`Review article`

Review of the Status of Learning in Research on Sport Education: Future Research and Practice

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Abstract

Research concerning Sport Education's educational impact has shown unequivocal results according to students' personal and social development. Nevertheless, research is still sparse with respect to the model's impact on student learning outcomes. The goal of the present review is to therefore scrutinize what is currently known regarding students' learning during their participation in Sport Education. This research spans a variety of studies, cross various countries, school grades, the sports studied, as well as the methods applied and dimensions of student learning analyzed. While research on the impact of Sport Education on students' learning, as well as teachers' and students' perceptions about student learning has shown students' improvements during the participation in Sport Education seasons, there is still considerable variance in these results. For example, some studies report superior learning opportunities to boys and higher skill-level students while other studies have identified superior learning opportunities for girls and lower skill-level students. These inconsistent results can be explained by factors not considered in the Sport Education research, such as the effect of time on students' learning and the control of the teaching-learning process within Sport Education units. In this review directions for future research and practice are also described. Future research should define, implement, and evaluate protocols for student-coaches' preparation in order to understand the influence of this issue on students' learning as well as consider the implementation of hybrid approaches. Moreover, future studies should consider the interaction of gender and skill level and a retention test in the analysis of students' learning improvements in order to obtain a more realist and complete portrait of the impact of Sport Education. Finally, in order to reach an entirely understanding of the teaching-learning process, it is necessary to use research designs that attend to the complexity of this process.

Key words: Assessment, gender, instructional models, physical education, skill level, students.

Introduction

As a response to the lack of authenticity and meaningfulness of a techniques-centred approach to sport within physical education, Siedentop (1994) developed "Sport Education". The overriding goals of this pedagogical model are the development of competent, literate and enthusiastic sportspersons (Siedentop et al., 2011). Reviews of research on Sport Education (e.g., Hastie et al., 2011; Wallhead and O'Sullivan, 2005) have reported varying degrees of accomplishment of these goals, to the

point now where Hastie (2012, p. 10) suggests the following executive summary: "evidence for competency is 'burgeoning and developing', support for literacy is 'emerging', and that enthusiastic responses by students have been 'significantly substantiated''.

According to Wallhead and O'Sullivan (2005), research on Sport Education as a pedagogical model has been framed according to two broad categories: practical strategies required to implement Sport Education (pedagogical strategies, assessment, model application to different areas, etc.) and the educational impact of this model on various dimensions of student learning. With respect to the second of these (Sport Education's educational impact), research findings have suggested consistent results according to students' personal and social development, namely their attitudes (enthusiasm, motivation, etc.) and values (affinity, equity, etc.) (Hastie et al., 2011; Wallhead and O'Sullivan, 2005). These findings are reflected by teachers' (Alexander et al., 1996; Strickwerda-Brown and Taggart, 2001) and students' (Bennett and Hastie, 1997) perceptions as well as empirical measurement (Hastie, 1998b).

Nonetheless, research is still sparse with respect to the model's impact on student learning outcomes (Hastie et al., 2011). This issue is particularly important given that learning is one of the central goals of education, which means that the substantive value of the motor task cannot be underestimated at the expense of group activities and social interaction. The personal and social domain cannot therefore become an end in itself, and it is through the motor task, the pursuit of competence and performance that physical education becomes meaningful (Mesquita, 2012). Therefore, the purpose of the present study is to scrutinize what is currently known concerning students' learning when participating in Sport Education in order to make judgments and directions that future research and practice might follow.

Methods

Systematic search and study selection

A systematic literature search was conducted using seven databases, namely *Academic Search Complete, ERIC, SPORTDiscus with Full Text, PsychInfo, Education Research Complete, ISI Web of Knowledge* and *SCO-PUS*. This search was conducted from their inception to September 20, 2013 using the "*Sport Education*" as the keyword, and performed by two researchers with experi-

ence in this methodology and knowledgeable of instructional models in physical education.

Using these, studies for this review were included according to the following criteria: (i) were published in peer reviewed international journals; (ii) included at least one group participating in a Sport Education season; and (iii) focused on student's learning outcomes (skill development, knowledge, tactical awareness and game play). Review and opinion articles, articles focusing on personal/ social outcomes, and articles focused on the discussion of the practical strategies required to implement Sport Education (pedagogical strategies, assessment, etc.) were excluded from this review.

Figure 1 presents the summary of decisions taken for identifying studies. Initially, from the wide range of articles that identified "Sport Education" in either the title, abstract or keywords (n = 36,954), only those related to Sport Education research were selected for reading (n = 276). From this number, only peer-reviewed articles related to students' learning outcomes (skill development, knowledge improvement tactical development and game play) were selected (n = 34). Review articles (n = 2) and articles without full text (n = 9) were excluded for this review. Therefore, only peer review journal articles that specifically studied students' improvements according to skill development, tactical development or game

play were included to the present review (n = 23).

In order to analyse all the information from the 23 articles included in this review, content analysis was performed. The following categories were defined a priori using the method suggested by Harris et al. (2013): *purpose*, *type of study*, *dimension of learning analysed*, *participants/setting*, *data collect/analysis,* and *principal results*.

Assessment of study quality

The 23 studies that met the inclusion criteria were assessed for quality. These criteria were adapted from the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations (Vandenbrouck et al., 2007) and the Consolidated Standards of Reporting Trials (CONSORT) statement (Moher et al., 2001). A formal quality score for each study was completed on a six-point scale by assessing a value of 0 (no present or inadequately described) or 1 (present and explicitly described) to each of the following questions: (a) Did the article provide a detailed description of the program context: teacher expertise and students previous experience? (b) Did the study report sources and details of outcome assessment? (c) Did outcome assessment instruments have acceptable reliability for the specific age group? (d) Did the study report the precise details of
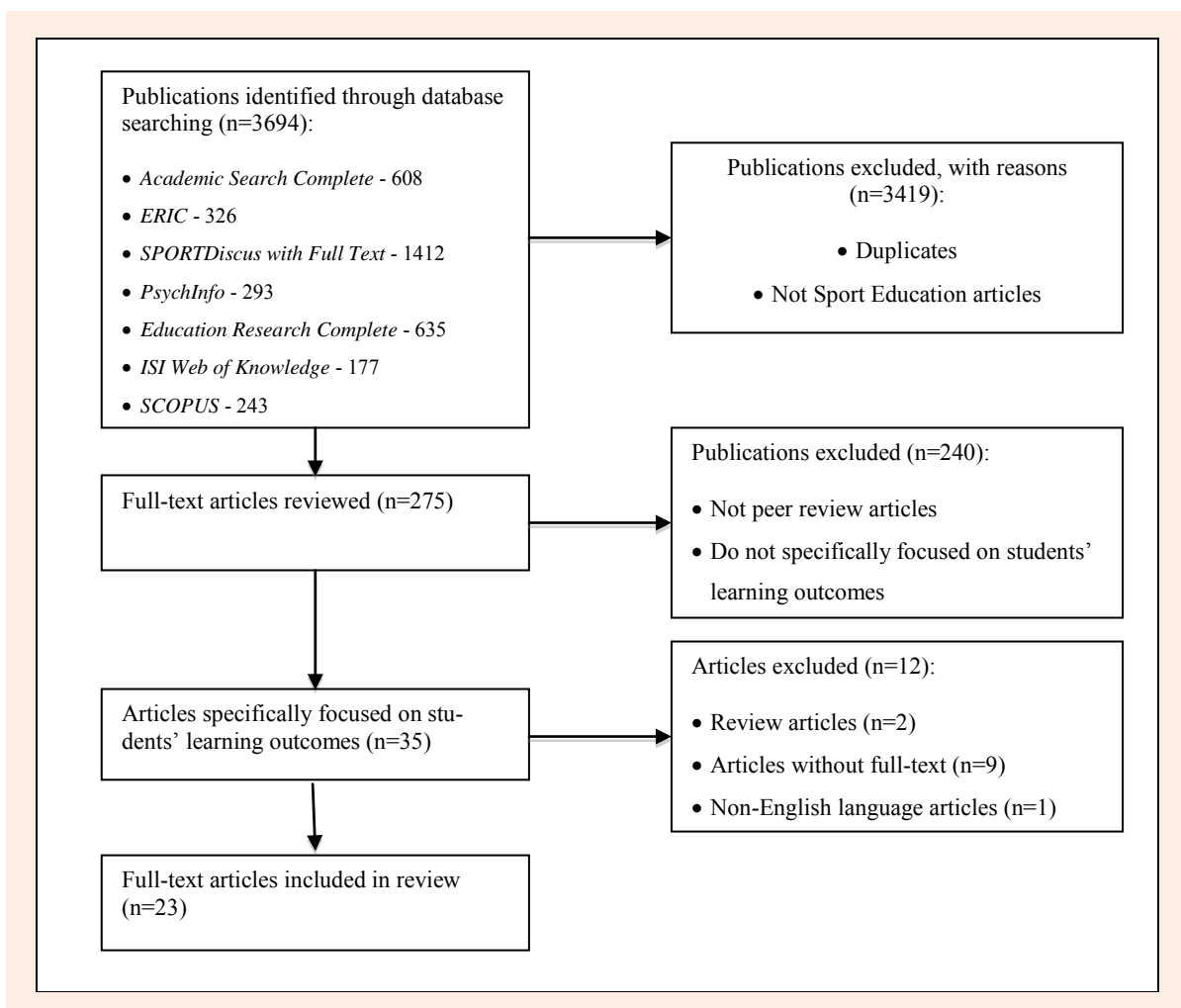
Figure 1. Decision flowchart for identified studies.

Table 1. Study quality checklist with quality scores assigned

Authors/Date	Que 1	Que 2	Que 3	Que 4	Que 5	Que 6	Quality score total/6
Grant (1992)	0	0	1	0	0	0	1
Carlson (1995)	1	0	1	0	0	0	2
Curnow & MacDonald (1995)	1	0	0	1	0	0	2
Alexander et al. (1996)	0	0	0	0	0	0	0
Carlson & Hastie (1997)	1	1	0	0	0	0	2
Hastie (1998a)	1	1	1	1	0	0	4
Hastie (1998b)	1	1	1	1	1	0	5
Alexander & Luckman (2001)	0	0	0	0	0	0	0
Hastie & Trost (2002)	1	1	1	1	0	0	4
Clarke & Quill (2003)	0	0	0	0	0	0	0
Browne et al. (2004)	1	1	0	1	0	0	3
Hastie & Curtner-Smith (2006)	1	0	0	1	0	0	2
Hastie & Sinelnikov (2006)	1	1	1	1	1	0	5
Cruz (2008)	1	0	0	0	0	0	1
Pritchard et al. (2008)	1	1	1	1	1	0	5
Brock et al. (2009)	1	0	0	0	0	0	1
Li & Cruz (2009)	1	0	0	0	0	0	1
Hastie, Sinelnikov & Guarino (2009)	1	1	1	1	1	0	5
Calderón, Hastie & Martinez (2010)	1	0	0	1	1	0	3
Mesquita, Farias & Hastie (2012)	1	1	1	1	0	0	4
Cho et al. (2012)	1	1	1	1	1	0	5
Gutiérrez et al. (2013)	1	0	0	1	1	0	3
Hastie et al. (2013)	1	1	1	1	1	1	6

Question (Que). Que 1: Did the article provide a detailed description of the program context: teacher expertise and students previous experience? Que 2: Did the study report the sources and details of outcome assessment? Que 3: Did outcome assessment instruments have acceptable reliability for the specific age group? Que 4: Did the study report the precise details of the interventions intended for each group and how and when they were actually administered? Que 5: Did the study report the precise fidelity of the intervention that was delivered to participants and was the delivered content in the true nature of the intended intervention? Que 6: Did the study report the effect size of primary and secondary outcome investigation?

the interventions intended for each group and how and-when they were actually administered? (e) Did the study report the fidelity of the intervention that was delivered to participants and was the delivered content in the true nature of the intended intervention? (f) Did the study report the effect size of primary and secondary outcome investigation? Studies scored from 0-2 were classified as "low" quality studies, from 3-4 as "moderate" quality studies, and those that scored 5-6 were classified as "high" quality studies. This assessment was performed by one of the authors of the present article as well as an external reader who had significant research in instructional models in physical education, particularly Sport Education. In order to measure the degree of reliability of the two assessments, the Cronbach's alpha was calculated. This test showed a higher agreement between the two assessments ($\alpha = 0.99$). The assessment of studies' quality is presented in Table 1.

Results

Table 2 show the 23 articles that were included in this review. The assessment of the study's quality is included in the table.

Source, grade and sport
Sport Education research considering students' learning outcomes is particularly diverse, spanning a variety of countries, the school grade in which the season was applied, and the sports studied. According to the country where the Sport Education season took place, the most frequent country was Australia (n = 7), followed by USA (n = 5), Russia (n = 2), Portugal (n = 2), Hong Kong (n = 2), Spain (n = 2), United Kingdom (n = 1) and New Zealand (n = 1). With regard to the grade level used, the most frequent were those most associated with middle school (sixth through eighth grade; n = 14), followed by high school (ninth through twelfth grade; n=7) and finally elementary school (first to fifth grade; n = 4). Team sports were the most commonly studied (n = 19), whereas only four studies incorporated individual sports (such as athletics, badminton) or dance in their seasons.

Methods applied
This research spans two distinctive methodological approaches: qualitative studies (students' and teachers' perceptions) or quantitative studies (quasi-experimental, pretest-posttest design). From Table 1 it can be seen that qualitative research has focused on three concerns: teachers' perceptions, students' perceptions, and studies that have examined both teachers and students. Four studies focused on the perceptions of teachers concerning students' learning (Alexander and Luckman, 2001; Carlson and Hastie, 1997; Curnow and McDonald, 1995; Grant, 1992). Several authors (n = 6) examined both students' and teachers' perceptions (Alexander et al., 1996; Calderón et al., 2010; Carlson, 1995; Clarke and Quill, 2003; Cruz, 2008; Li and Cruz, 2009;) and only one study has analysed students' perceptions (Gutiérrez et al., 2013). In these studies, several tools were used to

Table 2. Overview of the studies included in this review

Authors/Date	Purpose	Type of study	Dimension analysed	Participant/Setting	Data collect/analysis	Result	Quality score
Hastie et al. (2013)	Evaluate the extent to which two instructional units in physical education would lead to improvement in students' skill and technical performance and knowledge	Quantitative assessment	Skill and tactical development performance	Portugal 119 students (56 SE and 63 DI) 10th grade Equivalent of 20 track and field lessons	Skill and knowledge tests Performance measures Independent-samples t test	Despite improvements for both tests were found, SE education was more effective for shot put and hurdles. No improvements for knowledge in the traditional unit, while SE students improved their scores by more than 7%. Improvements in performance were found both units, but favouring SE.	6
Hastie (1998b)	Examine the development of skill competence and tactical awareness and student's perceptions and experiences during a SE unit	Both qualitative and quantitative assessment	Skill and tactical development Game play	USA 6 students (4 boys and 2 girls) 6th grade 30 lesson of Ultimate Frisbee	Videotape observation Student interviews	Boys had more opportunities of participation. Girls did not considered these iniquities as problematic since continued to fell a useful part of the team. Skill development was more evident to low skill-level students, while tactical development to higher skill students.	5
Hastie & Sinelnikov (2006)	Analysed participation and perceptions of students in a SE unit	Both qualitative and quantitative assessment	Skill development	Russia 37 students (18 boys and 19 girls) 6th grade 18 Basketball lessons	Videotape Interviews ANOVA Analytic induction of themes	Results showed differences according to skill level, favouring higher skill students although both groups presented above 70%.	5
Pritchard et al. (2008)	Comparison between two instructional models (SE and DI) on skill development, knowledge and game performance	Quantitative assessment	Skill and tactical development Game play	USA 47 students 9th grade 20 Volleyball lessons	Skill tests Knowledge tests GPAI MANOVA	Students' improvements in skill execution, tactical knowledge and performance. Higher improvements for SE students according to performance.	5
Hastie, Sinelnikov & Guarino (2009)	Examined the development of skill and competence and tactical knowledge during a SE unit	Quantitative assessment	Skill and tactical development	Russia 41 students 8th grade 18 Badminton lessons	Skill test GPAI Knowledge test ANOVA	Results showed improvements in skill development, performance and tactical knowledge for both boys and girls. However only according to knowledge boys didn't show higher improvements	5
Cho et al. (2012)	Investigate students' motor skill development through a SE season	Quantitative assessment	Skill development	USA 130 students: 66 sixth (35 boys and 31 girls) and 64 seventh (32 boys, 32 girls) grade students 21 (middle school classes) and 15 (junior high school classes) Volleyball lessons	Protocol for skill assessment (SCPEAP) Repeated measures ANOVA	Student volleyball form, communication, movement to ball, and effective play significantly improved throughout the season.	5

Table 2. Continued..

Authors/Date	Purpose	Type of study	Dimension analysed	Participant/Setting	Data collect/analysis	Result	Quality score
Hastie (1998a)	Studied the participation and perceptions of a cohort of girls during a SE unit	Both qualitative and quantitative assessment	Students' learning in general	USA 35 girls 5th and 6th grade 20 Floor Hockey lessons	Videotape observations of opportunities to responds Group interviews Quantitative: descriptive and ANOVA across gender Qualitative: inductive analysis	Despite results showed improvement for both sexes, boys had more opportunities to take positions of power, higher success levels and more opportunities to respond during competition phase. Nevertheless girls continued to prefer SE	4
Hastie & Trost (2002)	Student physical activity levels and skill development during a SE unit	Quantitative assessment	Skill development	19 male students Middle school 22 lessons Hockey	Accelerometers (MVA & VPA) Skill tests	Improvements for both higher and lower skill-level students	4
Mesquita, Farias & Hastie (2012)	Analyse the impact of a hybrid SE-IGCM model on students' skill and tactical development and performance	Quantitative assessment	Skill and tactical development Game play	Portugal 26 students 5th grade 22 soccer lessons	Knowledge test Game performance through GPAI Mann-Whitney e Wilcoxon	Student's improved their skill execution and tactical decisions, not only defensive but also offensive, especially for girls and low skill-level students.	4
Browne et al. (2004)	Comparison between SE and DI concerning students' learning, enthusiasm and affection	Both qualitative and quantitative assessment	Skill and tactical development	Australia 53 boys 2 8th grade classes 20 Rugby lessons	Assessment of skills by teacher and students' self-evaluation Interviews with students	SE students showed higher results concerning perceived learning and refer a better understanding of the game.	3
Calderón, Hastie & Martinez (2010)	Teacher's and students' perceptions about SE implementation in Spain	Qualitative assessment	Skill and tactical development	48 students 1 teacher 8 "*Balón Prisionero*" lessons	Teacher's diary Teacher interviews Student questionnaires Student drawings	Teacher's reported students' improvements, particularly technical and knowledge. Higher students' perceived competence in the end of the unit when compared to the beginning	3
Gutiérrez et al. (2013)	Expand the understanding of Spanish students' perceptions of SE	Qualitative assessment		Spain 270 students from nine different schools 5th to 11th grade	Student's surveys Small-group interviews ANOVA Inductive analytic methods	Students referred that they had more time to practice and play more games. By consequence, they referred more learning opportunities. Higher levels of perceived improvement in girls.	3
Carlson (1995)	Perceptions and experiences of female students to SE	Qualitative assessment	Students' learning in general	Australia 8 female students 9th grade 20 Flag football lessons	Teacher interview Student interviews Constant comparison of themes Frequencies of touches of ball	Female students improved during the season and the length of the unit was perceived as a key element to these results	2

Table 2. Continued..

Authors/Date	Purpose	Type of study	Dimension analysed	Participant/Setting	Data collect/analysis	Result	Quality score
Curnow & MacDonald (1995)	Analysis of gender iniquities on SE units	Qualitative assessment	Skill development	Australia 25 students (12 boys and 13 girls) 6th and 7th grade 9 Touch Rugby lessons	Student interviews Videotape observations Teacher diary Qualitative constant comparison of themes	More learning opportunities and powerful roles to boys	2
Carlson & Hastie (1997)	Analysis of social system within a SE unit	Qualitative assessment	Skill development	Australia 88 students 8th and 9th grade 21 Netball and Football lessons	Field notes Lesson videotape Student and teachers interviews Qualitative constant comparison of themes	Lower skill-level participants were more likely to mentioned increased physical skills.	2
Hastie & Curtner-Smith (2006)	Analyse teachers' and students' perceptions in a hybrid SE-TGfU unit	Both qualitative and quantitative assessment	Skill and tactical development	Australia 29 students (11 boys and 18 girls) 6th grade 22 batting and fielding games lessons	Critical incidents Tactical quizzes Game design forms Team interviews	All students were able to understand, appreciate and implement rudimentary tactics.	2
Grant (1992)	Teachers' perceptions about students' learning	Qualitative assessment	Skill and tactical development	New Zealand 86 teachers 10th grade 34 schools 14 sports 16-22 lessons	Teacher reflective diaries Thematic Analysis	Improvements in student decision-making and enthusiasm	1
Cruz (2008)	Analyse the views of students and teachers from their learning and teaching experiences	Qualitative assessment	Students' learning in general	Hong Kong 2 teachers 110 students Secondary school	Participant observation Filed notes Teacher reflective journal Questionnaires to students Semi-structured interviews with teachers	Teachers believed that SE would benefit students' learning outcomes.	1
Brock et al. (2009)	Explore student's social interactions and their perspectives during a SE unit: influence of student status on group interactions and decisions	Both qualitative and quantitative assessment	Students' learning in general	USA 10 students (5 boys and 5 girls) Elementaryschool 26 lessons of modified soccer	Student questionnaires Videotape and observations Informal interviews with teachers Student journals Field notes	Student's status appeared to have an influence on whose opinions counted and whose voices were heard and the decision-making process of the team captains. Low status students were silenced and those voices were no heard. The status characteristics of gender influenced the amount of playing time students received during the unit	1
Li & Cruz (2009)	Analysed teachers' and students' experiences on SE	Qualitative assessment	Skill development	Hong Kong 2 teachers 12 students 2 Basketball and Handball units	Lesson videotaping Semi-structured interviews Content analysis and constant comparison	One of the teachers referred improvements in handball skills.	1

Table 2. Continued..

Authors/Date	Purpose	Type of study	Dimension analysed	Participant/Setting	Data collect/analysis	Result	Quality score
Alexander et al. (1996)	Report of the Australian national trial of SE: program change, educational impact, inclusivity	Qualitative assessment	Skill development	Australia 53 teachers	Teachers questionnaires Videoconference with teachers Student diary Deductive analysis of themes	Improvements in skill development, especially for lower skilled students.	0
Alexander & Luckman (2001)	Teacher's perceptions about SE implementation	Qualitative assessment	Skill development	Australia 337 teachers	Teachers' questionnaires	Skill development it is difficult to achieve. When it occur favours low skill students	0
Clarke & Quill (2003)	Analysis on the ways in which SE might enhanced students' leanings	Qualitative assessment	Skill development	United Kingdom 8th grade 6 lessons	Interviews Field notes Teacher diaries	Teachers show some scepticism according to student's learning outcomes during SE units.	0

examine the perceptions of the participants such as formal and informal interviews (n = 11), reflective diaries (n = 7), questionnaires (n = 3), drawings (n = 1), and group interviews (n = 1).

In studies following qualitative measures, quasi-experimental pre-posttest designs (Cho et al., 2012; Hastie and Trost, 2002; Hastie et al., 2009; 2013; Mesquita et al., 2012; Pritchard et al., 2008) have been used in order to analyse the impact of Sport Education on students' learning outcomes. The most frequently used instruments in these designs were skill tests (n = 6), followed by tactical knowledge tests (n = 4) and systematic observation instruments to evaluate students' improvements (n = 3), such as the *Game Performance Analysis Instrument* (Oslin et al., 1998).

Mixed methods (incorporating both quantitative and qualitative assessment) were also used (Brock et al., 2009; Browne et al., 2004; Hastie, 1998a; 1998b; Hastie and Curtner-Smith, 2006; Hastie and Sinelnikov, 2006). The majority of these studies used both lesson videotapes and interviews (n = 4). Field notes (n = 1), questionnaires (n = 1), self-evaluation of skills (n = 1), critical incidents (n = 1), game design forms (n = 1) and tactical quizzes (n = 1) were also used. In these mixed methods studies both students' learning (through empirical measurement) and students'/ teachers' perceptions (through more qualitative measures) were examined.

Dimensions of students' learning
Related to the dimensions of students' learning analysed, Sport Education research have been focused on skill development, tactical development and game play. Only five studies analysed all these dimensions of students' learning (Hastie, 1998b; 2009; 2013; Mesquita et al., 2012; Pritchard et al., 2008). Beyond that, skill development was the most studied dimension of students' learning (n = 15), followed by tactical development (n = 5). Six studies reported learning outcomes, in general, that is without specifying which dimension was analysed.

Impact of Sport Education on student's learning
Research concerning the impact of Sport Education on students' learning as well as teachers' and students' perceptions about students' learning has considered students' skill-level and gender. Although research has showed students' improvements during the participation in Sport Education seasons, the outcomes remain somewhat ambiguous since some studies report superior learning outcomes for boys and higher skill-level students while other studies found superior learning outcomes for girls and lower skill-level students.

Students' learning according to gender
Gender inequity has been the focus of several investigations in physical education (e.g. Ennis, 1999; Flintoff, 2008; Nicaise et al., 2007; Williams and Bedward, 2010), where the theme of dominance of boys and higher skill-level students consistently arises (Flintoff et al., 2008; Shimon, 2005; Solmon et al., 2003; Williams et al., 2000). Within Sport Education, there is a focus on inclusion and equal participation, seeking to develop student cooperation and sharing responsibility through the use of persisting teams and seasonal responsibilities taken by all students (Siedentop, 1994). However, some authors (n=5) have reported greater learning opportunities for boys during Sport Education units (Brock et al., 2009; Curnow and McDonald, 1995; Hastie, 1998a; 1998b; 2009).

More specifically, Curnow and McDonald (1995) report a case study of an upper primary Sport Education unit in order to analyse gender inclusivity. Through the use of student's interviews, videotape observations and teacher diaries, the authors concluded that boys held more powerful roles, dominated interactions and girls were silenced. Student's freedom led to limitations on skill development, particularly amongst girls. Nevertheless, it is necessary to take into account that in this study the participation of students was not regulated and the season was short (9 lessons) considering the minimum limit of 20 lessons referred by Siedentop (1994). According to Curnow and

McDonald (1995) equity principles could be achieved from closer teacher guidance or rules to giving students equal "access to power", for instance through the rotation of all students across the allocated roles. Brock et al. (2009) explored the influence of student status on group interactions and decisions in a 26- lessons season and found that the gender influenced the amount of playing time that students received during the unit, mostly in favour of boys. These greater opportunities for boys led to a different impact of the Sport Education unit on skill competence and tactical knowledge. Focusing on skill competence and tactical knowledge during an 18-lesson Sport Education season, Hastie et al. (2009) found improvements in skill development, performance and tactical knowledge for both genders. Nevertheless, boys showed greater gains.

Researchers have become aware of these iniquities and have tried to develop wider and more adjustable curricula for both boys and girls, combining the use of Sport Education with other models that define effectively the learning tasks according to the content to be taught, i.e. hybrid models (Hastie and Curtner-Smith, 2006). This hybrid technique was evident in the Mesquita et al. (2012) study that analysed the impact of a 22-lessons Sport Education - Invasion Games Competence unit on students' skill and tactical development and game performance. The results of this study reported students' improvements in skill execution and tactical decisions (both defensive and offensive) for both boys and girls but particularly for girls. These results were explained by the closer monitoring and scaffolding from the teacher and the use of game forms present in the hybrid unit, as well as the boys' high entry performance, which promoted a ceiling effect (Mesquita et al., 2012).

Students' learning outcomes according to skill level

Students' skill level has been a variable that differentiates the impact of Sport Education on students' learning outcomes. From anecdotal data, two studies reported perceptions of higher learning opportunities to higher skill-level students (Alexander and Luckman, 2001; Alexander et al., 1996), which have been corroborated by studies using quantitative measures (n = 3; Brock et al., 2009; Hastie, 1998b; Hastie and Sinelnikov, 2006). Other studies (n = 2) have reported higher learning opportunities for lower skill-level students (Carlson and Hastie, 1997; Mesquita et al., 2012).

In particular, Alexander et al. (1996) and Alexander and Luckman (2001) analysed teachers' perceptions (n = 53 and n = 377 respectively) about students' learning during Sport Education. Teachers suggested that higher learning opportunities were afforded to higher skilled students, a belief that has been substantiated by the study of Brock et al. (2009) who through systematic observation of lessons showed that lower skill-level students were silenced and their voices were rarely heard. The results obtained by Hastie and Sinelnikov (2006), who analysed the participation and perceptions of students during the participation in a Sport Education season lasting 18 lessons, found similar

outcomes. Despite both groups reporting participation levels above 70%, results favoured higher skill-level students. These greater learning opportunities for higher skill-level students led to a differentiating effect of Sport Education according to skill level. Hastie (1998b) focused on the analysis of student's learning outcomes found that lower skill-level students only had opportunities to technical development whilst higher skill-level students had more opportunities for tactical development. In a study of Ultimate Frisbee, Hastie (1998b) focused on the analysis of student's learning outcomes found that lower skill-level students only had opportunities to technical development while higher skill-level students had more opportunities for tactical development. As Hastie (1998b) reported, while the lower and medium-skilled players in particularly showed improvements in controlling the disk and being able to throw accurate passes, it was only the medium and higher skilled players who made improvements in passing decision making.

In a different line of results, through the application of a hybrid model, Mesquita et al. (2012) found that lower skill-level students had lower values when compared to middle and higher skill-level students at the beginning of the unit. However, these differences faded at the end of the unit and therefore the authors suggested that lower skill-level students benefited most from the unit. These conclusions support the findings of previous investigations (Carlson and Hastie, 1997) in which improvements were also substantial for lower skill-level students.

Discussion

The aim of this study was to report what is currently known about students' learning when participating in Sport Education units in order to make judgements as to the directions that future research and practice might follow. The actual attainment of inclusivity in Sport Education may not always match the stated goals of the model (Kinchin et al., 2001). Parker and Curtner-Smith (2012b) support these claims as they confirmed the prevalence of hegemonic masculinity, masculine bias and sexism within Sport Education. From Sport Education research according to students' learning outcomes a differentiating effect of students' gender and skill-level was found. Teachers and students reported superior learning opportunities for boys and higher skill-level students due to the apparent dominance of these students in the social and instructional agenda (Alexander and Luckman, 2001; Alexander et al., 1996; Curnow and McDonald, 1995), which is substantiated by empirical measurement (Brock et al., 2009; Hastie, 1998a; 1998b; 2009; Hastie and Sinelnikov, 2006). Nevertheless, in some studies, girls did not consider these differences as problematic and continued to prefer Sport Education over more traditional models of instruction in physical education (Hastie, 1998a; 1998b). Girls considered themselves as important and useful to their teams and suggested that boys' dominance within instructional tasks allowed for the improvement of all

students since they ensured the quality of the game.

Other studies (Carlson and Hastie, 1997; Mesquita et al., 2012) revealed greater learning opportunities for girls and lower skill-level students. However, these Sport Education units were specifically designed using hybrid models, completed with more monitoring from the teacher in order to minimize the upward of higher skill-level students within learning tasks. These inconsistent results can be explained by factors not considered in the Sport Education research, such as the effect of time on students' learning and the control of the teaching-learning process within Sport Education units.

Effect of time on students' learning outcomes

Research suggests that skillful game play takes time and therefore the length of the unit plays a key role in students' learning outcomes (Hastie, 1998a; 1998b; Hastie et al., 2013; Mesquita et al., 2012; Pritchard et al., 2008). The complexity of the organization of activities within Sport Education (distributing roles, establishing formal competition, allocating students to teams, among others) while important and necessary, also has an impact on the time available for learning. By consequence, shorter units leave less time for learning and improvements, and can be counterproductive to the development of skill performance (Hastie et al., 2013). In the case of studies in this review in which teachers indeed reported some scepticism about students' improvements during Sport Education units (Clarke and Quill, 2003; Curnow and McDonald, 1995). These perceptions are actually supported by students' empirical assessment as Hastie et al. (2009) who notes the "analysis of the decision-making components of the GPAI data showed that the students had little tactical sophistication in their play until the end of the season" (Hastie et al., 2009, p. 139). Moreover, in the study of Hastie et al. (2013) shorter units were proven to be ineffective. It would appear then, that units longer than the typical physical education units (18-20 lessons), as well as a careful control of lesson time (for instance, establishments of rules and routines within the lesson) are essential to achieve students' learning outcomes in Sport Education. All those studies that followed these criteria showed improvements in Sport Education units. Literature in teaching in physical education support these claims, emphasizing the critical role of the length of the unit and, consequently, the number of positive practice trials in skill development (Hastie et al., 20011). Nevertheless, educational authorities across the globe continue to limit the time that can be spent on one particular sport in physical education (Hastie et al., 2013).

Nevertheless, longer units cannot by themselves overcome the differentiating effect of gender and skill-level. Indeed, even following Siedentop's (1994) recommendations, student improvements in Sport Education units are still ambiguous, with some studies reporting higher opportunities afforded to boys and higher skill-level students and others to girls and lower skill-level students. The application of more than one unit consecutively over time may benefit the dynamics of social and instructional system that occur within working groups (teams) and consequently improve student's learning

(Wallhead and O'Sullivan, 2005). It is therefore not surprising that several authors consider the urgency in studying the impact of Sport Education with a longitudinal data collections protocol, which extends past the end of one or two units (Hastie et al., 2011; Wallhead and O'Sullivan, 2005). However, to date, its dearth persists and until now no study has focused on students' learning outcomes past a one-season experience (Hastie et al., 2011).

Moreover, within the Sport Education research gathered for this review, few articles indicated the time between the assessment moments and the Sport Education unit. Only five studies refer the days between the assessment moments (pretest and posttest) and the unit. In two studies (Hastie et al., 2013; Li and Cruz, 2009) the assessment of skill, tactical development and performance are realized immediately before (pretest) and after (posttest) the Sport Education unit. In other two studies (Hastie and Trost, 2002; Hastie et al., 2009) the initial evaluation is realized during the first lessons whilst the final evaluations take place during the final lessons of the unit. Beyond that, almost all of the studies have only analysed improvements before and after the unit, rarely measuring for changes during the unit which is crucial to implementing remedial pedagogical strategies that might allow for greater student learning. Only two studies (Hastie et al., 2009; Pritchard et al., 2008) utilized a mid-test in order to access the evolution of students' improvements during a unit. Finally, most of the research focused on the educational impact of Sport Education model does not consider the application of a retention test. In fact, this test is perhaps crucial for a more accurate assessment of all students' improvements (Haerens and Tallir, 2012; Magill, 2011) than simply a post-test. From the analysis of the empirical research focused on the impact of Sport Education on students' learning, only one study considered the application of a retention test (Mesquita et al., 2012). In this study, the highest student improvements were found in the second posttest and students continued to improve from the first to the second posttest.

Control of the teaching-learning process

The devolution of content knowledge from the teacher to the student-coach and student-coach leadership skills have been identified as potentially problematic for content development during peer-teaching tasks (Hastie, 2000; Wallhead and O'Sullivan, 2007). Despite this concern and the calls for the analysis of the teaching-learning process (Hastie, 2000; Hastie et al., 2011; Wallhead and O'Sullivan, 2005), researchers have still fallen short in this area. To date, research on Sport Education has only focused on students' learning outcomes and students' and teachers' perceptions. These types of studies are potentially problematic since there is a lack of interpretation of the results concerning students' learning. Indeed, the studies are limited to the number of lessons, the sport selected for the seasons under examination, the characterization of the Sport Education unit and the content presented within each of the lessons (e.g. Hastie, 1998a; 1998b; Mesquita et al., 2012). Additionally, other authors have added instruction and treatment validity to validate that the instruction was indeed consistent within the Sport Educa-

tion standards (Calderón et al., 2010; Hastie and Sinelnikov, 2006; Hastie et al., 2009). Therefore, more research concerning the teaching-learning process, particularly according to the dynamics of the peer-teaching tasks and the control of the content to be taught within Sport Education units is needed.

Dynamics of the peer-teaching tasks
Despite not being specifically related to students' learning, the dynamics of the peer-teaching tasks have potential influence on learning outcomes. In fact, opportunities for learning are seen as a complex relationship between the students' social task system and the instruction task system (Doyle, 1977). Although not specifically related to students' learning, some studies in this review reported the occurrence of inequities during Sport Education units, particularly during the competition phase (Brock et al., 2009; Curnow and McDonald, 1995; Hastie, 1998a; Parker and Curtner-Smith, 2012a; 2012b). More specifically, boys and higher skill-level students are dominantly positioned over girls and lower skill-level students. Examples include taking most of the leadership roles, controlling game play, making most of the decisions, claiming best times and spaces in the gym, and usurping girls who were placed in leadership roles (Brock et al., 2009; Curnow and McDonald, 1995; Hastie, 1998a; Parker and Curtner-Smith, 2012b; 2012a). Beyond that, the teachers in the studies reviewed seem to do little to disrupt or dismantle this pattern, thereby reinforcing traditional gender roles and expectations and considering these inequities as normal (Parker and Curtner-Smith, 2012a; 2012b). Future research and Sport Education implementation should contemplate the control of students' participation in order to guarantee equitable participation (e.g. rotate roles throughout the unit; examining social relationships between students within peer-teaching tasks).

To date, there have only been two studies that considered the analysis of the teaching-learning process (Hastie, 2000; Wahl-Alexander and Curtner-Smith, 2013). Hastie (2000) analysed a Sport Education unit from an ecological perspective and found high levels of student engagement in all dimensions under analysis (instruction and management system). According to Hastie (2000), these results can be explained by an inspection of Sport Education's specific features, namely, the management system (in which protocols were carefully defined), the student social system (driven by team affiliation with all students working toward common goals) and the content-embedded accountability (where all tasks performed during the Sport Education unit counted toward a team's score). These results were supported by Wahl-Alexander and Curtner-Smith (2013) who examined the influence of negotiations between students and preservice teachers on instruction during multi-activity curriculum and Sport Education lessons. Within multi-activity lessons, negotiations were common and negative, increased as the unit progressed, and adversely influence the preservice teachers' practices. Sport Education negotiations were relatively positive and occasional, declined throughout the season and enabled the preservice teachers to provide quality physical education lessons.

Through the study of the dynamics of the peer-teaching tasks it would be possible to detect weaknesses in the implementation of the Sport Education, which strengthen this model. More specifically, with the study of these dynamics it would be possible to detect and reduce weaknesses in the social system operating within the groups and achieve an effective program of action through the alignment of the students' social system and the instructional system. All of this could be achieved without decreasing the strength of the social system (i.e. avoiding the oppression exercised by student-coaches on their peers) (Hastie, 2000; 2012).

Control of the content to be taught
The primary concern of Sport Education is the pedagogical environment as is teacher and students' roles. In essence, in his development of the model, Siedentop (2004) desired the promotion of a more democratic and inclusive pedagogy in order to provide richer and authentic sports experiences in physical education (Siedentop, 1994). In this way, during a Sport Education unit there is a need to control the content to be taught, particularly through the application of hybrid models and protocols which promote the devolution of leadership and knowledge from the teacher to student-coaches. To date, this issue has been scarce in the research designs, reported in the literature.

The call to address the content knowledge domain has already been somewhat answered through alliances between Sport Education and other instructional models. Examples included hybrids between the Teaching Games for Understanding (Hastie and Curtner-Smith, 2006), the Invasion Games Competence Model specifically for the invasion games (Mesquita et al., 2012) and the Step Game Approach for Volleyball (Mesquita et al., 2005). In these hybrid units, the lesson structure followed Sport Education principles (persisting teams, formal competition and student roles) whilst lesson tasks followed the didactical framework of the other instructional model. However, to date only two studies have reported outcomes from hybrid approaches (Hastie and Curtner-Smith, 2006; Mesquita et al., 2012). In the first study Hastie and Curtner-Smith (2006) examined the teacher's and students' perceptions and experiences during a hybrid Sport Education – Teaching Games for Understanding unit. The participants in this study were 29 sixth-grade students who participated in a 22-lesson batting/fielding games season. Students were reported to be able to understand, appreciate and implement rudimentary batting and fielding game tactics. Mesquita et al. (2012) analysed the impact of a hybrid Sport Education - Invasion Games Competence model on student's skill and tactical development and game performance. In this study, 26 fifth-grade students participated in a 22-lesson soccer unit. Results revealed students' improvements in skill execution and tactical decisions, both defensive and offensive. Game scores were particularly significant for girls. These results suggest the benefits of the application of Sport Education simultaneously with other didactic models specifically designed to teach the technical and tactical performance in team sports.

Student-coaches' content knowledge and pedagog-

ical content knowledge (Shulman, 1987) have been identified as potentially problematic during peer-teaching tasks. Through a defined didactic research methodology (Amade-Escot, 2005), Wallhead and O'Sullivan (2007) found a misalignment in the emergence of the didactic contract during peer-teaching tasks. In that study student-coaches showed difficulties in elaborating content through appropriate demonstration, error diagnosis and task modification. These difficulties caused problematic breaches in the didactic contract during peer-teaching tasks. Beyond that, insufficient leadership skills of the student-coaches in the peer-teaching tasks have been enhanced by research, such as management skills and equity principles (Alexander and Luckman, 2001; Brock et al., 2009). Thus, Sport Education implementations must be aware of how the devolution of leadership skills from the teacher to student-coaches' is made, and the issue itself becomes a priority in the research agenda. The difficulties associated with student-coaches' knowledge and leadership skills emphasize the need to provide more effective student-coaches' preparation. That is, protocols which examine the devolution of knowledge and leadership from the teacher to student-coaches should be examined within Sport Education research. Indeed, this is imperative given Siedentop's (1995) claim that "a void exists in how to identify, teach, and provide practice for the leadership skills necessary for successful coaching within the tasks of the Sport Education curriculum" (Siedentop, 1995, p. 22).

Conclusion

Sport Education research has shown the robustness and strengths of the model in providing richer experiences to students' in the context of physical education. Nevertheless, this article has shown several gaps in Sport Education research which may help to explain the variable results concerning students' learning. The control of the content to be taught has emerged as one of those gaps. Despite research which has considered alliances between Sport Education (focused on pedagogical environment) and instructional models that define the learning tasks to be implemented considering the specificity of the sport to be taught (Hastie and Curtner-Smith, 2006; Mesquita et al., 2012), more research applying these hybrid approaches is needed. Moreover, difficulties associated with student-coaches' content and leadership skills have been identified as problematic within Sport Education research. Therefore, future research should define, implement, and evaluate protocols for student-coaches' preparation in order to understand the influence of this issue on students' learning.

Another gap identified was the effect of time on students' learning outcomes, which has not been completely controlled. In fact, research within Sport Education has reinforced the influence of learning time (both the length and the number of units) on students' learning. Although learning time is essential for any instructional approach, it takes particularly prominence within Sport Education. Sport Education units with greater than 20 lessons and the application of more than one unit conse-

quently over time may serve to improve the dynamics of social and instructional system that occur within working groups, and consequently improve students' learning. Furthermore, research within Sport Education focused on students' learning has used mainly one final evaluation, which does not allow the assessment of the retention of students' improvements. As noted there is evidence that when research considers application the of a retention test, students' improvements are found to be superior (Mesquita et al., 2012). Future research may therefore consider the application of a retention test in order to a more complete assessment of students' improvements.

The analysis of students' improvements when considering gender and skill level separately has also shown a bias in the results of students' learning. Indeed, it is possible to observe that girls are usually the lower skilled students at the beginning of the units (Hastie et al., 2009; Mesquita et al., 2012), which demonstrate that skill level might be influenced by students' gender. Brock et al. (2009) showed two girls with high status in all the categories (such as, personality, economic level, attractiveness, athletic, etc.), making almost all the decisions for the team, and silencing the rest of the players of their team. However, to date, there has only been one study that simultaneously considered gender and skill level (Hastie, 1998b) (lower skilled female, medium skilled make, higher skilled female and higher skilled male). Future studies should therefore consider the interaction of gender and skill level in the analysis of students' learning improvements in order to obtain a more realist portrait of the impact of Sport Education.

This review has also demonstrated that the analysis of students' learning has been centred on a superficial assessment of the teaching-learning process. Indeed, Sport Education research regarding students' learning has focused mainly on the assessment of students' improvements through the use of quasi-experimental (pretest-posttest), descriptive and exploring (students' and teachers perceptions), in order to obtain performance measures. This review has shown large gaps since it is possible to identify the performance level achieved by the students, but it doesn't allow access to the problems operating within the instructional, social and management agenda. For instance, the dynamics within the working groups should be considered in order to better understand students' learning opportunities. Only through understanding these dynamics would it be possible to understand the teaching-learning process and guide future Sport Education implementation. Appropriate studies would include those that examine if learning opportunities provide inclusion and equity participation, if the instruction given by the student-coach is sufficient to address the problems that emerge during peer-teaching tasks, or if students' status within working groups is based in equitable principles and inclusion, among others. In order to reach an understanding of the teaching-learning process, it is necessary to therefore use research designs that attend to the complexity of this process. Action-research and case studies are two particularly research designs with the potential to fill this void and provide a richer description of Sport Education implementation. Particularly, action-

research designs allow a close monitoring in the implementation of pedagogical approaches (Casey and Dyson, 2009), such is the case of Sport Education model, and allow teachers to achieve better and further-reaching results when it is used to achieve pedagogical change (Van Looy and Goegebeur, 2007).

Since the Hastie et al. (2011) review in which limitations and future research directions were provided, some of areas of research on Sport Education have not yet been examined in full, particularly the need for longitudinal data collection and the deep analysis of student peer instruction. These limitations might explain the lack of more complex, long lasting and perhaps more expensive research designs.

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Key points

- Despite research regarding has showed students' improvements during the participation in Sport Education seasons, it remains somewhat equivocal.

- The studies included in this review show students' improvements on skill, knowledge and tactical development, as we as game play, during the participation in Sport Education units.

- Some studies report superior learning opportunities to boys and higher skill-level students while other studies exposed superior learning opportunities to girls and lower skill-level students.

- The effect of time on students' learning and the control of the teaching-learning process within Sport Education units can explain these equivocal results.

- Future research is encouraged to consider the implementation of protocols for student-coaches' preparation, hybrid models, a retention test, the interaction of gender and skill level, and use research designs that attend to the complexity of the teaching-learning process.

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