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## Sport education as a cooperative learning endeavour

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## **Sport Education as a Cooperative Learning Endeavour**

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## **Abstract**

*Background:* A number of studies have contemplated aspects of cooperative learning that might emerge from a unit of sport education (Dyson, Griffin and Hastie 2004; Dyson, Linehan, and Hastie 2010). None to date, however, has looked empirically at the influence sport education may have on individual team member accountability and other critical elements of cooperative learning.

*Purpose:* The aim of this study was to present evidence that cooperative learning (or at least its critical elements) is a potential side effect of using sport education.

*Participants and settings:* A total of 90 students (47 boys, 43 girls,  $12.42 \pm .56$  years), enrolled in the same high school in Spain agreed to participate in the study. The school administration randomly distributed the students among four different year eight classes, and the research team randomly allocated two classes to the experimental group ( $n = 48$ ), and two ( $n = 42$ ) to the control (comparison) group. The experiment was conducted in a non-manipulated (i.e. intact) educational context. Prior to the mid-term break, both study groups experienced the same Football learning unit conducted using sport education. After the break, both groups experienced a Basketball learning unit. However, the teacher continued to use sport education with the experimental group (group A) and adopted a traditional instructional approach with the comparison group (group B). Therefore, students in group A experienced 24 consecutive sport education lessons, while those in group B experienced 12 sport education lessons followed by 12 traditional lessons.

*Research design:* The study followed a pre-test, post-test, quasi-experimental, comparison group design.

*Data collection:* All participants completed a previously designed and validated cooperative learning questionnaire.

*Data analysis:* The statistical package SPSS (version 22.0) was used. Descriptive and inferential analyses were conducted.

*Findings:* Results showed that group A enhanced their perceptions of Interpersonal Skills, Group Processing, Positive Interdependence, Promotive Interaction, Individual Accountability, and Global Cooperation significantly more than group B.

*Conclusions:* Cooperative learning (or at least its critical elements including global cooperation) is a side effect of using sport education. As Casey and Quennerstedt (2020) argued, cooperation is not learnt but is practiced over successive lessons and units. Given the real-world importance of cooperative learning and given calls to broaden the pedagogical experiences of young people (Metzler 2011), it seems important to have different approaches to help young people become more cooperative.

**Keywords:** Models-based Practice; Secondary Education; Pedagogical Models;

The small group learning that is central to Sport Education requires that team members cooperate on a number of tasks; thus, the model is consistent with various forms of cooperative learning. And as in successful cooperative learning models, although team performance is an important outcome, each individual team member is held accountable for her or his contributions.

Siedentop, Hastie and van der Mars (2011, 18)

Cooperation is internationally recognised as a key component and expected outcome of physical education in national school curricula and national standards (see for example: Department for Education 2013; MECD 2013; SHAPE America 2020). It is important, therefore, that we better understand the capacity of different pedagogical approaches to achieve such cooperative goals. Despite Siedentop et al.'s (2011) assertion, and sport education's rich history of research and practice (Hastie and Wallhead 2016), the model's apparent capacity to mimic the student learning gains attributed to cooperative learning has yet to be explored. A number of studies considered the cooperative 'effects' that might emerge from a unit of sport education (Dyson, Griffin, and Hastie 2004; Dyson, Linehan, and Hastie 2010; Hastie and Sharpe 1999; Kim et al. 2006; Pope and Grant 1996; Siedentop et al. 2011). None to date, however, has looked empirically at the impact sport education has on individual team member accountability and other critical elements of cooperative learning. The aim of this paper, therefore, is to present evidence that cooperative learning (or at least the critical elements [Casey and Kirk, in press]) is a potential and desirable side effect of using sport education.

The physical education and sport pedagogy community is increasingly being encouraged to adopt student-centred approaches. Both Oliver and Kirk (2016), in their work on an activist approach to research and advocacy for girls and physical education,

and Hastie and Mesquita (2016), in their work on sports-based physical education, serve as recent examples of the promotion of such approaches. By centring our focus on the student (Oliver and Kirk 2016) it is widely believed that the physical education and sport pedagogy community is better able to challenge what Pope and O’Sullivan (2003) saw as the privileging of aggression and competitiveness at the expense of cooperation. There are a number of ways in which we might increase the cooperative interactions between students as we strive for pedagogies more centred on their needs. In this paper, we have chosen to explore the notion that sport education is one of the approaches we might use to increase positive and promotive student interactions. Before we do that, it is important to provide a description of the five critical elements of cooperative learning.

Casey and Quennerstedt (2020) traced the development of cooperative learning in physical education since its first use in the 1980s. One of the findings was that “Johnson and Johnson – through their five elements – are the key theorists underpinning cooperative learning in physical education” (Casey and Quennerstedt 2020, 10). These elements (Table 1) are used in the remainder of the paper to align the cooperative learning side effects with sport education. For a fuller understanding of cooperative learning, we refer the reader to Dyson and Casey (2016).

<Insert Table 1 about here>

### **Sport education as a cooperative endeavour**

Dyson et al. (2004) observed five areas of overlap between sport education and cooperative learning: (1) students do not take part in the class as isolated beings, instead they are considered part of a “holistic learning enterprise”; (2) the proposed activities favour the inclusion of social, physical and cognitive learning outcomes; (3) students work in small groups and need each other to complete the task properly; (4) individual accountability is present in the different learning activities; and (5) cooperative learning

structures can help students learn to cooperate in tasks and game play and, consequently, compete more effectively by working as a team.

Sport education is one of the most widely researched pedagogical models. However, much of the research has focused on students' interpersonal interactions, including social development and inclusive participation (Hastie and Wallhead 2016) but not cooperation. Such a focus may be a consequence of concerns that the model favours unequal participation as a result of the emphasis on competition (Curnow and Macdonald 1995). The focus of this fear (i.e. unequal participation) resides in skill level and gender, because those students with higher status dominated social interactions, with boys tending to occupy those positions (Ennis 2000). As a result, new studies began to focus on the analysis and promotion of positive interpersonal relationships. Researchers introduced elements which encouraged positive student interdependence (Hastie and Sharpe 1999) through, in some cases, a close association with other pedagogical models (Ennis 2000; Hastie and Buchanan 2000) such as cooperative learning (Dyson et al. 2004).

In their work exploring the use of cooperative learning, Polvi and Telama (2000) used experimental and control groups to explore the capacity of the model to act as a social enhancer. They systematically re-paired students in the experimental group every three weeks while providing no information or guidance to the control group. They found that students in the experimental group were more willing and motivated to help and support their peers. They also found, from results with the control group, that working with the same person for extended periods of time did not promote social development as they expected. What is interesting, for the purposes of this study, is the positive impact on social enhancement brought about by the close proximity of small groups of students in their teams without the limitations imposed by rigid pairings, something that the use of persistent teams in sport education replicates.

These results complement those reported by Lafont, Proeres, and Vallet (2007) when they examined verbal exchanges and their effect on both interpersonal relationships and basketball shooting and skill level. Working over a period of ten physical education lessons and using a basketball-like game with adapted rules as their sport, Lafont et al. (2007) found that cooperative situations had a positive effect on motor skills. They also found that verbal discussions among peers in the experimental group (i.e. those who experienced cooperative learning) had a positive impact on motor and tactical skills, on off-the-ball and on-the-ball skills and on shooting rate. As a consequence of using cooperative learning, Lafont et al. (2007) concluded that verbal exchanges between peers allowed teams to make better tactical choices. The authors recommended using heterogeneous teams and peer discussions as a way of increasing the impact of verbal exchanges on team play.

### **The five elements of cooperative learning in sport education**

Drawing on their extensive work in sport education, Siedentop et al. (2011) set out some of the different ways in which the model might encourage cooperation among participants. For example, they suggested that "early scrimmages and practice games should focus on keeping the ball in play through cooperative scoring, where the two teams try to keep the ball going over the net as many times as possible" (p. 32). This argument is supported by Kim et al. (2006), who held that *interpersonal and small group skills* are one of the elements of cooperative learning to be promoted when conducting sport education intervention programs. Similarly, Hastie and Sharpe (1999) found that a sport education season served to improve the interpersonal skills of students at risk.

The capacity to develop such skills is exemplified by the work undertaken by Siedentop (1998) who believed that the use of permanent small groups allowed students to take advantage of the social development opportunities that come from membership of



those groups. The early work in New Zealand by Pope and Grant (1996, 111) states that, “being involved in a small group over an extended period of time served as a catalyst to encourage team members to take on responsibility” and so enhances their social development. Further evidence of a possible connection between cooperative learning elements and sport education can be found in the seminal work of Siedentop (1994) and the longitudinal study of Dyson et al. (2010), where students’ roles were signalled as a key element in promoting positive interdependence or individual accountability. For his part, Hastie (1996) found that the accountability system built into sport education helped pupils adhere to their roles and duties and promoted individual accountability. Similarly, Dyson et al. (2010) reported that students enjoyed taking on the teacher’s responsibilities when they performed some of the roles included in a sport education intervention program.

One of the earliest empirical examples of research into sport education was undertaken in New Zealand (Grant 1992). This study, which reported on the implementation of the model by a group of teachers, described increases in the levels of interaction and cooperation between students (Grant 1992). Such increases may be attributable to the use of enduring teams throughout the unit of sport education. Indeed, Siedentop et al. (2011) noted that students are required to work inside their teams, which, in turn, helps in creating positive bonds and affiliation. This is not always the case however, and an individual student’s status has been shown to have an influence on whose opinions count and whose voices are heard, with low status students feeling silenced (Brock, Rovegno, and Oliver 2009). Given the importance of both *individual accountability* and *positive interdependence* in cooperative learning (see below), such outcomes in a sport education unit might mitigate against such silencing. In her consideration of sport education as a means of weakening existing power hierarchies in

physical education, Brunton (2010) recommended that teachers should help students learn to perform different roles efficiently and encourage team support. Such adaptations, it could be argued, would be aided by the development of students' *individual accountability* and *positive interdependence* respectively.

The longevity of teams and seasons, coupled with facets of *group processing* (Lafont et al. 2007; Polvi and Telama 2000), support Siedentop's (1995) argument that in enduring teams, students have to deal with differences and put up with the consequences of their agreements. Therefore, students must learn to discuss and reach agreements. The long-term team affiliation inherent in sport education, coupled with opportunities to engage in reflective discussion, do much to align the model with the types of outcomes associated with cooperative learning. In an ecological analysis of Sport Education, Hastie (2000) found students playing in a team and positively interacting with other students. In a similar vein, Pope and Grant (1996) found that long-lasting learning units built multiple connections among group members. Such student-student connectivity hints at the desirability of *positive interdependence* in sport education.

Other aspects, what Author (forthcoming) refer to as learning aspiration, signal the connections that exist between both pedagogical models. Team affiliation and inclusion, which are important in any cooperative learning framework, are two of the most prominent features of sport education (Wallhead and O'Sullivan 2005). Kinchin et al. (2004) and Ka and Cruz (2008) independently determined that levels of team inclusion increased, and students recognised the team as a key factor in improving their performance after experiencing sport education. Comparably, MacPhail et al. (2008) and Sinelnikov and Hastie (2008) found that students' perceptions of fun and success changed from an individualistic to a group perspective after one sport education season. In their review of the sport education literature, Wallhead and O'Sullivan (2005) explained that

students, after a long period working in the same group, become enthusiastic about achieving their group's goals, and, consequently, learn to cooperate. Over the last decade, research has continually, and independently, accentuated the need to bolster the cooperative aspects of sport education (Farias, Hastie, and Mesquita 2015). Brock et al. (2009) believed that there is a need to study ways to create environments in which students can learn through equitable interaction and participation.

Based on the aforementioned, the aim of this paper is to present evidence that cooperative learning (or at least its critical elements) is a potential and desirable side effect of using sport education.

## **Materials and method**

### **Participants**

A total of 90 students (47 boys, 43 girls,  $12.42 \pm .56$  years), from the same high school in Spain, agreed to participate. The school administration randomly distributed the students among four different year eight classes, and the research team randomly allocated two classes to the experimental group (group A) ( $n = 48$ ), and two classes ( $n = 42$ ) to the control (comparison) group (group B). The goal was to conduct the experiment in a non-manipulated (intact) educational context. Convenience sampling was used. Researchers had access to the school and the classes (Cohen, Manion and Morrison 2011). Both groups experienced sport education prior to the mid-term break, but in the following learning unit the group A continued with sport education, while group B shifted to a traditional instructional approach.

### **Design and procedure**

The study followed a pre-test, post-test, quasi-experimental, comparison group design. The intervention program (sport education vs traditional approach) was the

independent variable, while the dependent variables were the students' perceptions of the five elements of cooperative learning (See table 1) and a global cooperation factor. These perceptions were assessed using a validated questionnaire introduced later in the data collection section.

Initially, permission from the first author's university ethics committee was obtained. Second, the whole project was explained to the participating school's administration, physical education teachers and students' parents, and informed written consent was obtained from all of them prior to the beginning of data collection. The study respected the ethical values required in research conducted with human beings: informed consent, right to information, protection of personal data, guarantees of confidentiality, non-discrimination, gratuity and possibility to leave the study in any of its phases (McMillan and Schumacher 2001). The research protocol was approved by the first author's University Review Board for Human Subjects Research.

Prior to the mid-term break, both study groups experienced the same Football learning unit conducted using sport education (12 sessions). After the break pre-tests were conducted, and both groups experienced a Basketball learning unit (12 sessions). However, while the teacher continued to use sport education with group A, he adopted a traditional, teacher-led instructional approach with group B. Therefore, students in the group A experienced 24 consecutive sport education lessons, while those in group B experienced 12 sport education lessons followed by 12 traditional ones. At the end of both units, post-tests were conducted. Data were not collected prior to the beginning of the first learning unit (Football) because the research aim, to assess sport education as a cooperative learning endeavour, pivoted on the implementation of the second learning unit (Basketball). Additionally, we wanted to avoid participants' becoming tired through repeated questionnaire administration over a short period of time (Díaz 2007). Therefore,

data were collected immediately prior to the beginning of the second unit (pre-test), and at its end (post-test).

### **Data collection**

The *Cooperative Learning Questionnaire* (Fernandez-Rio, Cecchini, Mendez-Gimenez, Mendez-Alonso, and Prieto 2017) was used to assess the effects of both intervention programs. This is an internationally validated questionnaire to assess cooperative learning in school children ages 11 to 18 (Fernandez-Rio, Cecchini, Morgan, Mendez-Gimenez, and Lloyd 2020). It includes 20 items grouped (five items each) to represent the five basic elements of cooperative learning (Johnson and Johnson 1991). Each one is introduced with an item to show the connection between each basic element and the questionnaire and Cronbach's alphas, obtained at pre and post-test in the present study, are also included to show its reliability: interpersonal skills: "We work on discussing, debating, and listening to others", .759 and .770, group processing: "Groupmates debate ideas and opinions", .727 and .712, promotive interaction: "Groupmates relate with each other and interact during the tasks", .683 and .764, positive interdependence: "My groupmates' help is very important to complete the tasks", .787 and .798, and individual accountability: "Every group member has to participate in the group's tasks", .698 and .757. All items were preceded by the stem: "In your Physical Education class....". Participants answered in a 5-point Likert scale from 1: "totally disagree" to 5: "totally agree". The same instrument was validated to produce a global cooperation factor when all the items are grouped in a single variable. Cronbach's alphas obtained were .896 at pre and .921 at post-test. They all could be considered acceptable, and they showed the questionnaire's high internal consistency (Vincent 2005).

### **Intervention programs**

Hastie and Casey (2014, 423) highlighted that to establish the fidelity of a model's implementation it is necessary to provide: "a) a rich description of the curricular elements of the unit, b) a detailed validation of model implementation, and c) a detailed description of the program context". All of these conditions have been met in this project.

***Sport education.*** The basic design of all the units conducted using this pedagogical model (Football in both study groups, and Basketball only in group A) followed the model's critical elements (Siedentop et al. 2011): (a) *Season*: each learning unit (Football and Basketball) was organized during a 12-session season; (b) *Formal competition*: within each season, there were two formal competitions: the first one based on individual skills: dribbling, passing and shooting (lessons 2-6), and the second one based on modified team games (lessons 7-11); (c) *Affiliation*: students were grouped in teams of 5-6 members for the whole unit; each team had to design a shirt, a flag, a cheer, a mascot, and self-made medals for the culminating event; (d) *Record keeping*: points were awarded in each competition (two points for the win, one and a half for the tie, one for the loss), but also daily for bringing the team's apparel, for fair play, for performing the roles correctly...; (e) *Culminating event*: in the last lesson (12), a final tournament was organized, and all teams exchanged their self-made medals; and (f) *Festivity*: all the previously mentioned elements helped create a festive atmosphere. Additionally, all students performed different roles during the unit: Player, coach, conditioning coach, captain, referee, and equipment manager. We followed Siedentop et al.'s (2011, 31) idea that "technique development practice should be as game-like as possible" in order to develop games sense: "a combination of learning appropriate techniques, applying tactics and understanding rules" (28). Basic technical (i.e., dribbling, shooting, passing) and tactical skills (i.e., intercepting, balance, positioning, fakes, fast-break) were integrated to provide challenging tasks. Cooperative learning was used to "reduce" the competitive

atmosphere and promote a class mastery climate. Its five critical elements were embedded in the lessons: (a) interpersonal skills: groups were awarded points for positive attitudes within the group (i.e., encouraging and helping each other) and between groups (i.e., sharing equipment and fair play); (b) group processing: strategies used included cooperative scoring where students had to solve a challenge as a group (i.e., make as many shots to the basket as possible in 30 seconds); (3) promotive interaction: students worked throughout the whole unit in small, heterogeneous groups, this encouraged them to support each other to achieve the best result (i.e., each group member had to participate in the individual skill competition, so they helped each other get ready to perform at their best); (4) positive interdependence: each student performed one role daily, which was essential for the group's normal functioning (i.e., the equipment manager was in charge of providing the needed equipment); and (5) individual accountability: students had the possibility to earn points for their teams (i.e., bringing the teams' apparel and performing their role).

***Traditional instructional approach.*** The design of the unit conducted using this methodology (Basketball only in group B) followed a traditional framework. Lessons 1-4: teaching and learning of basic technical skills (i.e., dribbling, shooting, passing) through the use of drills. Lessons 5-8: the teacher moved to teach basic offensive-defensive skills (i.e., intercepting, balance, positioning, fakes, fast-break) and, during the last lessons of the unit (9-12), adult-size games and a final assessment performing isolated skills were used. Content selection, management, task presentation and structure, instructional interaction, pacing, and evaluation were controlled by the teacher (Metzler 2011). Groups were selected by the teacher and changed from session to session. Each session was divided into three parts: warm up, main part and ending. The first few sessions focused on basic technical elements, but they also included games to make it

more appealing for the students, while the last sessions focused on basic offensive-defensive skills and games (Table 2).

<Insert Table 2 about here>

In order to validate the instructional approach implemented, all sessions were videotaped. Ten were randomly selected and sent to two independent researchers who were experts on instructional designs. They were asked to verify both intervention programs. A checklist with benchmarks, adapted from Hastie et al. (2013), was designed to assess the basic elements of both sport education and the traditional approach (Figure 1). Both observers scored 30 points on each instructional approach (100% fidelity) and reached 100% inter-observer agreement. In presenting this percentage, we do not argue that sport education was used in its textbook form. Instead, we hold that all critical elements of the model were present in the locally adapted approach used with these children in this school.

<Insert Figure 1 about here>

The same physical education teacher, with more than 10 years of teaching experience, taught both study groups (all four classes). Prior to this study, the teacher had always followed a traditional instructional approach in his classes. Given that he was new to sport education, a 40-hour training program (15 hours theory, 25 hours practice) on this pedagogical model was designed. Different schemes (i.e., seminars, pre-designed sessions, video analysis and feedback cycles) were used to provide training and support to the teacher prior to and during the implementation program (Braithwaite, Spray, and Warburton 2011). The programme included games, tasks and pre-designed sessions to practice, to analyse and to develop the final version of the learning units implemented. One member of the research team (a Sport Pedagogy expert with more than 10 years of



theory and practice on pedagogical models) conducted the training program and carefully supervised all learning units.

### **Data analysis**

All data were analysed using SPSS 24.0 (IBM, Chicago, IL). A one-way analysis of variance (ANOVA), selecting Levene's test ( $p > .05$ ), was used to assess initial homogeneity between the two study groups at pre-test (Martin and Bridgmon 2012). Pre and post-tests descriptive statistics were also calculated. A repeated measures ANOVA was conducted to assess intragroup pre-post-test differences. Finally, covariance analyses with the post-test scores (post-test MANCOVA and ANCOVAs) with the pre-test as covariate were conducted, which allowed verification of the impact of the program. Effect size (Cohen's  $d$ ) was also assessed (small  $< .5$ ; moderate  $.50-.79$ ; large  $\geq .80$ ) (Vachon-Haase and Thompson 2004).

### **Results**

Results from the pre-test ANOVA showed no statistically significant differences between group A and group B before the intervention program: Wilks' Lambda = .908,  $F(5, 63) = 1.274$ ,  $p < .286$ ,  $\eta^2 = .092$ . Univariate ANOVAs also indicated no statistically significant differences between the groups in any of the variables assessed. Therefore, both groups could be considered homogenous at the beginning of data collection.

The repeated measures MANOVA showed that there were pre-test post-test significant differences among groups: Wilks' Lambda = .436,  $F(9, 58) = 8.328$ ,  $p < .001$ . Subsequent univariate ANOVAs showed statistically significant differences favouring the EG in interpersonal skills:  $F(1, 67) = 36.863$ ,  $p < .001$ ,  $\eta^2 = .358$ , group processing:  $F(1, 67) = 24.794$ ,  $p < .001$ ,  $\eta^2 = .278$ , positive interdependence:  $F(1, 67) = 40.501$ ,  $p < .001$ ,  $\eta^2 = .382$ , promotive interaction:  $F(1, 67) = 16.076$ ,  $p < .001$ ,  $\eta^2 = .193$ , individual

accountability:  $F(1, 67) = 42.423, p < .001, \eta^2 = .386$ , and global cooperation:  $F(1, 67) = 57.806, p < .001, \eta^2 = .461$ . Effect sizes were small.

Finally, results of the MANCOVA conducted with the post-test scores showed statistically significant differences between those participants who experienced the experimental and the control conditions at the end of the intervention program, showing that the EG reached higher scores (Table 3): Wilks' Lambda = .263,  $F(5, 57) = 31.943, p < .000, \eta^2 = .737$ . Subsequent univariate ANCOVAs showed significant differences in all the variables assessed favouring the EG: interpersonal skills:  $F(1, 10.55) = 47.721, p < .000, \eta^2 = .439$ , group processing:  $F(1, 7.9) = 59.473, p < .000, \eta^2 = .494$ , positive interdependence:  $F(1, 10.14) = 81.427, p < .000, \eta^2 = .572$ , promotive interaction:  $F(1, 6.78) = 41.584, p < .000, \eta^2 = .439$ , individual accountability:  $F(1, 9.47) = 91.631, p < .000, \eta^2 = .600$ , and global cooperation:  $F(1, 8.91) = 139.452, p < .000, \eta^2 = .696$ . Effect sizes ranged from small to moderate.

<Insert Table 3 about here>

## Discussion

The aim of this study was to present evidence that the critical elements of cooperative learning are a potential, and we would argue desirable, side effect of using sport education. Results showed that students in group A evaluated their interpersonal skills, group processing, positive interdependence, promotive interaction, individual accountability, and global cooperation significantly higher than group B. Moreover, group A was the only group that showed an increase in these variables along the study.

Regarding the study's aim, results showed that sport education can have a positive impact on students' development of the five critical elements of cooperative learning. All elements were shown to significantly increase from the beginning to the end of the

intervention programs in group A. Moreover, the final scores were also significantly higher. Both results indicate that students in group A improved their perceptions of the critical elements of cooperative learning and reached higher levels at the end of the intervention program. Previous research has considered the secondary effects of cooperative learning that might emerge from sport education (Dyson et al. 2004; Dyson et al. 2010; Hastie and Sharpe 1999; Kim et al. 2006; Pope and Grant 1996; Siedentop et al. 2011), but this is the first investigation that has empirically demonstrated this to be the case. Given this finding, sport education could be considered to be a pedagogical model capable of promoting cooperation among students. Whilst further research is needed to better understand the elements that cooperative learning and sport education share, there is a case for promoting sport education's propensity to create positive classroom climates.

Beginning with promotive (face-to-face) interaction, results from the present study showed that it reached significantly higher scores from pre to post-test in group A, and the students' final perception was also significantly higher in this group. Grant (1992) described increases in the levels of interaction and cooperation between students when experiencing sport education. The fact that students are grouped in teams that remain stable during the complete learning unit (season), where they are required to work together, can help expand the interactions among them, and could explain the development of positive bonds between group members (Siedentop et al. 2011). This is important from a socio-constructivist point of view, as opportunities for interactions within a group are seen to be essential in the construct of meaning, and consequently, learning (Rovegno and Dolly 2006; Lafont et al. 2007). Results from the present study showed that the sport education framework can promote students' promotive interaction and, consequently, cooperative learning skills that have been shown to help them learn.

Educators should therefore be aware of these positive connections when planning to implement similar programs.

The second critical element of cooperative learning is positive interdependence. Results showed that it had increased significantly in group A and reached higher levels. Hastie (2000) found that students in a sport education team positively interacted with other students. Moreover, Pope and Grant (1996) observed perceptible changes in group dynamics and described this as a positive connection created between students as a result of the framework that sport education provides. One reason for this could be the presence of specific student roles, since they have been signalled as promoters of positive interdependence (Dyson et al. 2010). However, previous research has also warned against possible unequal participation fostered by the competitive side of sport education (Curnow and Macdonald 1995) and unequal social interactions (Ennis 2000), which could harm students' connections. However, results from the present study showed that the positive association between students improved after experiencing the model. The call for teachers to promote team support to all members (Brunton 2010), regardless of skill level or gender, or the idea of integrating a cooperative learning spirit within sport education (Dyson et al. 2004) could have helped the experimental group's positive interdependence. The development of positive interdependence is very important if teachers want their students to feel part of their teams and experience a positive climate in which they can socialize and learn. Consequently, the importance of environments that promote and support positive interdependence should be a priority for sport education users if they wish to maximise the development of all students.

Pope and Grant (1996) claimed that being in a small group over a long period of time (one of the main features of sport education) can help students develop personal responsibility. Results from the present study supported this finding as the students that

continued experiencing sport education increased their individual accountability, reaching higher scores than those who also experienced a traditional approach. In other words, being in groups during the learning units helped students develop their individual accountability. The use of roles helps students adhere to their duties, and it has been highlighted as a significant element in promoting students' accountability (Siedentop 1994). Previous research found that students enjoy performing some of the duties (roles) traditionally conducted by the teacher (Dyson et al. 2010), and this, in turn, helped develop their individual accountability. Brunton (2010) recommended that teachers show students how to perform jobs within the class to further promote this type of responsibility. It is important to use specific roles in class. They help make visible some students who may, under more traditional circumstances and for different reasons (i.e., skill level, gender, ethnicity), play secondary roles and do not feel part of the class. This can lead to isolation and to educational, social and behavioural concerns that may, in the long term, lead to disaffection and poor student outcomes (Curran and Standage 2017).

The fourth critical element of cooperative learning is group processing. Results showed that individuals who continued experiencing sport education increased their group processing more than those who stopped, and perceived themselves to have reached higher levels. Within the enduring, small teams inherent in sport education, students have the opportunity to face difficulties, discuss their functioning and find solutions based on mutual agreement (Siedentop 1995). All these outcomes can be facilitated through group processing and the results in this study showed that, among the cooperative learning critical elements, group processing significantly increased more in group A. Enduring groups provide students with many opportunities to interact, as they may be involved in deep, constructive discussion (Polvi and Telama 2000; Lafont et al. 2007). Nevertheless, educators should be aware that group processing can be unbalanced if some students

control the meetings (Salonen, Vauras, and Efklides 2005). Consequently, teachers need to provide opportunities for everyone to participate if students are to profit from the claimed benefits.

The fifth and final critical element of cooperative learning is interpersonal and small group skills. Results from the present study showed that these skills were augmented in the students that experienced only sport education. This connection was also observed by Hastie and Sharpe (1999) in a group of students at risk. The use of permanent, small groups, where students must interact constantly and discuss, debate, help each other (Siedentop 1998) is arguably one of the key elements of sport education that fosters personal development, because it allows students to thrive in modern society. This is important in a society where individuals constantly interact. Such interactions are important, and can be made more positive, if young people have experience of developing and maintaining positive relationships with their peers (Kao 2019).

The impact of sport education on the cooperative learning elements was also observed in a novel indicator: global cooperation, which significantly increased only in group A, who perceived themselves to have obtained higher levels at the end of the program. Previous research has shown this factor to be a valid, reliable measure in different contexts (Fernandez-Rio et al. 2017, 2020). Therefore, it serves to further the positive links between sport education and cooperative learning. In turn, global cooperation constitutes a novel approach to assess cooperation in educational contexts.

The present study has some limitations. The first being that participants were not assessed prior to the start of the first learning unit (Football), which was taught using sport education. Our aim was to focus on the second learning unit implemented (Basketball) and avoid participants' fatigue through repeated questionnaire administration in a short period of time. Pre-tests showed that there were no significant differences between groups

A and B and that post-test results could only be derived from the second learning unit. The second limitation was the number of participants. Four classes in one school could be considered limited, and similar studies should be conducted involving more schools and students and across more time points. The third limitation refers to the number of data sources (just one questionnaire). Two or more data sources to obtain information from the teacher, external observers or the students through a different instrument (i.e., focus groups) would have provided a 'wider picture'. The fourth and final limitation has to do with difficulties in determining the presence of the five critical elements of cooperative learning in a sport education unit. That said, one conclusion can be drawn from the present study: sport education can have a positive impact on the five critical elements of cooperative learning and on Global Cooperation. Given the real-world importance of cooperative learning and given calls to broaden the pedagogical experiences of young people (Metzler 2011), it seems important to have different approaches to helping young people in becoming cooperative.

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