Cooperative Learning in Physical Education

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Abstract: The purpose of the study is to understand and analyze the conception of cooperative learning (CL) of a group of Spanish Physical Education teachers who are recognized as leaders in this methodology, as well as how they implement it in their classrooms. It is a multiple-case study using interviews, non-participant observation and documentary analysis. The results indicate that all participants know the general principles of AC and use it, conceive it as an important methodology to advance in different areas of learning, consider that any content can be taught with CL, and value the importance of formative and shared evaluation.
Keywords: Learning. Evaluation. Qualitative Research.

1 INTRODUCTION

Cooperative learning (CL) is an educational methodology based on working in small groups, usually heterogeneous, in which students work together to improve their own learning and that of other members of their groups (JOHNSON, JOHNSON; HOLUBEC, 1999). According to the conceptual approach (JOHNSON, JOHNSON, 1999), CL implies five essential characteristics during group work: (1) positive interdependence of goals, which can be supplemented with others such as resources, roles and identity, (2) face-to-face interaction, (3) individual

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accountability, which means that no one can be passive and hide behind the work of others, (4) interpersonal and small group working skills, (5) group processing or the process by which the group identifies behaviors expressed during the development of the task, determining which of them contributed to achieving it and what detracted from it, in order to reinforce the former and propose alternatives to the latter. Currently, CL is considered an important teaching and learning strategy that promotes academic, social and affective-motivational achievement for all students, including those with special educational needs (GILLIES, 2006).

2 COOPERATIVE LEARNING IN PHYSICAL EDUCATION (PE)

Metzler (2011) considers eight models of instruction applicable in today' PE classes: direct instruction, individualized teaching, reciprocal teaching, discovery-based teaching, sports education, tactical games, teaching of personal and social responsibility, and CL. CL's defining element is that students work in small groups to learn with, from and for their peers.

CL always involves group work. Now, this group work must be carefully structured so that all students will interact to exchange information and be individually evaluated for their work (FATHMAN, KESSLER, 1992). In short, what identifies CL, what distinguishes it from mere group work is each student's responsibility for his or her own learning, but also and especially for that of each and every member of the group.

Different authors stress the advantages of implementing CL in PE classes to promote learning and motor performance (ANDRÉ, 2012; BÄHR, 2010; BARRETT, 2005; CASEY, 2010), develop social skills and improve relations among students (DYSON, 2001; FERNÁNDEZ-RÍO, 2003; GOUDAS; MAGOTSIOU, 2009; POLVI; TELAMA, 2000), promote the inclusion of students with disabilities (ANDRÉ; DENEUVE; LOUVET, 2011; DOWLER, 2012; GRENIER; DYSON; YEATON, 2005; VELÁZQUEZ,

2012a), improve overall and physical self-concept (FERNÁNDEZ-RÍO, 2003) and motivate students toward the motor practice (BARBA, 2010).

The analysis of research on CL in PE reveals that most studies are aimed at comparing the effectiveness of this approach to other forms of structured learning (ANDRÉ, 2012; FERNÁNDEZ-RÍO, 2003) or analyzing CL's efficiency to achieve different motors social or affective-motivational goals (DYSON, 2001; DOWLER, 2012; GOUDAS; MAGOTSIOU, 2009). However, we found few studies aimed at determining which conditions facilitate those results in actual teaching practice and, consequently, what variables should be influenced to maximize these gains. In other words, we know very little about how PE teachers materialize CL theoretical principles in their daily practice and what they actually do when they apply this methodology in their classrooms.

Therefore, we propose a study to understand and analyze the conception of Spanish PE teachers on CL and how they implement it in their classrooms.

3 METHOD

To respond to the object of study, we proposed a multiple-case study designed to analyze and learn the ways CL is conducted in PE classes implemented by Spanish teachers, identifying commonalities and differences between theory and practice.

3.1 PARTICIPANTS

Seven Spanish PE teachers took part in the study. They were selected according to the following criteria: (1) having been identified by other teachers as references for CL in PE; (2) having taught PE classes in Primary or Secondary Schools in the last three years; (3) having published on the implementation of CL in their classes or presented studies at PE continuing education courses or

conferences; (4) having said they use CL in their classes; and (5) being willing to help with our research. The implications of this collaboration are made explicit through an agreement between the researcher and each of the teachers.

Three of the selected teachers taught in Primary Education, two in Secondary Education and two in Higher Education.

3.2 DATA COLLECTION

The main sources of data collection in this study were (a) interviews with each of the teachers; (b) non-participant observation of different classes taught by those teachers of Primary or Secondary Education during the investigation; and (c) document analysis (class schedules, teacher's publications, teacher book, student projects, etc.).

The starting point for data collection was a focused semi-structured interview (MERTON; FISKE; KENDALL, 1988) or a single issue interview (RUIZ-OLABUÉNAGA, 2012). The interview was based on a previously validated script, designed after literature on CL, and the contributions of ten international experts in that methodology, both in general and on PE, who were asked to formulate ten questions that, in their view, teachers implementing CL in their classes should be asked in order to know what they do and how they do it. A first draft of the interview was subjected to experts for evaluation, and they made suggestions about its content and structure, after which the final script was written. The next step was conducting a test interview with a PE teacher who was not included in the selected cases, but whom we knew to apply CL in his classes. The teacher confirmed that the interview seemed adequate, both in content and in structure and length. The main interview was followed by complementary ones aimed at refining, extending or supplementing the data obtained in the first interview and, in the case of primary or secondary education teachers, the observations of their classes. All interviews were fully recorded and transcribed.

A second source of information was non-participant observation of a total of 24 classes of all teachers who worked in Primary or Secondary Education during the investigation. Observations were intended to: (1) identify, in the regular class context, some of the facts presented by teachers in the interviews, corroborating data or capturing any contradictions, and (2) paying attention to other events or situations that did not come up in the interview but might be interesting to open new questions about the way teachers applied CL in their classes.

The third source of information was document analysis, focusing on teachers' class schedules, official documents of their schools, their publications on CL and, in particular, support materials used by students when working with CL in class.

3.3 DATA ANALYSIS

For data analysis, we started by defining an initial set of categories derived from the previous study of the literature on AC. Relying on "Atlas.ti.6.2" software, all interview transcripts and field notes taken during classroom observations were analyzed. Data were organized into a manageable set of records that were integrated into one of the categories set (DENZIN, LINCOLN, 2005). When that was not possible, a new, emerging category of analysis was defined.

Following the model of Huberman and Miles (1994), the next step was to reduce categories, grouping all those that had a common identifier into a single one. Thus, at the end of this process, we defined two core themes organizing all information: conception of CL and implementation of CL.

Data from the documentary analysis were integrated into the core themes defined, thus enabling triangulation of data sources, which helped strengthen the reliability of our interpretations.

3.4 INDICATORS OF RIGOR

According to Guba (1989), four criteria to ensure rigor of our research were considered: credibility, transferability, dependability and confirmability. For this, distinct strategies were considered in order to encourage the presence of those criteria in our qualitative study, including: expert consultation, verification of data and results with teachers participating in the research, collection of reference material, triangulation of people and data collection techniques, and inclusion of low-inference descriptors.

4 RESULTS

The results of the study on PE teachers' conception of CL and how they implement it in their classes are grouped into the two major core themes arising after the analysis of data, which we have already mentioned. Pseudonyms were used to maintain teachers' anonymity.

4.1 CONCEPTION OF CL

All teachers participating in the multiple-case study are aware of the work of the main CL references, both generally and in PE, although several of them express doubts when it comes to giving a precise definition of CL. Fernando acknowledges it openly, "[...] after years I still have some doubts about how to define CL, I still have questions"; Juan also expressed uncertainty when defining what CL is and what it is not:

> The definition of CL has always been a bit complicated to me, it has always been a little hard. I go to the basics of what cooperative activity is. And I always seek a positive relationship between students' tasks and compatible goals, that they are connected. (JUAN, 2011)

In any case, all teachers can perfectly distinguish CL from other concepts such as group work or cooperative play. They also agree that speaking of CL demands the presence of: (1) positive interdependence of goals, (2) working in small groups, (3) individual learning, and (4) co-responsibility in learning by each and every one of the group members. Carlos, for example, puts it as follows:

> AC would be a kind of group learning with very specific characteristics: it involves group work with simultaneous interaction and equitable participation. Furthermore, it also generates individual learning for each and every person in the group. It implies dual responsibility of each student toward his or her learning but also toward that of peers. Group work is simply to ask several people to come together and do a given task without those conditions being guaranteed. (CARLOS, 2012)

4.2 APPLICATION OF CL

All teachers in the multiple-case study demonstrate that CL is one of the methodological pillars in their class plans, although not all of them implement it as often or in the same way. For a better understanding of the results, we considered six subcategories of analysis: goals, contents, didactic resources, techniques, groups and evaluation, which we develop below.

4.3 GOALS

There is consensus among teachers when considering that motor practice is ideal for the development of social skills and values. Consequently, PE classes should become contexts that contribute to it. In this sense, all teachers agree that CL is one of the methodological strategies that promote affective and social achievement, while students achieve proper levels of motor learning. Juan, for example, states that:

> When I work with another methodology I might
> not get other things that I consider with this one.
> For me, PE's overall goals, its central aspects
> including experiencing positive motor feelings,
> appreciation of help from peers and that you help
> others achieve better social skills and emotional
> skills, appreciation of exercise as something
> important in life, for leisure time. (JUAN, 2011)

4.4 CONTENTS

The analysis of teachers' class plans shows that working with CL develops a wide variety of motor contents. Contents worked by teachers with that methodology include some with an already cooperative structure, such as acrobatic gymnastics, but also others of individual character, such as some juggling proposals. Teachers even use CL to work with contents of a strong competitive nature, such as team sports. Antonio, for example, notes that he introduces CL in didactic units of: "[...] fitness, motor skills, basic motor skills, bicycle, gymnastic skills and acrobatic sports, body expression and sports". For content with competitive structure, teachers tend to combine their CL work with other models of sports education, mainly the comprehensive model.

4.5 DIDACTIC RESOURCES

Teaching resources teachers use when applying CL with their students were oriented to providing those students with autonomous management of the learning process in different groups. Further specifying it, the resources that teachers give their students have two types of purposes: (1) to facilitate the evaluation process among students and (2) to describe the learning tasks to be developed in groups. Carlos puts it clearly by saying that he thinks that teaching materials "[...] make it easier for CL groups to work autonomously. That's the main goal as well as allowing evaluation of student's learning". Thus, the materials most frequently introduced in class are self-evaluation and peer evaluation tools, as well as activity

sheets that sometimes pose problems to be solved by students and at other times, besides describing the task to be performed, include the keys to their learning in the form of short phrases or pictures. These materials are part of the daily life of PE sessions developed with CL, as evidenced, for example, by the fact that during a class taught by Andrés, we observed how the teacher complained: "[...] only one group has showed me the evaluation sheet" and that while "[...] some [students] keep doing actions with the material, they have gone for their evaluation sheets and come back to the teacher to show them".

4.6 TECHNIQUES

Teachers participating in the study are fully aware of the main CL techniques and especially those most often applied in PE. However, this knowledge does not translate as implementation of those techniques in their classes, at least not in all cases. Thus, some teachers tend not to apply the techniques as they are described in the literature; they rather start from their general principles, but modify them according to their needs during sessions. This is the case, for example, of Víctor, who says:

> I know some (techniques) but that reading I've been doing of several proposals, eventually I always do it not to apply them literally but to change them to see how I adapt them to my methodological proposal so that it has a meaning, that is, I don't incorporate something just because it looks good in itself, but because I think it's going to contribute something to the proposal that I have already formed. (CARLOS, 2012)

Fernando says that his "[...] approach is more comprehensive, towards establishing co-responsibility in the group's learning process and meeting all CL parameters". Other teachers such as Antonio explain that they choose one technique or another depending on "[...] the type of content or task". In any case, some techniques are more common in classes than others. "Think-

share-act" (GRINESKI, 1996, p. 30) is one of the most often used techniques. Juan, for example, says that he works "[...] much by challenges or goals [...]. Any cooperative goal in which students have to share action hypothesis, speak and listen, and work together". Carlos says that the ones he uses more often are primarily "learning groups and think-share-act. But also reciprocal teaching, I do-we do, shared discovery, three lives, Aronso' puzzle [...]".

4.7 GROUPS

All teachers participating in the study agree to work through CL with small groups of two to eight people. However, there is no unanimity among them in how to form such groups. We found teachers who prefer to be the ones who form learning teams in order to ensure their heterogeneity, as Laura says: "[...] to avoid forming ghettos, but also because diversity is enriching and because life itself is very heterogeneous in every way". Others, like Juan, leave their students free to form groups "[...] according to the premises I give them. I have hardly ever needed to change groups or force them to mix, except for the typical problems of beginning a teaching unit or year". In any case, it all points to the idea that teachers do not follow strict criteria, so it is quite common to alternate different processes to form groups. For example, Antonio lets his students choose partners when "[...] working in pairs, provided they are mixed", but he would rather form the groups himself when it comes to larger groups or "[...] when the work with the cooperative model will last several days and groups will be maintained", since "[...] you cannot risk that groups are not well configured".

4.8 EVALUATION

All participating teachers emphasized the importance of evaluation in the CL process and underscored that a key element for the effectiveness of that methodology is that teachers and students can check what has been the result of the whole learning process. Teachers are also unanimous when considering that not

only students' motor achievements should be evaluated, but also the social aspects and the process of peer learning through which they have been achieved. This includes assessment of cognitive, attitudinal and emotional factors that influence decision-making processes in the distinct groups. Fernando explains, referring to a volleyball teaching unit:

> At the end, each student has to evaluate: What progress have I experienced in my ability to make decisions?; Which processes have I experienced in my technical skills, pass, set, serve and attack? And we put it just like that, in terms of evolution or progress; and the keys are in progress. (FERNANDO, 2011)

Based on these premises, teachers introduce multiple and varied evaluation procedures. Carlos says: "[...] evaluation seems important to me, and therefore I attempt to get information through several channels, hence my use of many different and varied tools to triangulate data". The most common tools include some unstructured ones, such as assemblies or individual tutoring; and structured ones such as checklists or different self-evaluation sheets and co-evaluation.

Evaluation of the social component of learning is especially important for teachers implementing CL in their classes. Thus, some of them, such as Laura, ask for "[...] a diary of conflicts so that those conflicts emerge, as well as how to solve them. If they were resolved, if not, if they had to come to me [...]". Antonio uses the "anecdote log" where he makes "positive or negative notes [...] on issues related to help or collaboration within the group". Teachers applying CL in their classes chose formative evaluation shared between teachers and students, focused, as Carlos says, "[...] not only on results but also on the process that takes place in groups". The teacher contrasts his appreciations with those of his students and establishes dialogued consensus-based processes oriented towards learning. Víctor, for example, explains it as follows:

> I can have records of individual behavior or the working group, which should be consistent with

the self-evaluation made by that group. If what
they say is different from what I observe, the
next day I use Cooperative Learning in Physical
Education to make a comment at the beginning
of group work. I approach that group and make
that evaluation process where we see if they are
really helping each other, whether it is producing
positive interdependence... It is precisely in those
processes of obtaining everyday information that
you will see if their work is really establishing
links among them, if they are contributing or
if they are not working cooperatively for the
common goal. (VÍCTOR, 2011)

5 DISCUSSION AND CONCLUSIONS

All teachers participating in the multiple-case study know the
general principles of CL. Therefore, they identified the following
characteristics of the methodology: positive interdependence
of goals, group work, individual learning, and learning co-
responsibility among all group members. All this would agree with
the definitions given in literature by the main CL references, both
generally (JOHNSON; JOHNSON, 1999, 2009; KAGAN, 2000;
PUJOLÀS, 2008; SLAVIN, 1999) and in the PE field (DYSON;
CASEY, 2012; METZLER, 2011; VELÁZQUEZ, 2010).

Teachers who introduced CL in their PE classes view it
as an important methodological strategy that, in addition to
motor learning, allows students to achieve social and affective-
motivational goals. Different studies within the motor field reinforce
this idea (BÄHR, 2010; BÄHR; WIBOWO, 2012; DYSON, 2001)
and point to CL as an inclusive strategy in PE classes (DOWLER,
2012; GRENIER; YEATON, 2012; VELÁZQUEZ, 2012a).

Any content can be taught with CL (JOHNSON, JOHNSON,
1999, PUTNAM, 1997). This idea is expressed in the motor field,
so that a simple analysis of the literature shows us the possibility of
working with a wide variety of motor contents through CL – from
gymnastic skills (ANDRÉ et al. 2011; BÄHR, 2010; BARBA,

2010) to individual (CASEY, 2010) and collective (DYSON, 2001) sports. Teachers understand that the way to structure the learning process is independent of the structure of the task to be taught. Thus, they apply CL in their classes not only to promote learning of individual or cooperatives tasks, but also to work with competitive contents.

CL implies a learning context based on peer interaction, with which students may be unfamiliar. In order to facilitate student's process of self-managing their group work, teachers participating in the study use different didactic resources. Sometimes these resources describe the tasks that will be developed in the groups, highlighting their learning keys (CASEY, 2010; VELÁZQUEZ, 2010); other times they are aimed at facilitating students' co-evaluation process (FERNÁNDEZ-RÍO, 2011; VELÁZQUEZ, 2012b).

Although it is possible to find detailed descriptions in literature of how to apply different CL structured techniques in PE (GRINESKI, 1996; VELÁZQUEZ, 2004), most PE teachers do not use those techniques in their classes. On the contrary, they tend to introduce group work where teachers tend to reinforce different prosocial behaviors they want to see expressed during the tasks. Other times, teachers start from a specific technique but they modify its structure to adjust to their students' specific needs.

Virtually all CL references are committed to maximum heterogeneity in groups (COHEN, 1999; JOHNSON; JOHNSON; HOLUBEC, 1999; PUJOLÀS, 2008; SLAVIN, 1999) – something that is also accepted by the teachers studied. However, we found differences between the most recommended formulas in theoretical terms to form groups and in how teachers form groups in their classes. Thus, while the literature suggests that it is the teacher who totally or partially controls the process of creating learning teams (COHEN, 1999; JOHNSON; JOHNSON, 1999; METZLER, 2011), teachers seem to seek some sort of balance between their students' desires to group by affinity and teachers' interest to provide

students with the opportunity to work with colleagues they would not choose at first. Thus, the most common way to group students is to allow them to choose their teammates, provided they meet some conditions imposed by the teacher to ensure heterogeneity for the groups formed.

All participating teachers value the importance of evaluation in the CL process. Some even point out that a key element of the effectiveness of this methodology is that teachers and students can check what the result of the whole learning process has been. They also unanimously consider that not only students' motor and social achievements must be evaluated, but also the peer learning process through which they have been achieved. This includes evaluation of cognitive, attitudinal and affective factors influencing decision-making in the different groups. From these premises, teachers introduce different assessment procedures, some of which are unstructured, as reflections at the end of sessions; others are structured, such as observation recorded through students' control sheets or self-evaluation and co-evaluation sheets. The analysis of the literature shows that evaluation associated to CL is characterized by: (1) being integrated into the very process of group learning (CASEY, 2010; JOHNSON; JOHNSON, 1999; JOHNSON; JOHNSON; HOLUBEC, 1999; VELÁZQUEZ, 2010); (2) including self-evaluation and peer evaluation processes (FERNÁNDEZ-RÍO, 2011; FRAILE, 2012; LÓPEZ PASTOR et al., 2010); (3) using multiple and varied tools (JOHNSON; JOHNSON, 1999; LÓPEZ-PASTOR et al., 2010; PUJOLÀS, 2008; VELÁZQUEZ, 2012b); and (4) aiming to evaluate motor, social and attitudinal cooperative achievements (JOHNSON; JOHNSON, 2004; LÓPEZ-PASTOR et al., 2010; VELÁZQUEZ, 2012b). These features of evaluation, as reflected in the literature, are consistent with those found in the study of teachers applying CL in their PE classes.

In this paper we analyzed the conception of CL of a group of Spanish Physical Education teachers who are recognized as references for this methodology, as well as the most important

features of their way to implement it in the classroom. We believe that the results can be useful to PE teachers interested in developing CL processes with their students and researchers specializing in this area.

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