa@ucn.cl

Translation: Carolina Henríquez



SUMMARY

Cooperative Learning, AC (in spanish) is one of the active learning strategies, that to be implemented it needs that the professor has a full comprehension of its five components, that he designs learning-teaching experience, and that he patronizes the class environment. In this regard, we offer a summary of the experience taken from the training of professors and student assistants, where the AC was assumed as the axis from which the class activities are designed and put to practice, and where the investigation of the pedagogic practice is considered essential to improve the curriculum.

KEY WORDS

Cooperative Learning, AC – Basic components of the AC – Cooperative Learning Techniques (Formal and Informal) – Training Program – Evaluation – Methodological Strategy.



INTRODUCTION

The progressive implementation of the learning-centered education approach requires the introduction of changes in the processes of learning-teaching that are given in our university classrooms. In this context, the active learning, and specifically the **Cooperative Learning, AC**, arise as ways to maximize the learning of our students, for they overcome the competence and individualism that are characteristic of the traditional teaching models (Johnson, Johnson, & Johnson. 1999).

Taking this into account, the objective of this paper is **to share some experiences and thoughts on the cooperative learning** that we have been applying and promoting in the training programs we offer to our professors and student assistants in the Universidad Católica del Norte, UCN, campus Coquimbo. Also, **to share how, despite the good evaluation that we have received, we have continued to investigate so we can improve the learning** of our users (within the frameworks that the program design has allowed us).

There are two main ideas that lie within this presentation:

- An initial training experience for the university teaching will be shared, that tries to *stimulate and help professors in a long term effort to continuously improve their competence in the use of cooperative learning* (Johnson, Johnson, & Johnson. 199, pg. 10)
- It is assumed that there could have been mistakes in the development of the curriculum, and therefore, in the training delivered. Thus, we have assumed as part of the training process that we offer the need to investigate and to perfect ourselves, testing ideas and assumptions in a systematic and deliberate way, in this case to improve the learning of our professors and student assistants. Stenhouse (2010)



BUT, WHAT IS COOPERATIVE LEARNING?

The Cooperative Learning, AC, is much more than just a strategy. It is a teaching approach, or *one of the most important educational practices and coherent with the needs of the current college education*. This, because it has a wide theoretical base sustained in three theories: *Theory of the Social Interdependence; Cognitive-Evolutional Theory; and Behaviorist Theory*.

The AC is based on the idea that the cooperation between students, where **the professor patronizes the class environment** so that the students *work in a cooperative way in small groups, ensuring that all the members master the assigned materials* (Johnson, Johnson, & Johnson. 199, pg. 3). Thus, the authors themselves point out that *the cooperative learning is the educational use of small groups that allow students to work together, so as to improve their own learning and that of others* (Op. Cit. Pg. 6).

But to encourage our students to sit together to develop homework does not ensure that they will learn. For the AC to really have the expected results, we must overcome the traditional teaching model, and for that **it is necessary that the professor considers and ensures five conditions or basic components of the AC:**

- ✓ Positive interdependence: Success happens only if everyone else also reach it. This can be fulfilled applying strategies such as:
 - Joint incentives: each member gets extra points if all their peers reach a high level of achievement.
 - Resource allocation: Resources, information or other materials are distributed, and they will only be helpful if shared.
 - Complementary roles assignation: such as secretary, moderator, etc., to each different group member.



- ✓ Face to face interaction: it refers to an extensive promotive interaction, where the dynamics of the task implies continued and direct interaction between the members.
- ✓ Individual and personal responsibility so as to achieve the group goals: each member not only responds for its own learning, but also for its peers.
- ✓ Interpersonal and small group skills: each member must acquire, develop and use basic skills of team work.
- ✓ Group prosecution: it implies the result and process evaluations frequently and periodically, so as to improve its future efficiency.

These conditions make the cooperative efforts more productive than the competitive and individualist efforts. But these conditions do not arise spontaneously. **The professor must achieve a full comprehension of each and every one of them.** Only this way he will be able to:

- a. Take the existent activities, programs and courses and structure them cooperatively.*
- b. Adjust the cooperative learning activities to the different educational, circumstances, programs, subjects, and student needs.*
- c. Diagnose the problems that some students may have while working together, and intervene so as to improve the efficiency of the learning groups. (Johnson, Johnson, & Johnson. 1999, pg. 6)*

That is to say, besides the comprehension of the components, **the AC implementation in the classrooms requires an adequate design**, taking full advantage of the professors and students resources. On the other hand, an inadequate design and implementation will affect the learning and could favor the appearance of resistance or non-beneficial learning for our students.

PROFESSORS AND STUDENT ASSISTANTS TRAINING PROGRAMS, UCN



The training programs in my charge this past three years at the UCN capus Coquimbo, are: Initiation of University Teaching Program, PIDU, addressed to new professors; and the Induction to Student Assistants Program, PIA, addressed to undergraduate students that develop Assistantship Teaching. Both programs, which are voluntary, have been created to support professors and student assistants in the development of **competencies associated to the learning- teaching process design and the evaluation of the learning**, in a basic accomplishment or introductory level. This, of course, making a difference and emphasizing the themes related to roles and functions of the professors and student assistants that assist to the program [at the bottoms there is an appendix with thoughts about what we understand, or should understand, for student assistants].

The programs are given in a semi virtual way, that is to say combining 9 hours of classroom-based training, and 7 hours of self-work in a virtual space available at the 'Educ@ 2.0' Platform, which gives the information in different ways such as: Learning Sequences, Orientation, Forum, etc.

Some learning results of the programs are:

Initiation of University Teaching Program, PIDU

- Module I: Being part of the teaching Staff of UCN.
 - Meditate in the teaching practices, in the context of the Institutional Educational Project.
- Module II: Teaching Practice at UCN.
 - Design learning experiences using cooperative learning techniques.
 - Meditate on the evaluation strategies coherent with UCN educational program, and its applicability according to the course characteristics, learning results, and teaching strategies.

Induction to Student Assistants Program, PIA

- Module I: UCN Educational Project



- Identify the main units and tools that support teaching, offered by UCN.
- Module II: Learning tools
 - Choose teaching and learning strategies based on cooperative work and learning management.
 - Identify the educational feedback components as resources for the development of student autonomy.

As you can see, the AC appears as content in learning results in both training programs. Thus, for its design and implementation, **the AC has been assumed as a teaching methodology or as an axis from where we can organize knowledge and plan and execute the classroom sessions.** That is to say, from 2011 to this date, I teach AC through AC.

For this, in the classroom sessions or workshops, besides the never missing *Presentation Dynamics (or group games)*, we considered a series of activities that would allow our professors and student assistants to “live” the cooperative learning.

Taking into account the most known AC typology, these are the strategies or activities that were selected, implemented and evaluated in the sessions:

➤ **Formal Cooperative Learning:**

1. Puzzle Technique (Aronson and collaborators):
 - The “initial teams” were put together.
 - Each group was assigned with material.
 - The “expert teams” were put together.
 - The initial teams were brought together again.
 - In accordance with the learning results, and as a final product of the activity, each initial team had to elaborate a graphic organizer, to their choice.
2. Guided or Structured Cooperation Technique (O’Donnell and Dansereau)
[Applied in the last version of the programs]. As it is known, this technique



is made in pairs and is focused in a purely cognitive and meta-cognitive activity.

- We put together pairs (two members of similar characteristics in regard to the assignment they will be given)
- We assigned the material and time for the first part of the reading.
- Then, the first exchange space was generated and defined roles were given.
- A second part of the reading was assigned.
- A second exchange space was generated, switching roles.
- It was kept that way until the text was finished.
- In accordance with the learning results and as a product of the activity, the members had to elaborate a Diagram (**Radial**)

➤ ***Informal Cooperative Learning:***

- Combined expository method: Tutor exposure, combined with questions for the students to answer individually or in pairs.
- Techniques for the management and/or evaluation of learning:
 - graphic organizers (conceptual, radial, mental, or other maps) that are included as a product that has to be elaborated by the AC teams
 - summary tables, such as SQA: “Qué Sé, Qué Quiero saber o aprender, Qué Aprendí”: What do I know, What do I want to know or learn, What I learnt; and PNI: “Lo Positivo, Lo Negativo, Lo Interesante”: The Positive, the Negative, the Interesting.

During the development of the AC activities, the performance of the groups was controlled, and help was being offered, taking care of not intervening with the students work beyond what was needed. Besides, in each session we included proceedings and instruments to evaluate academic criteria (associated to the results of a more cognitive learning) with rubrics, and to evaluate group performance (related



directly with the AC) with summary tables, comparative lists, and semantic differential scales.

PROGRAM RESULTS AND INQUIRIES FOR IMPROVEMENT

As it has been pointed out, the training programs are voluntary. But even so, in these three versions 16 professors and 66 students from different faculties and campus schools have participated and approved the program.

The applied satisfaction evaluation, structured in the Competencies Facilitator, Methodology, Virtual Teaching and Formal Aspects dimensions, have given excellent results: in every one of them the average obtained has exceeded on more than one point the theoretical average.

But, inquiring and analyzing the results in an AC perspective, no specific information was found that could contribute with the improvement of its implementation. This is, because the items included where more targeted towards the coherence, importance and level of the worked themes, more than to the methodology that was used. Because of this, other information sources have been analyzed, such as: products evaluated by the students in the classroom sessions and their own didactic planning of each session. This is a summary of the findings:

a) Summary of opinions on the AC. Source: PNI Table. Section: The Negative.

Participants of the PIDU and PIA Programs, versions 2012-2013 (In the original PNI table the positive, for each activity the positive, the negative and the interesting is shown. Due to space issues, only the summary of the negative aspects is shown)

Year Programs	The Negative
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2012	<i>Needs mutual commitment in a team.</i> <i>It may imply that only some work actively...</i> <i>...there is no work distribution, so not everybody cooperates.</i> <i>There may be differences with the different "characters" to reach an agreement.</i> <i>Some are distracted more quickly.</i>
2013	<i>The time given to each exercise [activity], it may have been too structured.</i> <i>The work group was slow and it had not that good capacity to synthesize what was read.</i> <i>Not always everyone ends up having the same knowledge.</i> <i>It implies having to agree and work together, but in a time I consider to be a little tight.</i>

Through a qualitative approach, with inductive analysis, it is concluded that there is a need for improving in:

- Specifying the meaning of the products and the evaluation of the activities (for example, think over and/or gather opinions regarding the experience or activity made and not in past experiences)
- Check and improve the time given for the AC activities (reduce or adjust the time for the activity; increase the number of AC activities)
- Complement / reinforce other strategies of learning-teaching

b) Program Portfolios

The registers or Program Portfolios were also checked and analyzed. In them, there were found group evaluation registers, products by session, and didactic planning (PD), among others. The PD had notes written by hand that pointed out that *the time assigned for some strategies or activities was inadequate, commonly less than what was planned earlier*. It draws attention that this is very similar to the opinions given by professors and student assistants through the PNI table.

Aiming to inquire and investigate on our own teaching practices, an instrument was elaborated and applied to gather specific information in the AC. The instrument was



called the **Active Learning Questionnaire** (*Cuestionario sobre Aprendizaje Activo*), and its design was considered as a mixed approach, with three different dimensions:

- Applied Methodological Strategies (active and cooperative learning)
- Facilitator Competencies (in the classroom) in regard to these methodologies
- Own perception of the user in regards of how he felt during the AC sessions, the transfer of what was learnt, among others.

For its elaboration the Google Docs tool was used, and it was sent through email to all the professors and student assistants that attended the classroom sessions of the programs, in the versions 2011, 2012 and 2013.

Next there is a summary of the quantitative results and examples of qualitative results, found to this date:

- **Summary of quantitative results, Active Learning Questionnaire:**
 - **Methodological Strategy:** the student assistants positively evaluated the strategies with an average of 3.95, which is above the theoretical average (TA = 3), highlighting that the assignments made favored the practical application of the selves (TA = 4.0). On the other hand the professors evaluated with an average of 4.6, also above the theoretical average (TA = 3), highlighting that they were able to “live” some of the principles of the cooperative learning (TA = 4.8).
 - **Facilitator Competencies:** the student assistants positively evaluated with an average of 2.84, above the theoretical average expected (TA = 2). The professors evaluated this dimension with an average of 2.92, above the theoretical average expected (TA = 2). For both groups, the most valued aspect was that *collaborative work between the session attendees was encouraged* (TA = 3).
 - **Own perception:** the student assistants said that the learning of their students was improved, after innovating and applying what they learnt in the program,



with an average of 2.61, above the theoretical average expected (TA = 2). In the professors this value was of 2.75, above the theoretical average expected (TA = 2).

➤ **Examples of Answers to open questions in the Active Learning Questionnaire.**

Question / Theme	User	Opinions / Own perceptions
¿In which aspects of my performance I have been able to apply some of the things I learned?	Professors	➤ <i>In theoretical and practical classes.</i>
		➤ <i>I have planned my courses using the methodology learned in class.</i>
	Student assistants	➤ <i>I upgraded my activity planning</i>
		➤ <i>I managed to develop colaborative learning in the program...</i>
Session aspects to improve (classroom work)	Professors	➤ <i>... while checking tests: I give feedback to my students pointing out the mistake and correcting them</i>
		➤ <i>[There are none...]</i>
	Student assistants	➤ <i>Time extension...</i>
		➤ <i>...level of promotion of the program restricts the possibilities of more people joining in.</i>
		➤ <i>... methodologies that complement the one that is being taught...</i>
		➤ <i>... techniques for assistantships that contain numbers... [for engineering careers]</i>
		➤ <i>Improve the teaching of evaluation techniques...</i>

Using an inductive analysis of the answers, the next categories were established:

Learning that was possibly transferred (according to own perception):

- ✓ Planning of situations of learning – teaching
- ✓ Implementation of new teaching strategies (related with the AC)



- ✓ Formative evaluation aspects or feedback (specifically given by the users of the 2013 version)

Positive aspects on the sessions or classroom work:

- ✓ Cooperative Learning
- ✓ Teaching Competencies

Aspects to improve:

- ✓ Program promotion
- ✓ Program Design: Time/Duration; extension and session schedules.
- ✓ Include/Strengthen other methodological strategies (for example, combined exposure classes; specific for each discipline; etc.)
- ✓ Overall evaluation of the Program

CONCLUSION AND PROPOSALS

In education, it will always be necessary to inquire on what can be improved. Specially when it comes to approaches, strategies or innovative techniques, in which we found ourselves just beginning their implementation. In our case, we already know that these improvements should point towards: Program Promotion; Program Design (Time/Duration; extension and session schedules); Include/Strengthen other methodological strategies (for example, combined exposure classes; specific for each discipline; etc), among others. All these have been collected thanks to the inquiry and investigation on the practice itself, which is fundamental in the professional teaching development.

From this experience, the recommendations to promote active and cooperative learning are:

- Teach AC, through AC: maintaining the coherence between curriculum and didactic will favor the accomplishments of our students. Even more when it comes to the training of university professors, who can make transference to the classroom, favoring a larger number of students.



- Group process or own evaluation: the students must think about and evaluate their team work, so as to favor their social and cooperative skills for further activities, developing on the way other skills such as meditation and critical thinking.
- Implement AC in several curricular activities (vertical implementation): this will favor not only the skills and learning of the students, but also the competencies and skills of the professors and assistants applying active learning strategies such as AC.
- Importance of the professor role: In an innovative and enhancing methodological strategy as the AC, the participation and active meditation of the professor is needed, as a designer of the Didactic Planning and mediator of a classroom environment fit for an effective AC learning to happen.
- Inquiry and investigation of our own practices: having good approval ratings or satisfactory evaluations does not indicate the improvements or innovations that must be applied. Only with a constant meditative and investigative attitude, coherent with the institutional educational principles, professors can go forward towards a real improvement of our students learning.
- Elaboration of course or Programs Portfolios: this instrument will also provide the concrete and valuable evidence of what really happened in the classroom, and therefore, evidence of what and why improve. It is not important whether the “portfolio” is manual or virtual. The important thing is that it reflects the result of the strategies and techniques applied, of the times assigned, the chosen resources, etc.

For students, assistants and university teachers the message must be clear: learning with others and from others is inherent to the human being, and this learning increases if it is with the guide of an adult or in collaboration with others (that can be more capable or have different capacities), where their own peers will have a very important role.

Finally, the active learning and the AC could be the strategies from which the expected results of the new curricular designs, that these days chilean universities are developing, can be obtained. This would surely improve the approval, retention, and graduation, which are so important. But to associate new curriculums with new learning-teaching strategies is not enough. The classroom innovation or implementation of new and better didactics



already has enough support so as to wait for the curriculum to adapt or be updated. Our students are here and now, preparing for the future. We cannot make them wait.

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Appendix:

Essay: What are we talking about when we refer to student assistants?

[Extract from Assistantships in the Chilean Superior Education (Ayudantías En La Educación Superior Chilena)]

Responsible Author: Betty Abaroa Godoy.

When talking about *teaching in charge of classmates*, more than as a role or specific function, it must be assumed as a **teaching method** Biggs (2006). The same author states that *“teaching in charge of classmates is a very powerful teaching method, that is underused to a large degree, although is very effective in a wide set of objectives and contents, and for students of different levels and personalities. It is also easily adapted to bigger classes, transforming a five hundred student class in a group of five hundred auxiliary teachers”*. (Biggs 2006: 144) And he reaffirms it by mentioning McKeachie and Cols. (1986), who states that *the second best (teaching method) is when students teach other students*.

On the other hand, Ken Bain (2007) states with clear educational evidence that one of the main issues to increase the learning accomplishments in students is that the professors *expect more from students with lower grades*. As an example, he describes the implementation of a program addressed to students with lower grades. This program was referred to as an “excellence work”, contrary with what is usual, like “review classes” (for



disadvantage students). Bain explains that the program consisted in weekly work meetings, in groups of five or six students, to address advanced and “conceptually succulent” issues. The original program “used” post graduate students to ease the sessions. But those responsible for the program *“decided to use carefully selected pre graduate students, which had taken the class the year before. They wanted students that had been successful and demonstrated great interpersonal skills. Finally, they asked the teaching support center to prepare these students with advanced helping techniques (such as making questions instead of explaining), and then they met with the student assistants once per week, to go over the problems”* (Bain. 2007: 95)

In this example, the previous idea of Biggs is reassured, that having pre graduate student assistants is a teaching strategy that the professor designs to maximize the student’s learning. In this case, Bain even gives certain conditions of how to organize the assistantship and what specific characteristics must the assistant have.

To move forward in the search of teaching excellence and improvement of our student’s learning, it is crucial to assume that the assistantships given by pre graduate students will be part of the teaching strategies that the professor selects and encourages. On the contrary, if this is not assumed, we will continue to “use” assistants to do the work that the professor should do.

Considering the contributions of these authors, the assistantship that a pre graduate students does could be defined as a process of assistant or tutoring in charge of students from other grades or even classmates, where they interact and co-build their learning, guided by the professor. This way of analyzing the assistantships, this approach, is what appears to be missing in the assistantships models that are being developed in our country, to be clear in what are the roles of each of them. Also, it would have an impact on the student assistants training programs, and in the university professors programs. It is only left to ask ourselves, how many professor training programs includes assistantships as a strategy or teaching method?



It seems, then, that in the context of the Chilean superior education, we are missing the definition of the approach and assistantship model that each institution will apply to 1) guide their professors, 2) train the student assistants, and 3) develop the assistantship itself.