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Analysis of the Effects of the Implementation of Cooperative Learning in Physical Education

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Analysis of the Effects of the Implementation of Cooperative Learning in Physical Education

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Abstract

Our research was oriented to test the effects of a structured program of cooperative learning in Physical Education classes with students in grades 5 and 6 of primary school, with and without previous experience with this methodology. In a second phase we sought to determine how students perceived the received classes for a time later. We analysed data collected during implementation, through cooperative learning, of two teaching units to a total of six groups of students; in addition, a number of interviews, five individual and one collective, were carried out to a total of 10 former students who had left school between one and five years earlier. The results show the positive effects of cooperative learning on students' motor performance, and some social achievements such as a greater autonomy of the students in the learning process, an increasing in prosocial behaviours and the inclusion of pupils with special educational needs. On the other hand, as time went on, the students rated the received classes as cooperative, participatory, funny and useful, emphasizing peer support as a key factor that enabled them to learn in Physical Education.

Keywords: cooperative learning, physical Education, inclusive education, motor achievement, social achievement

In the early 90's the implementation of cooperative techniques in the subject of Physical Education (P.E.) was something alternative and rare, limited to occasional cooperative games. At best, it was limited to the implementation of a learning unit focused on cooperative activities but normally with a small connection to the rest of the syllabus. To some extent, it appeared as an island where students experienced cooperation but soon they returned to the immense ocean of traditional methods based on competitive or individualistic approaches for the lessons.

As this situation has currently changed, we can state that the number of publications on the use of cooperative practices in P.E. lessons has increased significantly. This fact is contributing not only to facilitate its implementation (Gil & Naveiras, 2007, Fernández-Río & Velázquez, 2005; Velázquez, 2010) but also to its integration as any other resource in the syllabus of P.E. (López-Pastor, 2009; Álvarez, Bernabé & Garcia-Garcia, 2010).

Nevertheless, the use of planned samples of cooperative learning in P.E. is still rare, in spite of the use of cooperative games aimed at working on different motor skills contents or even in spite of diverse proposals for activities based on team work, (Dyson, 2001). Some teachers wrongly associate group work with cooperative learning even though several authors have clearly specified the differences between both concepts (Marin & Blázquez, 2003; Pujolás, 2008). Other teachers associate cooperative learning with cooperative play considering them synonyms although the differences between these terms have been explained as well (Velázquez, 2004a, 2010, 2012).

Cooperative learning is an educational methodology based on working in small and usually heterogeneous groups, in which students work together to expand or hone their own skills and those of other group members (Johnson, Johnson & Holubec, 1999; Velázquez, 2010). We would like to emphasize the key point of the definition, which characterizes cooperative learning and differentiates it from group work: the concern of every member of the team, not only about himself or the task at hand but also concerning each of his peers. Metzler (2011, p.

227) defines it as a methodology in which “students learn with, from and for their peers”. Besides, it is included among the eight models of instruction applied in P. E. which he considers, as he pointed out, more than a model itself; cooperative learning involves a set of teaching strategies implying its own defining characteristics.

In recent years, there have been several studies focusing on the implementation of cooperative learning in P.E. that demonstrate their effectiveness in: (a) promoting the integration of students with disabilities (Cervantes, Cohen, Hersman & Barrett, 2007; Grenier, Dyson & Yeaton, 2005); (b) improving social skills and interpersonal relationships (Barba, 2010, Dunn & Wilson, 1991; Dyson, 2001; Fernández-Río, 2003; Goudas & Magotsiou, 2009; Polvi & Telama, 2000, Velázquez, 2004b); (c) promoting students' self-concept (Fernández-Río, 2003); (d) promoting autonomy and teamwork ability (Velázquez-Buendía, 1996; Velázquez, 2004b, 2006); (e) increasing levels of fitness (Grineski, 1993); (f) generating motivation for motor exercise (Barba, 2010; Fernández-Río, 2003; Velázquez, 2006); (g) improving behavior in classrooms (Barrett, 2000, 2005, Dunn & Wilson, 1991; Velázquez & Fernández-Arranz, 2002); and (h) promoting motor performance (Bähr, 2010; Barrett, 2000, 2005; Casey, 2010; Gröben, 2005).

Thus, we can say that there is sufficient empirical evidence showing the achievements of cooperative learning in comparison with traditional teaching models based on competitive or individualistic approaches (Fernández-Río, 2003; Goudas & Magotsiou, 2009; Gröben, 2005).

The aim of this research was to test the effects obtained when implementing a well-defined program of cooperative learning in P.E. lessons with students belonging to the third cycle of Primary Education, with and without previous experience with this methodology. In addition, we sought to determine how students perceived P.E. lessons based on cooperative learning over time. With all this, we tried to take a step forward in a currently unexplored field of research. The reason was that, in spite of our efforts searching, it was impossible to find any study showing what memories endure from the use of cooperative learning in the classroom after having stopped working with this methodology.

Methodology

Context

The research took place in a state school located on the outskirts of a provincial capital town of Castile and Leon in Spain. Data from P.E. lessons which were based on cooperative learning through the delivery of two didactic units taught by a single teacher were collected and analyzed. One of the units, aimed at learning individual and pair rope jumping was developed with students belonging to year 5 at the Primary Stage. The other one, aimed at learning the basics of acrobatic gymnastics, performance of routines in pairs, and the creation of new routines, was conducted for students in year 6 of Primary Education.

Implementing the Didactic Units based on Cooperative Learning

The didactic unit “rope jumping together” was developed with students in year 5 of Primary Education with no previous experience in systematic cooperative learning. According to Pujolás (2008, pp. 154-155) “before introducing cooperative learning, the group must be minimally prepared gradually creating a favorable atmosphere for cooperation, mutual help and solidarity.” In this sense, we followed the recommendations given by León (2002) and a unit of cooperative games and group dynamics was developed before working on cooperative learning. It was aimed at determining the level of social skills and group cohesion among students and presenting the logical structure of cooperative processes. Consequently, the teacher reinforced any helping, supportive or cooperative behavior manifested in the classroom.

The unit was delivered through a cooperative learning method named “Learning Teams” (Grineski, 1996), with teams of 4 or 5 students. Here the teacher provides an explanation of the motor skills to be developed, indicating to the students their achievement goals. Then, the students work on different teams in which each member plays a specific role: note taker, supporter, equipment keeper, task manager... In our case, each student played a different role in each of the sessions throughout all of them along the teaching unit. Finally, students were assessed and

marked according to the level of attainment of the goals before mentioned and bonuses or penalties were consequently assigned to the teams.

A set of teaching resources aimed at promoting the autonomy of the different cooperative learning teams were designed for the instruction of the unit. These were a document of goals and personal duties, a working outline or working guide as well as some control tables. These tables were filled by the team during the lessons in order to meet two objectives: (a) to provide information to teachers about their students' individual and collective achievements and (b) to promote the different collaborative learning teams to process information together and to make decisions based on the work done.

The structure was developed in an initial session, devoted to present to the students the goals of the didactic unit, the line of work and the resources. Then, all of the teams took part in three lessons of P.E. per week: two one-hour sessions and one half-hour session, for one month. The one-hour sessions took place in two different stages. The first was aimed at achieving the goals of individual and pair rope jumping by working in learning teams for 20-25 minutes of actual practice. In addition, they spent 5-10 more minutes to fill the documents. For the second session, the students worked on suggestions for collective rope jumping facing the challenge in a cooperative way either as a whole group or divided into two teams. During the half-hour sessions, the students worked on collective rope jumping.

After the first two weeks, students took an individual rope jumping test and two weeks later a pair rope jumping test taking into account that the individual marks affected the group as a whole. Consequently, if the whole learning team could exceed the set goal, they would get bonuses depending on the level of attainment. On the contrary, if one of the team members did not reach the goal, the rest of his team mates would be penalized. Prior to beginning the task, the students were informed that the final mark would depend not only on the results of the jumping tests but also on the work done during the classroom sessions. It would depend on the degree of commitment to the personal duties, on how well the time was used and on their helping attitude within the learning teams. In other words, the process would be valued as much as the result.

The didactic unit on acrobatic gymnastics was developed, also through learning teams, with students in year 6 of Primary Education who had already worked with structured cooperative learning for the previous year. The unit consisted of ten sessions of one hour per week. The same way as in the previous case, a set of learning resources was also designed including a document for goals and assessment criteria and some worksheets on acrobatic gymnastics routines. They were designed to promote the processes of self and peer assessment within the teams.

The first session was again devoted to explain the process and the materials. Then, the second session was delivered. The safety rules when performing acrobatic gymnastics were explained and it was confirmed that the students had understood them. Following, they were freely grouped into pairs and three pairs were grouped together in order to form each of the learning teams. The students worked on creative production of acrobatic gymnastics routines in pairs throughout four sessions. They were always assessed by another pair belonging to the same learning team. After the four sessions this process was assessed according to the number of acrobatic gymnastics routines that were properly performed.

Finally, we developed a second part of the learning process through the collaborative creation of collective acrobatic gymnastics routines by the students themselves. The process was evaluated and graded according to the quantity, originality and difficulty of these routines.

Prior to the development of the didactic unit, one out of the three teams in each class of year 5 was randomly chosen to decide freely how to group their learning team, providing that it was decided reaching a consensus. In the other two groups, the teacher formed the teams according to diversity criteria in gender, ethnicity and initial level of motor skills. These criteria were combined with elements of social-affective skills. For instance, children with more difficulties in relating with others were placed in the same group with children who had more pro-social attitudes, while two children with a tendency to be distracted from the task were prevented from being together. The process was the same for the teams of year 6 but in two of the teams the students made the teams freely and the teacher created the remaining teams with the couples who were already formed.

Data Collection

The research was conducted in two stages. In the first one, we analyzed the teacher's diary corresponding to the development of the before mentioned two didactic units where cooperative learning was implemented: "rope jumping together" and "acrobatic gymnastics". This information was supplemented by analyzing the syllabus, assessment tools, qualifications records, student worksheets and notes, thoughts, and statements collected from various student notebooks that caught the teacher's attention. We also analyzed the diaries of four outside observers (two student teachers who were in their training time and two P.E. teachers) who observed the classroom during the didactic units and who carried out fourteen individual interviews that were made to different students during the unit "rope jumping together".

At the second stage of the investigation, we interviewed five former students, 3 boys and 2 girls, individually and in a semi-structured way. Each of them had finished Primary Education in a different year throughout the last five consecutive years. In addition, a group interview with 5 former student, 2 boys and 3 girls, who had left school two years ago in order to start Secondary Education, was also conducted. Accessibility to families was the criteria for the selection of students. In all cases the procedure was the same: first, the parents were informed about what we wanted to investigate; then, their availability was considered; we asked them to discuss the process with their son or daughter or to allow us to do it. Once the student showed willingness to participate in this research, we set a place, date and time for the interview.

Data Analysis

In the first phase of the research, the analysis of the data was focused on determining the main effects of the implementation of cooperative learning in P.E. lessons. Taking the theoretical framework as a starting point (Johnson & Johnson, 1999; Slavin, 1999; Velázquez, 2010), we focused on the benefits of cooperative learning in two major fields: achievement in motor development which is characteristic of the area of

P. E., and achievement in social learning, improvement of social skills, development of social skills... Moreover, affective accomplishment was also considered, such as positive manifestations of a student to succeed in a task with a certain level of difficulty.

Thus, we decided to start from the quantitative results obtained in the tests designed to determine students' motor performance in order to assess their motor development, for instance, in activities such as rope jumping and acrobatic gymnastics. Subsequently, this data was supplemented with other information not only on the progress of the children but also on the difficulties that they were overcoming during the learning process. This data was taken from the teacher's diary.

In order to identify the social and emotional achievements, priority was given to the resulting data from the triangulation of the teacher's observations along with those of the outside observer as well as with data from the interviews with students. The information obtained was supplemented with data from some teams' assessment tools such as rubrics designed to determine the degree of cooperation or a survey to check the acceptances and repulses within the team.

The data analysis began with the identification in the texts of relevant data to the core topic which we are interested in: different effects of the implementation of cooperative learning in the classroom. This was followed by a second analysis of the data, organizing it into a set of emerging categories which facilitated its treatment.

The second phase of research focused on the content analysis of individual interviews and the collective ones. They were carried out with former students in order to find the answers to three questions: what do the students remember from the P.E. lessons at school?, how is their perception of the lessons? and what are the differences between the P.E. lessons at school and at high school?

Results

Effects of Cooperative Learning on Motor Development

After the learning process of each of the didactic units developed with cooperative learning, the analysis of the results obtained by the students

reveals that, in general, almost all the students achieved the proposed goals for motor development although that does not happen in all cases.

The following tables show the results obtained by different teams of cooperative learning in individual and pair jumping rope and in collective acrobatic gymnastics routines. These grades were based just on the results obtained by the different groups in the rope jumping and acrobatic routines performance tests. Therefore, it does not correspond to the final grade of students. As we have already noted, other factors which have to do with the learning process as well as bonuses and penalties obtained by the teams based on the results of their individual members were also taken into account for the final grades.

Table 1

Grades obtained by students in each of the objectives for rope skipping

	Individual Jumping	Pair Jumping	Average
<i>Group 1</i>	8,14	7,53	7,84
Learning Team 1	7,41	6,55	6,98
Learning Team 2	8,80	6,20	7,50
Learning Team 3	7,73	7,06	7,40
Learning Team 4	9,02	9,19	9,11
Learning Team 5	7,76	8,68	8,22
<i>Group 2</i>	7,47	6,37	6,92
Learning Team 1	8,40	8,76	8,58
Learning Team 2	6,27	3,43	4,85
Learning Team 3	6,54	4,69	5,62
Learning Team 4	7,74	7,02	7,38
Learning Team 5	8,40	7,94	8,17
<i>Group 3</i>	7,79	7,46	7,63
Learning Team 1	6,81	6,18	6,50
Learning Team 2	7,52	7,34	7,43
Learning Team 3	7,40	7,16	7,28
Learning Team 4	8,96	8,80	8,88
Learning Team 5	8,26	7,83	8,05

Table 2

Grades obtained by students in creating collective acrobatic gymnastics routines

Group 1	Grade	Group 2	Grade	Group 3	Grade
Team 1	8,17	Team 1	3,50	Team 1	4,50
Team 2	8,83	Team 2	5,70	Team 2	6,67
Team 3	5,67	Team 3	7,00	Team 3	6,83
Average	7,56	Average	5,40	Average	6,00

A remarkable fact is that when students with special initial difficulties performed the tasks, their motor performance was much higher than others with a higher initial ability, meeting the learning objectives. This is the case of Pedro¹, a child with important autistic disorders who started from a seriously impaired motor and social level. In fact, as it is recorded in the teaching diary, in the initial session he could not even lift his feet from the ground to jump the rope, "Pedro keeps on receiving support through verbal instructions. I approach them and I give them directions to enable him to jump without a rope but with his feet together and to do it rhythmically."

Taking into account the special difficulties presented by the child, the teacher intervened by adapting the task to make a chance of success possible. The teacher suggested to the learning team that Pedro's goal could be jumping "the little clock" (a person holds a tip of the rope spinning around at the ground level and another jumps when approaching the other tip) since it was virtually impossible for the pupil to be able to coordinate his arms and legs together. "I give Pedro's team instructions to make him try to jump "the little clock" which is an easier task that will demand him to lift his feet from the ground at a certain pace. This is the first thing to achieve." Two weeks later, Pedro managed not only to jump "the little clock" but he also achieved the minimum required jumps, fifteen in a row, without difficulty.

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With respect to pair jumping, we must note that Pedro was able to rise to the same challenge that had been issued to all the students without any curriculum adaptation. The challenge was to skip in pairs more than 15 consecutive jumps performed in three different ways which must have been previously agreed upon by the whole team. Their grade was 8.68.

Finally, we must highlight that the higher or lower academic performance of the learning teams did not depend on whether the teacher was the one in charge of grouping the students (groups 1 and 3 in rope jumping, and group 3 in acrobatic gymnastics) or the students freely on their own (groups 2 in rope jumping, and groups 1 and 2 in acrobatic gymnastics). In fact, the lowest motor performance was found in those teams with more conflicts and less commitment to individual responsibilities. Even all the students who were interviewed considered the systematic failure to fulfill several responsibilities during the working sessions as a fundamental reason for the low performance of their teams.

Effects of Cooperative Learning on Social development

The classroom observations which were recorded in the teaching diary by the teacher and by the outside observers, along with the students' interviews were analyzed in order to test the effects of cooperative learning on social development. It led us to identify three major achievements: (a) greater autonomy in the learning process; (b) increase of social skills and pro-social attitudes; and (c) inclusion of pupils with special educational needs.

Greater autonomy in the learning process

An initial tendency to organize themselves individually or in pairs within the same group was observed in some teams. Consequently, it was written on the external observer's diary corresponding to the first session: "some have not followed the instructions exactly as a team but individually."

Virtually all the learning teams left the individualistic organization as they advanced in working as a team and while the decisions aimed at assisting people with difficulties in the group were increased. These decisions involved in many cases different ways of grouping within the team targeted at reaching the maximum motor performance. Here we have an example taken from the teacher's diary: "Cristina asks if all the members in her team could advance except for a person who would support Carlos. I answer that they could do it like this as long as Carlos had no lack of support." Feedback for peers is sometimes considered as a priority even when it is temporary limiting the motor performance: "Miguel jumps backwards while his teammates are watching him. [...] I approach them and I tell them that several people could jump at once. Yes, but we can control ourselves better like this. "

The degree of autonomy in the teams, and consequently the level of decision making increased as the sessions progressed and as they got used to the innovations of working on cooperative learning. According to the external observer, "waiting times as well as decision-making moments are being decreased as the sessions go by" which allowed the different teams to increase the working time on motor skills.

Increasing pro-social attitudes

Most students tended to support each other, especially when someone expressed any difficulty with the task. The type of aid given was aimed at verbalizing the partner's mistakes, giving directions, suggesting solutions or introducing facilitators. Thus, with regard to Hector's difficulties, "Elena tells him that his problem is that he goes very quickly." There was also frequent positive reinforcement of any achievement as well as encouragement to cope with difficulties. This fact was noticeable to the external observer who wrote in his diary: "motor skills acquired as a team do not limit the progress of the individuals. On the other hand, individual motor skills are always improved not only due to their own personal satisfaction but thanks to the general reinforcement of the team too."

It is also remarkable that in most of the groups very few conflicts appeared and, what is even more important, they learned to find consensus solutions to them. It is stated in the interview to Guadalupe:

- Have you found any kind of conflict during the sessions?
- Yes, I said that we had to jump five times in a row with 15 hops graded or more in order to move to the next one. However, Rocío and Quetzalli said that just three hops.
- And how did you solve it?
- Well... finally, four; neither what Quetzalli and Rocío said, nor what I said.

Inclusion of students with special educational needs

Pedro was included, by elimination, in a group of three girls with a high degree of pro-social attitudes which undoubtedly contributed to the achievements of the child. Some students expressed in a remarkable way the little confidence that his partners had in Pedro's ability to skip the rope, "they believed that he would not be able to jump", "I think it was either because he jumped incorrectly or because he did not cooperate. Well, he was sometimes uncooperative but he has finally jumped properly, like everyone else."

From the first moment, Pedro had the support of his team and they made him assume his personal duties starting with the role of equipment manager because "Rocío says that it is the easiest task and that it is better to start there before playing another more complex role. He is the first one to pick up the ropes and to give them out." A remarkable fact was that the celebration of Pedro's achievements was the same as the collective ones. Positive reinforcement became the engine of learning and this fact was written down by the teacher in his diary: Pedro is trying to skip forward supported by Rocío, who does not stop encouraging him. When he performs a leap, Rocío runs to me to tell me, "he has taken a leap forward!" They try "the little clock" again with his feet together. He got it. [...] Rocío comes up to me in order to show me a sheet with the leaps of their group. She comes with Guadalupe and says, "Look how well Pedro is doing!" Good news! The external observer also highlights the "improvement of all the students in certain motor skills for jumping, rhythm as well as jumping in and out from the rope. The improvement of Pedro was very specially stressed," noting that "I feel that the positive reinforcement of the team is particularly beneficial

to him.” Pedro's achievements in rope jumping helped him to be accepted by his peers for the rest of the motor activities that took place after the didactic unit “rope jumping together.”

Effects of Cooperative Learning on Affective Development

The main effects of cooperative learning on the affective level are found among those students with lower motivation to motor exercise. After the learning process supported by their peers, they achieve goals that they initially doubted they would be able to do. We have just mentioned, for instance, Pedro's success in rope jumping. These results helped to promote the child's proper motivation and the acquisition of a sense of motor competence that he expressed in his essay at the end of the unit:

At first, I thought the task was too much. I could not cope with the small rope. When I tried the long rope, I leaped for the first time in my life. The second one was backward with the small rope, thanks to the help that I received when I jumped in pairs and alone. And I have already mastered the long rope. It is the last frontier, here we go!

Thus, there was a child with special difficulties who established a relationship with his peers and finally, he was able to participate regularly in all the activities suggested during the lessons although his participation in the P.E. lessons with his previous teacher had been merely sporadic, limited to very few specific activities.

And finally... what's left?

We have analyzed the short term effects of cooperative learning, but what is still engraved in the students' memory after working with this methodology as time goes by? We interviewed several people trying to answer this question. The students interviewed had stopped working with cooperative learning when they moved to Secondary Education, having worked with this methodology in school.

Most of the former students who were interviewed emphasized among their memories, didactic units developed through cooperative

learning and other aspects that have to do with cooperation, friendship or fellowship. Consequently, what is most remembered by Carmen (5 years)² was that “most of the times we were grouped among those who were in class”. She stressed that the P.E. lessons helped her to “make friends” and that “apart from doing the exercises, it was more about being opened to the rest of teammates.” This view is shared by Roberto (4 years), who said that he learned in the classroom “to collaborate with peers, fellowship as well as all the juggling exercises and the skipping rope”, contents of which Ernesto (3 years) also kept good memories “I remember a lot the circuits we did, juggling ..., the skipping ropes are really lively memories to me and I had a great time during these lessons too.”

Carolina (2 years) stresses among all the things that she learnt “the team work”. It means that “we always have to say what we believe and listen to each other.”

The mutual aid was spontaneously highlighted as a learning element in the classroom by the students during the collective interview:

Can you remember what the teacher used to do when someone had any difficulty with the task or couldn't do anything?

(Ana) – The teacher helped him.

(Rosa) - Or two partners helped him.

(Andrea) – The teacher asked his friends to help him so they said “do this, you have to be like this”.

(Ana) - That's what you used to say so much. What is what I said so much?

(Ana) – Well, what I've just said, that you told us to help each other. And did it work?

(Various) – Yes, quite well.

(Martin) - I had not ever done a somersault and now I can do it. It is true that it is something that I could not do but you helped me and, as we were all together, now I know how to do it.

Alejandro (1 year) also highlighted that the teacher was not the only one who “was trying to help” with the problems of a partner but “all of us helped”. For example, if he could not jump the rope, those of us who

were better at jumping taught him how to jump in and out from the long rope and you [the teacher] were also one of us.”

The P.E. lessons at school were defined as funny, participative, cooperative and useful by all the interviewees. Consequently, Martin (2 years) reinforced that the lessons let “everybody play.” It was not like football, in which just some people were very good at and others really bad. They were intermediate games that everyone can do” Carmen (5 years) described them as “funny and relaxing” stating that “all of us always enjoyed going to class.” Roberto (4 years) was even more enthusiastic considering it “very funny” and declaring: “I’ve never been in a P.E. class like that.” Carolina (2 years) chose the adjective “cooperative, because we always had to collaborate with each other” and Alejandro (1 year) considered that the lessons were helpful because “there are games where some of the skills needed are now required at high school”.

Big differences were identified by all the students when comparing P.E. at school with P.E. at high school in Secondary Education. The first major difference that was quickly verbalized has to do with losing the sense of entertaining lessons. With regard to this, Alejandro (1 year) complained that at high school “games are hardly ever played, exercise is everything and games were in school. It was better than at high school, much better, because you did the same as in high school but playing.”

A second distinguishing feature is related to the structure of learning. Ernesto (3 years) stressed that lessons at school “were all cooperative practices while, at high school, everything is more individualistic.” This idea also emerged during the group interview, in which students linked this individualistic learning approach to a greater difficulty to learn, compared with the cooperative approach that they had known in school:

(Rosa) – At the high school elasticity is much more emphasized and everything is harder. A bigger effort is required.

(Martin) - It is not a challenge where you are supported. The thing is that you have to do it and you are going to do it because you have to do it. If not, then you fail. In school you are supported and at high school you have to do it so you do it.

(Victor) - In high school everything is more serious. You have to pass and if not ... you fail and, well ... in school you could fail too, couldn't you? But it is more difficult because your classmates and your teacher are helping.

Don't your peers and teacher help you in high school?

(Victor) – They do but not so much. Everything is more serious, more difficult.

The idea of associating the training at high school with a higher level of demand with respect to that one at school, also emerged in individual interviews. So Carolina (2 years) noted that “high school is more demanding, for example, the Cooper test is more strict.” While steady running was just a learning content in the school, it was assessed in high school, so that “here we practiced several sessions before the final one. There, instead of practicing five or six sessions to calibrate ourselves and get fit after a time, we just have one or two sessions.” In fact, students do not relate the level of demand with a higher learning but rather with a higher importance of the physical condition, mainly aerobic endurance and, as already noted, with a lower number of motor training based on games. Carmen (5 years) emphasized, for example, that at high school lessons “are running. You're given a few minutes and you have to run and we rarely have fun. There is no freedom to do things you've never done.”

Discussion

According to the theory of cooperation and competition (Deustch, 1949), a person will tend to compete, cooperate or work individually depending on how this person perceives the relationship between his goals and those of others. Following this theory, the first step in getting people to cooperate would be to create a positive interdependence of goals. In other words, his objectives must be linked together so that he can only achieve them if the rest of the people also reach theirs. This theory was prompted by Johnson and Johnson (1989, 2009) who renamed it as Social Interdependence Theory and it was applied to the educational field by developing the conceptual approach to cooperative

learning. The starting point to promote cooperation among equals is the same, the need for a positive interdependence of goals. Yet, it is indicated that this is a necessary although not a sufficient condition to guarantee it.

The results of our investigation agree with Johnson and Johnson (1989, 2009) since the motor and social achievement were not guaranteed in all the cases, in spite of the positive interdependence of goals, but also even in spite of interdependent resources, roles and rewards. It does seem that, broadly speaking, students were more motivated and made bigger efforts when they could contribute something to the group or when poor performance affected other members of the team. Nevertheless, this was not the same in all cases, which leads us to believe that there are other individual characteristics such as some personality traits, motivation, pro-social behavior, responsibility... that influence the performance of the teams. This would reinforce the results of investigations of León (2002, p. 297) who advocated “the importance of social skills, negative self-verbalization and, above all, certain styles of interpersonal behavior on cooperative learning.” Further studies should be aimed at determining which of these variables have a greater effect on the positive or negative result of students when working on cooperative learning.

The fact that the teacher was the one who formed the learning teams was not a determining factor in the performance of them. We could observe that in the case of teams which are built by affinity but their members fulfilled their responsibilities, their performance is higher. By contrast, it is really decreased when the affinity grouping generates playful or distracting situations from the task. However, most researchers consider the groups which are formed freely by the students themselves the least recommended option (Gavilán & Alario, 2010, Johnson, Johnson & Holubec, 1999) since “students will tend to choose their peers depending on their ethnicity or gender and they will have less willingness to respond as individuals “ (Cohen, 1999, p. 89).

There are other risks such as a team consisting in the students with more difficulties without resources to help reciprocally (Kagan, 2000). Another risk for those teams made of friends could be the lack of opportunities to socialize with others (Putnam, 1997). Then, should the

teacher be the one who builds the groups even though this was not a determining factor in the performance of them as we observed in our study? Perhaps the most suitable thing is the balance in which, not only the interests of students are considered but also the way children are gathered in order to avoid the risks before mentioned. Some proposals are given in this sense. For instance, Marín and Blázquez (2003) proposed the educator to be the person in charge of forming the group after a sociometric testing that allows him to combine variables of friendship along with others of heterogeneity. According to another proposal, the students are who group freely themselves as long as the group meets certain conditions set by the teacher (Velázquez, 2010).

In our research, the groups which obtained the lowest yields were those teams in which some people were distracted from the task, were joking with their teammates, did not assume their responsibilities, were not able to regulate their conflicts and rarely reflected or made decisions aimed at solving the problems that arose. All this leads us to identify individual responsibility as a determining factor to success in cooperative learning, an element that is fully recognized by the leading names in the field (Cohen, 1999, Johnson & Johnson, 1999; Kagan, 2000; Slavin, 1999). Such individual responsibility seems to be facilitated by the development of specific materials for the work of students through cooperative learning as well as the assumption of specific roles by them, although it is not a guarantee. Furthermore, promoting time to reflect on the work done is also recommendable what Johnson and Johnson (1999) called group processing.

Our study showed that interpersonal conflicts were rare when the group had sufficient social skills and there was a concern for everyone, especially for those who had more difficulties. Moreover, in the case of any conflict, it was solved thanks to dialogue and agreement. All this contributed not only to the inclusion of students who had been initially marginalized but also to the motor achievement of those with lower initial ability in the proposed task. This suggests that pro-social attitudes of the students are another factor that contributes towards a high team performance. The clearest example is found in the group that worked with Pedro, the autistic child, who reached the second best results in the jump in pairs when the child was initially unable to lift his feet from the

ground. Social skills are considered by Johnson and Johnson (1999) as one of the fundamental factors for success in the cooperative learning processes, in addition to what they call promotive interaction “that happens when people encourage and promote the others’ efforts in order to achieve activities in favor of the objectives of the group” (*ibid.*, p. 125). These factors are also considered by other authors (Dyson, Lineham & Hastie, 2010; Gavilán & Alario, 2010; Gillies, 2007; Putnam, 1997). Understanding pro-social behavior as without altruistic motivation” (Garaigordobil, 2005, p. 44) and even when it is not exactly mentioned in the alluded works, the conjunction of these two essential factors of cooperative learning with social skills and promotive interaction are not exactly the same, to some extent, but they have a lot of similarities with it.

The different learning teams, in which their components showed pro-social attitudes, took their individual responsibilities, reflected on the work done and how to improve it. In addition, they had enough cognitive resources and social skills to support the learning of their peers, providing feedback that leads them to correct their mistakes. Besides, they far exceeded the motor goals as well as other social achievements. Among these remarkable achievements were the greater autonomy in learning, an increase in social skills and the inclusion of students with special educational needs or more initial difficulties to achieve the task that was intended. The achievement of apparent unattainable motor goals with the support of their peers increased the motivation of these students towards physical exercise and the acquisition of a sense of motor competence. All this confirms other researches in the field of motor skills that shows that, as long as the required conditions are fulfilled, cooperative learning is effective not only in terms of motor performance but also emotionally and socially speaking (Bähr, 2010; Barba, 2010; Barrett, 2000, 2005, Casey, 2010; Casey & Dyson, 2009; Dyson, 2001, 2002, Dyson, Linehan & Hastie, 2010; Fernández-Río, 2003; Goudas & Magotsiou, 2009; Gröben, 2005; Lafont, Proeres & Vallet, 2007; Polvi & Telama, 2000).

Finally, our study explored the perception of P.E. classes based on cooperative learning that endures in the students’ memory as time goes by. In this sense, the students identified the cooperative learning

approach as a distinguishing factor between P.E. lessons in school and those in high school working mainly on an individualistic approach. A second distinguishing feature was the entertaining lessons and positive classroom atmosphere in which they worked, in contrast to those that they were currently working on, more focused on the development of physical fitness, which they described as serious and demanding. They stressed the importance of peer support as a key factor that enabled them to learn in physical education.

Finally, all students who were interviewed described the P.E. lessons at school as funny, participative, cooperative and useful. This leads us to conclude that students keep a pleasant memory of the P.E. lessons based on cooperative learning and that they are aware of the fact that they helped them to develop motor skills but also to interact with peers. In any case, we could not find any studies to compare our findings, therefore, it should be viewed with caution awaiting further research to be developed in this regard.

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Notas

¹ Throughout the text we will use pseudonyms to identify the different students.

² Along with the pseudonym of a former student is included, in brackets, the number of years that has elapsed since leaving school.

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