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Review article

What Actually Differs between Traditional Teaching and Sport Education in Students' Learning Outcomes? A Critical Systematic Review

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Abstract
This systematic review aimed to examine the main findings concerning to the investigations focused on compare, within Physical Education context, the influence of Sport Education (SE) and Traditional Teaching (TT) on students' learning outcomes. A literature search was conducted on nine electronic databases (PubMed, Google Scholar, Web of Science, SCOPUS, Academic Search Ultimate, ERIC, Education Source, APA PsycINFO and APA PsycARTICLES). Inclusion criteria were defined before the selection process. Accordingly, were only included articles that (i) were published in peer-reviewed international journals indexed in Journal Citation Reports or Scientific Journal Rankings; (ii) were available in full-text; (iii) were published in English, Portuguese or Spanish; (iv) were performed within Physical Education context; and (v) provided specifically a comparison between the effects of SE and TT on students' learning outcomes. Globally, twenty-eight studies met the inclusion criteria. The manuscripts' methodological quality was assessed through Downs and Black checklist, with all studies displaying moderate quality. Results showed that comparisons among SE and TT tend to analyze team sports activities sampling high-school students via quasi-experimental designs, with more than half of them were published over the past five years. Also, these investigations typically focused on the differences between both models on the development of personal and social skills, as well as its impact on the motor and cognitive domains. In this respect, although the results tend to point out increases in both SE and TT, superior values are achieved when SE is implemented. The analysis of the teaching-learning process using alternative research methods and designs (i.e., experimental studies, qualitative data, longitudinal analysis, action-research and case studies), longer units with appropriate planning, and the report of model´s fidelity so that robust findings can endorse the teachers' praxis, must be a concern in future studies.

Key words: Instructional models, physical education, comparative analysis, sport pedagogy, teacher-centered approach, student-centered approach.

Introduction

Across the last three decades, the research has been investigated on how different teaching models may impact on students' learning through the building of high-quality learning environments (O'Sullivan, 2013). Retrospectively, Physical Education (PE) evolved across the 1980s in response to the socio-political reform movements that were characteristic of that decade. Accordingly, teaching approaches moved from teacher-centered (e.g., direct instruction model) which were based on behavioristic assumptions, to student-centered (e.g., Sport Education) built upon constructivist and social learning theories (Dyson, 2014; O'Sullivan, 2013). Within a socio-constructivist perspective, the learner is placed at the core of the learning process, playing an active role in building his/her knowledge and developing autonomy and responsibility skills (Perkins, 1999). In this sense, the teacher's role is re-adjusted, acting as a *facilitator* of learning who uses informal and implicit instructional strategies to guide the discovery of the learning process (Goodyear and Dudley, 2015).

Aligned with the socio-constructivist premises, and following the conceptual and practical evolution in PE, the Sport Education (SE) model (Siedentop, 1994) was developed as a learner-centered teaching model. Since its conceptualization, SE has been undeniably a hot topic in the field of PE research. In contrast to teaching-centered approaches that place teachers on 'center-stage', and consider learners as motion reproducers, SE aims principally to develop competent (i.e., tactical and technically skilled to participate in game-forms), literate (i.e., aware of sport traditions, rules as well as good and bad sports practices) and enthusiastic (i.e., motivated to preserve the sports culture) sportspersons (Siedentop et al., 2020). In doing so, SE engages concomitantly motor, cognitive, social and emotional domains, all contributing to the holistic development of the learners (Araújo et al., 2014; Bessa et al., 2019; Hastie et al., 2011b; Wallhead and O'Sullivan, 2005).

Overall, SE was designed to recreate the key features of the institutionalized sport context. In this sense, learners usually perform other roles besides player, including for instance coach, team manager, or referee roles. SE, therefore, is a curriculum and instruction model designed to afford an authentic, educational and thereby rich sport experience. Specifically, learning tasks in SE are carefully organized to underline cooperative work, problem-solving, critical reflection, and learner interaction experiences (Siedentop et al., 2020). Due to the wide range and complexity of the learning activities, from a structural viewpoint SE requires seasons of at least 18 lessons. Globally, seasons are designed according to six main characteristics, namely, affiliation (work on common goals), seasons (longer units than typical PE units) formal competition (meaningful games), culminating events (recognition of those who excel), record keeping (built-in feedback) and festivity (celebration) (Siedentop, 1994).

The relevant advantages identified in implementing SE have been attributed to its structural features, such as: (i) the authentic recreation of the sport context (i.e., competitive seasons, formal competition, teams, etc.) which

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increases the motor, cognitive, and emotional engagement of learners (Mesquita et al., 2014), (ii) the competition, which portrays as a useful educational tool enabling the development of tactical knowledge and game performance (Layne and Hastie, 2014; Mahedero et al., 2015), (iii) the reduced exclusion of learners, by balancing the opportunities of participation through the building of authentic and meaningful competitive game-forms (Farias et al., 2017), and (iv) the learner as an active voice throughout their own learning process and the reinforcement of teamwork which, in turns, promotes the development of personal and social competences (Smither and Zhu, 2011).

Given the high number of studies that have sought to empirically test the purported benefits of SE, systematic reviews have been conducted to summarize the key research findings, support practitioner's pedagogical intervention, and guide future research avenues (e.g., Araújo et al., 2014; Bessa et al., 2019; Hastie et al., 2011b; Wallhead and O'Sullivan, 2005). In this respect, the systematic reviews undertaken so far have emphasized the positive benefits of SE in improving learners' responsibility, cooperation, and trust skills (Bessa et al., 2019). Also, systematic reviews have depicted how SE expanded enormously over the last five years to include all learning domains: physical, social, cognitive, and affective (Evangelio et al., 2018), as well as how studies focusing on SE have tended to progress to more sophisticated designs and larger sample sizes (Hastie et al., 2011b).

Despite the extensive research focus on SE, the Traditional Teaching approach (TT), which is linked to a more teacher-centered approach, is also frequently adopted by PE teachers (Gubacs-Collins, 2015). The TT involves a teaching style where decisions concerning planning, instruction, and assessment are made by teachers with little or none student input (Mosston and Ashworth, 2008). Thereby, within the TT, the teacher is completely in charge of all instructional decisions about didactical content development, class management, learner accountability and learner engagement (Metzler, 2017). Thus, in order to potentiate task efficacy and the time-class available, the teacher assumes full control of events by defining rules and behavioral patterns that learners must follow. Contrary to how SE structures its classes, the TT classes are typically structured through time-periods, with the teacher presenting the expected movement patterns. In this sense, the motor and cognitive domains are highlighted due to its assumption that some level of proficiency in elementary motor skills is necessary before proficient engagement in more complex game-forms (Rink, 1993).

Overall, the TT has a preference for high-structured learning tasks, as it allows close observation by the teacher who critically examines the learners' movement patterns and skills performed, reinforces correct responses, and gives corrective feedback when incorrect responses are identified (Metzler, 2017). Learners are thus expected to replicate movement patterns, answering to specific, and punctual questions. This teaching approach involves, thereby a low-cognitive engagement as students' cognitive processes are only recruited when they receive information from the teacher and internalize it (McMorris, 1998).

Given its instructional and structural features (e.g., skills-drills, lines or circuit organization), the TT is largely recognized to be efficient in promoting active participation of learners due to its repetitive practice emphasis (Hastie et al., 2011a). In addition, it is seen as helpful in motor domain as it focuses on developing motor skills through progressions (e.g., close motor skills), as well as in earlier stages of learning (i.e., novice learners) (French et al., 1991; Sweeting and Rink, 1999). Finally, the frequent and ongoing teacher's feedback featured of TT has been identified as an important tool to provide in-time correction of a learners' movements and actions (Metzler, 2017).

With the purpose of understanding the influence of SE and TT on the learning outcomes of different domains (e.g., game performance, affiliation, enjoyment, etc.), some studies have been conducted to contrast both models (e.g., Browne et al., 2004; Rocamora et al., 2019). Commonly, these studies claim a superiority of SE over TT. However, despite the well-reported benefits from SE, its advantages in comparison to TT are still under-developed. The novelty and scientific contribution of this systematic review grounds precisely on the need to synthesize evidence for extending and update the comprehension about what it currently knew, and what remains unclear in the literature. By doing so, this review also avoids the ongoingly false speculation and / or overly optimistic assumptions not supported by scientific evidence, while guiding future research avenues.

Previous reviews about the impact of SE have irrefutably contributed to summarize the available evidence concerning the main aims of PE, namely fitness and tactical awareness (Hastie et al., 2011b), students' learning (Araújo et al., 2014), students' competence, literacy and enthusiasm (Hastie and Wallhead, 2016), learning outcomes (Evangelio et al., 2018), and more recently, students' personal and social development (Bessa et al., 2019). Accordingly, due to the progressive amount of investigations dedicated to compare the influence SE and TT on students' learning outcomes, summaries of the main empirical research findings are constantly required to update our understanding about the effects of its practical application. Also, knowing the benefits and weaknesses of each teaching model is possible to extend the comprehension of their effects on students' learning domains, as well as the understanding of how the teaching models might be used and combined to optimize learning processes. Despite many systematic reviews have summarized the main findings about the impact of different teaching approaches, up to this date were not find any quantitative or qualitative review that has specifically compared, contrasted, and debated the impact of SE and TT on students' learning which reinforces the innovative character of the present review.

Aligned with the aforementioned rational, this study sought to assess the main findings concerning to the investigations devoted to compare the influence of SE and TT on students' learning outcomes. Four research questions supported this review, namely:

(Q1) Which contexts were predominant in investigations that aimed to compare SE and TT on students' learning outcomes?

(Q2) What were the most frequently variables analyzed when comparing a SE season and a TT unit?
(Q3) What were the methods predominantly used to compare the influence of SE and TT on students' learning outcomes?
(Q4) Have these investigations been concerned about established the fidelity of the models' implementation?

Methods

Data sources and search strategy

This systematic review followed the recommendations stated by Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher et al., 2015). An exhaustive and systematic search was conducted through nine scientific literature databases (PubMed, Google Scholar, Web of Science, SCOPUS, Academic Search Ultimate, ERIC, Education Source, APA PsycINFO and APA PsycARTICLES) for papers published up to, and including, June 2020. The English Boolean data types "AND" and "OR" were used to combine the following terms: "physical education", "sport education", "direct instruction", "traditional teaching", "traditional instruction", "traditional model", "multiactivity instruction", "instructional approaches" and "pedagogical models". Afterwards, the reference lists of the selected articles were screened for potentially suitable articles to include in the review. The study selection was independently carried out by two experienced authors to minimize any potential selection bias. Both were knowledgeable of instructional models in PE. The reviewers were not blinded to the authors' list, institutions, or journals of publication. Any discrepancies were resolved by consensus. Also, study abstracts that did not offer adequate information considering the eligibility criteria predefined were retrieved for full-text evaluation.

Inclusion/exclusion criteria

Following the recommendations of Simonsohn et al. (2013) eligibility criteria were defined before the electronic search. Also, to promote the quality assurance, and given the possibility of it had not been subjected to independent and peer-review, books, book chapters, conference abstracts, thesis, and dissertations were excluded from analysis. Aligned with this, articles published in non-peer-reviewed journals and/or those not indexed in Journal Citation Reports or Scientific Journal Rankings were also disregarded. Also, based on the study's purpose, the investigations that did not measure specifically the influence of TT and SE on students' learning outcomes, were not conducted within the PE context, or used exclusively qualitative data, were also excluded. Thus, peer-reviewed studies were included according to the following criteria: (i) provide a comparison between SE and TT on students' learning outcomes, (ii) were available in full-text, and (iii) were written in English, Portuguese or Spanish language. Notwithstanding, after reading the titles and the abstracts, articles were included or excluded based on the criteria above mentioned.

Data extraction and codification of the studies

Content analysis was conducted on the manuscripts selected to record authors' names, year of publication, study context (i.e., countries, interventional context, sport type), study design (i.e., length of the units/season) sample characteristics (i.e., participants, grade and class composition), statistical methods, variables assessed, fidelity of the model implemented, and main findings.

Methodological quality assessment

An evaluation of the methodological quality of the selected studies was accomplished using the validated Downs and Black (1998) checklist. This scale enables researchers to highlight the strongest and weakness points of each study and assess both cross-sectional and longitudinal investigations (Bento, 2014). The checklist includes 27-items that aim to assess the reporting, validity, and statistical power of the published manuscripts. Specifically, items 1-10 relate to reporting, items 11-13 refer to external validity, items 14-26 relate to internal validity and item-27 attends the statistical power. The quality of the studies was classified adapting the criteria applied by Grgic et al. (2018). Accordingly, studies were classified as "good quality" if they scored 20-27 points, "moderate quality", if they scored 11-19 points, and "poor quality" if they scored < 11 points. Two independent researchers evaluated the studies selected. The final ratings were discussed among the research team (first author and co-authors), with discussion and agreement for any observed differences. No study was excluded due to a significantly low-quality assessment score.

Table 1. Categories and legends.

Category	Legends
Author(s)/ Country	Identifies the authors, the year and the country where the study took place
Purpose	Describes the purpose of the study
P - Participants	St – Students T – Teachers
SP-School Population	M – Middle School H – High School U - University
CL - Classes	Sx – Single Sex Classes Mx – Mixed Sex Classes
S – Sport	The sport form used TS – Team Sport IS – Individual Sport
DES– Study Design	QT – Quantitative MIX – Both qualitative and quantitative E – Experimental QE – Quasi-experimental
LS - Length of the SE Season	Number of lessons
F - Fidelity of the SE model	Fidelity measures are reported: Y – Yes N – No
Variables	Variables that were analyzed across the study
Main Results	Main results of the study provided by the author/s
Q – Study Quality	Methodological quality of the study

Results

Studies selection

The search stages and the study selection procedures are depicted in Figure 1. A total of 28 studies met the inclusion criteria and were included in the present systematic review. Detailed information of the studies selected are presented in alphabetical order in Table 2. With the aim of achieving the study's purpose, the review categories were defined a priori (Harris et al., 2014). These categories are described in Table 1 and used as labels in Table 2.

Methodological quality

The average score on the Downs and Black checklist was 13 (range 11-14). All studies included were assessed as having moderate methodological quality. Specifically, one study was scored with 14 points, seventeen studies with 13 points, seven studies with 12 points and three studies with 11 points (Table 3).

Overview of articles and study background

Research dedicated to compare the influence of SE and TT on students' learning outcomes took place mostly in Spain (n = 12; 43%) and in the United States (n = 8; 29%), followed by Portugal (n = 3; 11%), China (n = 2; 7%), Australia (n = 2; 7%) and the United Kingdom (n = 1; 3%).

Overall, throughout the SE competitive seasons, team-sports (such as volleyball, soccer, or handball) were frequently studied (n = 22; 79%), whereas only six studies (21%) incorporated individual sports (e.g., track in field).

Most of the studies were conducted for less than 18 lessons (15; 54%) in the units/seasons examined. Specifically, 13 studies (46%) analyzed units/seasons for more than 18 lessons, 8 studies (28%) extended between 13 and 17 lessons, with the remaining 7 studies (25%) examining between 8 and 12 lessons. Most investigations recorded data only from students (27; 96%).

Globally, the studies selected encompassed a sample of 3281 students (1615 boys and 1538 girls, with two studies not specifying the gender of 128 participants) and 46 teachers (7 were preservice teachers). Concerning the grade level examined, the high-school (i.e., ninth to twelfth grade) was typically investigated (17; 61%), followed by middle-school (i.e., sixth to eighth grade, 9; 32%), and the remaining 2 studies (7%) were conducted in the university. Also, 26 studies (93%) were in a co-educational PE context, with 2 studies (7%) examining only boys in a single-sex context. Class composition was not reported in 2 of the selected studies (7%). Of interest, none of the studies reported including participants with disabilities.

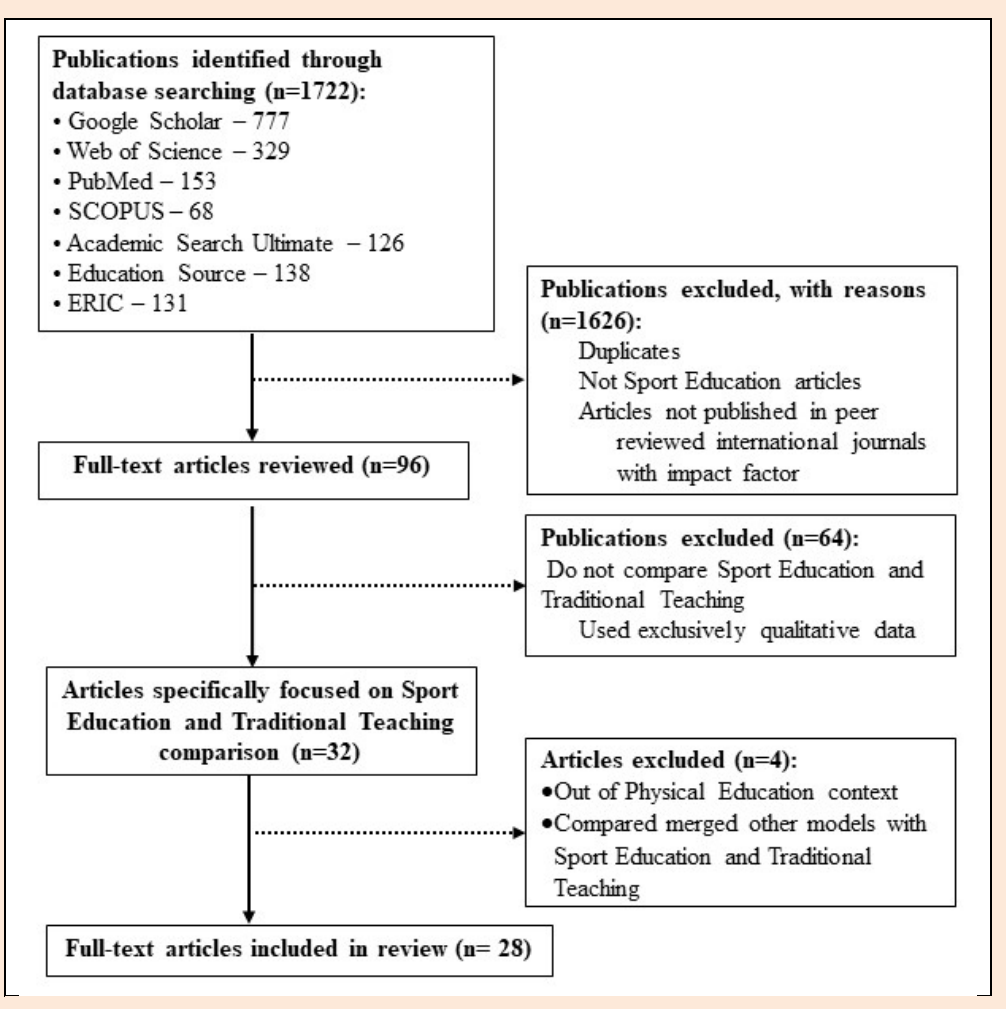

Figure 1. **Study flowchart.**

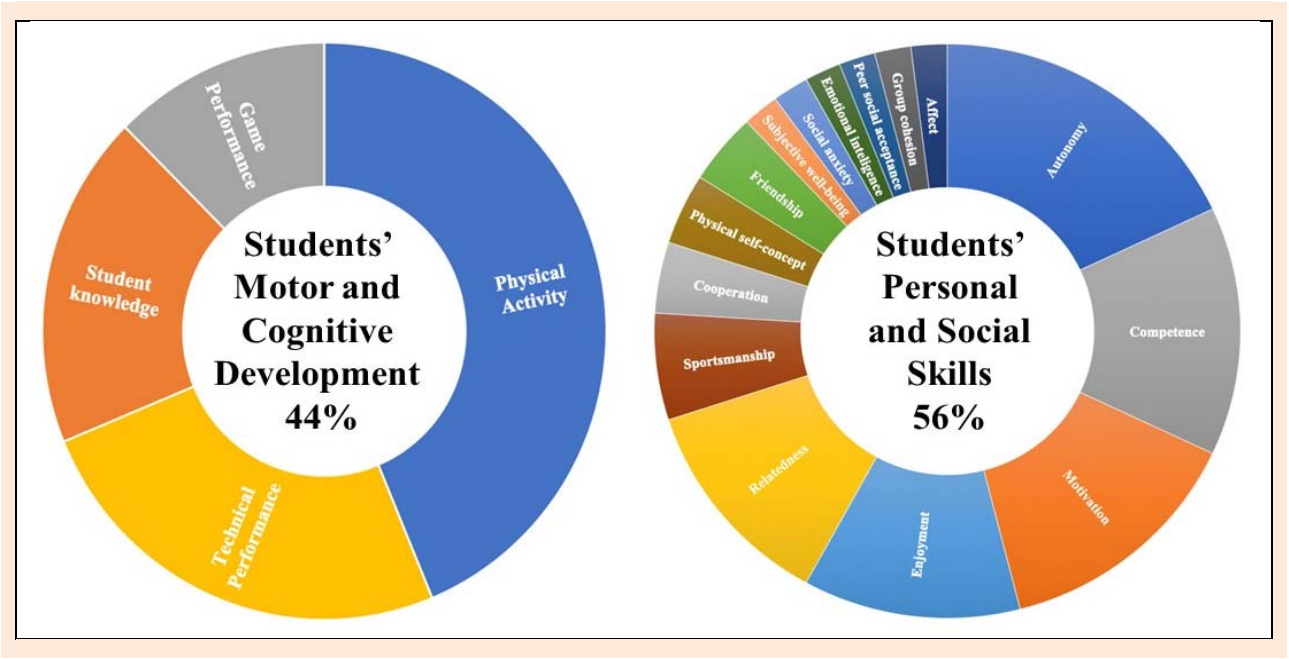

Figure 2. Variables examined in studies comparing SE and TT.

Variables

The Figure 2 provides an illustration about the range of variables examined by the studies included in this systematic review.

Methodological procedures to collect data

Apart from two articles that resorted to a mixed method (Browne et al., 2004; Xu et al., 2019) (7%), all studies selected followed a quantitative approach (26; 93%). Most of the studies (21; 75%) used a quasi-experimental, pre-test and post-test design, to compare SE and TT. The remaining 7 studies (25%) utilized an experimental design. The use of questionnaires (20; 54%) was the most reported instrument in the extracted studies. Other data sources included systematic observation (5; 13%), accelerometers (4; 11%), written tests (3; 8%), students' interviews (2; 5%), critical incidents (1; 3%), body composition measures (1; 3%) and teacher evaluations (1; 3%). Data collection from the mixed-methods study combined the use of interviews, written tests, and questionnaires.

Fidelity of the models implemented

In 15 of the selected studies (54%), the fidelity of the models implemented was reported. That is, the authors performed the validation of the model applied presenting a detailed description of the program and curricular elements of the unit (Hastie and Casey, 2014). In the remaining 13 studies (46%), the authors presented only a description of the program or curricular elements of the unit, failing to carry out the model validation. Accordingly, an assessment of instruction according to the accepted standards for each model was not confirmed.

Discussion

This review sought to summarize and examine the main findings from the studies that compared the influence of SE and TT on students' learning outcomes, in order to provide directions for future research and practice. Overall, studies tended to analyze Spanish and American data, as well team sports activities with high-school samples. Also, investigations focused typically on the differences between both models on the enhancement of personal and social skills and motor and cognitive factors. From a methodological viewpoint, the studies were most likely to adopt quasi-experimental designs, in which half of the studies did not report the fidelity of the model implemented.

Findings about studies background

The comparative research between SE and TT included in this systematic review was published between 2004 and 2020 with an increasing number of publications over the last five years. Specifically, more than half of the studies were carried out between 2015 and 2020. Back in 2005, Wallhead and O'Sullivan (2005) called precisely for comparative studies. Although authors have not immediately consider these suggestions (Hastie et al., 2011b), researchers are currently showing interest in this subject. Specifically, the pertinence of these theme is justified by the need to (i) expand knowledge about the models and their differentiated effects on learning variables or school levels, (ii) adopt different methodologies or statistical procedures, (iii) implement in other countries or contexts, and (iv) overcome the limitations identified in previous studies.

Although scientific investigations have also been developed in other countries, namely in Portugal, Australia, China and United Kingdom, most of the reviewed studies used Spanish or US data. This findings is congruent with the outcomes of previous reviews (Bessa et al., 2019; Evangelio et al., 2018), despite the undeniable importance of expanding the impact of SE to another contexts and cultures. However, in reason of the flexibility demonstrated by SE, we strongly emphasize the relevance of investigate the differences among schools, teachers, sport season, instead of countries (Curtner-Smith et al., 2021). Accordingly, future investigations could address this issue.

Table 2. Characteristics of included studies.

Author(s)/Country	Purpose	P	SP	CL	S	DES	L	F	Variables	Main results	Q
Browne et al., (2004) AUSTRALIA	Examine the impact that two instructional approaches (TT and SE) to teaching rugby had on students' learning, enjoyment and affection.	St	M	Sx (Boys)	TS	MIX/QE	20	N	Student Learning Enjoyment Affect	- Both groups made significant improvements in their knowledge of the game as well as their skill. -The interview data provide repeated references that suggest the clear majority of students from both classes enjoyed their unit, regardless of the way it was taught. - SE students expressed an increased feeling of ownership and commitment to the process as well as increased feeling of being part of a team.	12
Burgueño and Medina-Casaubón (2020) SPAIN	Examine the influence of SE on sportsmanship orientations in high school students.	St	H	Mx	TS	QT/E	16	Y	Sportsmanship	- Significant improvement of four of the five sportsmanship orientations (i.e., respect for social conventions, respect for rules and referees, full commitment, and respect for opponents) after a SE season.	13
Burgueño et al., (2018) SPAIN	Examine the influence of SE on basic psychological need satisfaction in the sport teaching-learning process that takes place in PE.	St	H	Mx	TS	QT/QE	12	Y	Basic psychological needs (Autonomy Competence Relatedness)	- SE significantly improved the levels of autonomy, competence and relatedness need satisfaction in the inter-group analysis and in the intra-group analysis.	13
Burgueño et al., (2017) SPAIN	Examine the influence of an intervention based on SE, in comparison with TT, on motivational regulation in high school students in PE class.	St	H	Mx	TS	QT/QE	12	N	Situational motivation (intrinsic motivation, identified regulation, external regulation, and amotivation)	- SE group increased significantly in intrinsic motivation, identified regulation and decreased amotivation, external regulation - TT group increased in external regulation and amotivation and decreased in intrinsic motivation and identified regulation	13
Cuevas et al., (2015) SPAIN	Analyze the impact of SE in psychological basic need satisfaction in PE secondary students.	St	H	Mx	TS	QT/QE	19	Y	Basic psychological needs (Autonomy, Competence and Relatedness)	- Significant improvements in competency for SE group; TT group decreased. - Increased in autonomy and relatedness for both groups but not significantly.	13
Cuevas et al., (2016) SPAIN	Analyze the impact of the SE in self-determination and motivation, psychological basic need thwarting, enjoyment-satisfaction, boredom, and intention to be physically active in PE secondary school students in Spain.	St	H	Mx	TS	QT/QE	19	Y	Motivational regulation (intrinsic motivation, identified regulation, introjected regulation, external regulation, and motivation) Psychological need thwarting (thwarting competence, thwarting autonomy, thwarting relatedness) Intention to be physically active Satisfaction-enjoyment Boredom Self-determination	- Significant improvements in intrinsic motivation in the SE group. - Although changes were not found to be significant for the other variables: slight improvements were noted in self-determination and identified regulation in the SE group; small changes were observed in the satisfaction- enjoyment and need thwarting of competence variables in the SE group.	13

P = participants, St = students, T = teachers, SP = school population, M = middle school, H = high school, U = university, CL = classes, Sx = single-sex, Mx = mixed-sex, S = sport, TS = team sports, IS = individual sports, DES = study design, QN = quantitative, MIX = qualitative and quantitative, E = experimental, QE = quasi-experimental, LS = length of the Sport Education season (number of lessons), F = fidelity of the model, Q = methodological quality of the study.

Table 2. Continue….

Author(s)/Country	Purpose	P	SP	CL	S	DES	L	F	Variables	Main results	Q
Fernandez-Rio et al., (2013) SPAIN	Examine the effects of three instructional approaches in secondary education students' physical self-concept after the implementation of an ultimate learning unit.	St	H	Mx	TS	QT/QE	12	N	Physical self-concept	- Students in the TT and SE groups increased their physical self-concept from initial to final tests, but not significantly.	13
Hastie et al., (2013) PORTUGAL	Examine the relative effectiveness of 2 forms of PE instruction on students' skill and technical performance, as well as content knowledge in 3 track and field events.	St	H	Mx	IS	QT/QE	20	Y	Technical performance Content knowledge	- Although both groups improved significantly their technical performance from pretest to posttest, the SE classes outperformed the TT classes in both technique and skill execution. - Only the SE group made significant improvements in content knowledge.	13
Hastie et al., (2009) USA	Investigate changes in students' aerobic fitness levels following a season of SE.	St	M	Mx	IS	QT/QE	15	N	Aerobic Fitness Levels	- SE group with higher increases than TT group; significant differences between both models (TT group with small improves).	13
Kao (2019) CHINA	Analyze the impact of a SE unity on team cohesion (within effect), and compare team cohesion between a TT method and a SE unit (between effects).	St	U	Mx	TS	QT/QE	+20	N	Team Cohesion (teamwork, team adaptation, interpersonal interaction)	- SE group made significant improvements on team cohesion after the course; all post-test scores were higher than those for the TT group; - TT group did not notice significant improvements on team cohesion or any subscale.	12
Luna et al., (2020a) SPAIN	Evaluate the impact of an educational intervention on social competence and social acceptance among adolescent.	St	H	Mx	TS	QT/E	16	N	Social competence Peer social acceptance	- SE group presented more significant improvements in some indicators of social competence and social acceptance among peers than those obtained with the TT.	14
Luna et al., (2020b) SPAIN	Evaluate the impact of a physical-SE pilot programme on adolescents' subjective well-being (health-related quality of life, positive and negative affect), trait emotional intelligence and social anxiety	St	M	Mx	TS	QT/QE	18	N	Subjective well-being (positive affect and negative affect) Psychosocial adjustment (depression, anxiety and social stress)	- SE group had significant improvements in the affective component of subjective well-being and a reduction in anxiety.	13
Parker & Curtner-Smith (2005) USA	Compare the health-related fitness benefits for pupils participating in SE and traditional multiactivity (MA) units of instruction.	St	M	Mx	TS	QT/QE	10	Y	Physical activity	- Students in the MA unit spent slightly more than the recommended 50% of lesson time in moderate to vigorous physical activity (MVPA) while the pupils in the SE unit did not approach this level.	11

P = participants, St = students, T = teachers, SP = school population, M = middle school, H = high school, U = university, CL = classes, Sx = single-sex, Mx = mixed-sex, S = sport, TS = team sports, IS = individual sports, DES = study design, QN = quantitative, MIX = qualitative and quantitative, E = experimental, QE = quasi-experimental, LS = length of the Sport Education season (number of lessons), F = fidelity of the model, Q = methodological quality of the study.

Table 2. Continue….

Author(s)/Country	Purpose	P	SP	CL	S	DES	L	F	Variables	Main results	Q
Méndez-Gimenez et al., (2015) SPAIN	Compare the effects of three different instructional models: TT, SE and SE with Self-Made Materials on PE students' motivation and sportsmanship.	St	M/H	Mx	TS	QT/QE	12	N	Achievement goals (mastery approach, performance approach, performance avoidance, mastery avoidance) Friendship Basic psychological needs (autonomy, competence and relatedness) Fair-play (sportsmanship)	SE group presented: - Significant increases in autonomy, competence and relatedness. - Significant increases in friendship. - Significant increases in performance-avoidance goals. - Significant increases in social conventions, rules and officials, and opponent. TT group: - Increased but not significantly in performance avoidance-goals, in friendship avoidance. - Increased significantly in rules and officials, but not significantly in social conventions and opponent. - Increased significantly (less than SE group) in autonomy and competence (not in relatedness)	13
Pereira et al., (2016) PORTUGAL	Examine the effects of SE and Direct Instruction on students' content knowledge in three track and field events (hurdles, triple jump, and shot put) considering their gender and skill level.	St	M	Mx	IS	QT/QE	20	Y	Student knowledge	- Significant knowledge improvements in both instructional approaches irrespective of students' gender and skill level.	12
Pereira et al., (2015) PORTUGAL	Examine students' technical performances improvements in three track and field events (hurdles, shot put, and long jump) following either a SE season or a Direct Instruction unit.	St	M	Mx	IS	QT/QE	20	Y	Technical performance	- SE students of both genders and skill levels improved significantly in all events. - Direct Instruction group presented significant improvements but limited to boys and students of higher skill level.	12
Perlman (2010) USA	Examine the influence of Sport Education on amotivated students affect and needs satisfaction.	St	H	Mx	TS	QT/QE	15	Y	Basic psychological needs (autonomy, competence and relatedness) Enjoyment	- Amotivated students in SEM perceived higher levels of enjoyment and satisfaction than students taught by the traditional approach. - Significant differences between groups for relatedness, with significant improvements for SE group - There were no differences in the need for autonomy and competence. - Both groups presented decreases on these variables, from pre- to post-test.	13

P = participants, St = students, T = teachers, SP = school population, M = middle school, H = high school, U = university, CL = classes, Sx = single-sex, Mx = mixed-sex, S = sport, TS = team sports, IS = individual sports, DES = study design, QN = quantitative, MIX = qualitative and quantitative, E = experimental, QE = quasi-experimental, LS = length of the Sport Education season (number of lessons), F = fidelity of the model, Q = methodological quality of the study.

Table 2. Continue….

Author(s)/Country	Purpose	P	SP	CL	S	DES	L	F	Variables	Main results	Q
Perlman (2011) USA	Examine the influence of SE on students' self-determined motivation and underlying psychological need(s) in PE.	St	H	Mx	TS	QT/QE	20	Y	Self-Determined Motivation (Intrinsic Motivation, Identified Regulation, External Regulation and Amotivation Basic Psychological needs (Autonomy, Competence and Relatedness)	- Significant differences on the self-determination index between groups, with higher improvements for students in SE group. - Significant differences between groups for relatedness, with significant improvements for SE group. - Lack of significant differences between groups for autonomy and competence; - TT group presented increases only on competence.	13
Perlman (2012) USA	Examine the physical activity differences between amotivated students engaged in the SE compared with a TT sportbased physical education class.	St	H	Mx	TS	QT/E	15	Y	Physical activity levels	- Engagement within the SE provided amotivated students with an increased opportunity to engage in higher levels of physical activity.	13
Pritchard et al., (2008) USA	Study the effects of SE and the TT instructional approaches on skill development, knowledge, and game performance of the sport of volleyball.	St	H	-	TS	QT/E	20	Y	Technical performance Student Knowledge Game Performance Game involvement	- No significant difference between models for technical performance (SE group increased in all skills, TT group did not in setting skill). - No significant difference between models for knowledge and game involvement (both variables increased). - Significant differences between models for game performance with increases for SE but decreases for TT.	13
Rocamora et al., (2019) SPAIN	Assess the effects of two instructional approaches, SE and Direct Instruction (DI) on students' physical activity intensity levels, game performance, and friendship goals.	St	M	Mx	TS	QT/E	15	Y	Physical activity Game performance Friendship	- Sedentary PA levels were significantly higher in the DI group. - Light and moderate PA levels were significantly higher in the SE group. - Increased values for SE group in friendship-approach and friendship-avoidance goals - In the DI group, only girls increased significantly in friendship-avoidance goals. - Significant gains in both study groups for game performance, but larger in the SE group.	13
Segovia & Gutierrez (2020) SPAIN	Evaluate the effects on schoolchildren's body composition of a game-based high intensity interval training.	St	M	Mx	TS	QT/QE	15	N	Body composition (waist circumference and body fat percentage)	- GB-HIIT is effective in modifying the body composition of primary school children. However, the methodology used to implement the GB-HIIT program (SE or TT) had no impact on the findings.	12

P = participants, St = students, T = teachers, SP = school population, M = middle school, H = high school, U = university, CL = classes, Sx = single-sex, Mx = mixed-sex, S = sport, TS = team sports, IS = individual sports, DES = study design, QN = quantitative, MIX = qualitative and quantitative, E = experimental, QE = quasi-experimental, LS = length of the Sport Education season (number of lessons), F = fidelity of the model, Q = methodological quality of the study.

Table 2. Continue….

Author(s)/Country	Purpose	P	SP	CL	S	DES	L	F	Variables	Main results	Q
Spittle & Byrne (2009) AUSTRALIA	Investigate the influence of SE on student motivation.	St	H	Mx	TS	QT/QE	20	N	Intrinsic motivation (enjoyment/interest, effort/importance, perceived competence, and pressure/tension) Goal orientations (task orientations and goal orientation) Perceived motivational climate (performance climate and mastery climate)	- Significant difference between the conditions on changes in perceived competence, task orientation, and mastery climate, with the Traditional condition decreasing significantly from pre- to post-test compared with the SE condition. - No significant differences between conditions on interest/enjoyment, effort/importance, pressure/tension, ego orientation, or performance climate.	12
Viciana et al., (2020) SPAIN	Examine the effect of a PE-based SE program on personal and interpersonal variables, social environment, and the predisposition of acquiring positive habits and autonomy in high-school students in order to assess the contribution of this model to the students.	St	H	Mx	TS	QT/E	12	N	Motivation Satisfaction Perceived physical fitness Effort and improvement Relatedness Cooperative learning Classroom climate Sportsmanship Intention to be physically active Autonomy	- Compared with the TT group, SE participants had a statistically significant increase in self-determined motivation toward PE, satisfaction toward sport, physical self-concept, relatedness with others, cooperative learning, classroom climate, sportspersonship, autonomy and acquisition of habits (autonomy support, and the intention to be physically active).	13
Wahl-Alexander & Chomentowski (2018) USA	Determine changes in college-aged students' aerobic fitness levels following participation in a university physical conditioning course.	St	U	Mx	IS	QT/QE	26	Y	Physical activity levels	- Students who participated in the SE condition experienced significantly greater improvements in the number of PACER laps when compared to the TT group. In addition, students in this same condition significantly decreased their one-mile run time during their enrolment in this course.	12
Wallhead & Ntoumanis (2004) UK	Determine the effect of SE and TT approach, to teaching a unit of games-based activity in physical education.	St	H	Sx (male)	TS	QT/QE	8	N	Enjoyment Perceived effort Perceived competence Motivational climate Autonomy	- Students in the SE curriculum group reported significantly higher postintervention enjoyment and perceived effort than those taught with the TT.	11
Wallhead et al., (2014) USA	Examine the effect of a high school-required program taught using SE on students' perceived effort and enjoyment in physical education, physical activity intentions, and leisure-time physical activity.	St	H	Mx	TS	QT/QE	25	N	Student Learning enjoyment affect	- SE participants reported greater increases in perceived effort and enjoyment than did the students taught within the TT. - Limited support for the direct transfer of motivation from a sport education program to increases in leisure-time physical activity behavior.	11
Xu, Gao & Xu (2019) CHINA	Investigate the impact of SE on students' skills and attitudes in table tennis course in high school.	St	H	-	IS	MIX/QE	16	N	Table tennis skills Students' attitudes	- Both classes (SE and TT) made significant improvements in their skills, while SE students made more progress in forehand drive and serve than TT students did.	13

P = participants, St = students, T = teachers, SP = school population, M = middle school, H = high school, U = university, CL = classes, Sx = single-sex, Mx = mixed-sex, S = sport, TS = team sports, IS = individual sports, DES = study design, QN = quantitative, MIX = qualitative and quantitative, E = experimental, QE = quasi-experimental, LS = length of the Sport Education season (number of lessons), F = fidelity of the model, Q = methodological quality of the study.

Table 3. Study quality checklist with quality scores assigned.

Author(s)/Date	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q14	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Quality Score
Browne et al. (2004)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	0	0	0	UTD	0	12
Burgueño & Medina-Casaubón (2020)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Burgueño et al. (2018)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Burgueño et al. (2017)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Cuevas et al. (2015)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Cuevas et al. (2016)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Fernandez-Rio et al. (2013)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Hastie et al. (2013)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Hastie et al. (2009)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Kao (2019)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	0	0	0	UTD	0	12
Luna et al. (2020a)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	1	0	1	1	1	1	1	1	1	0	0	UTD	0	14
Luna et al. (2020b)	1	0	1	1	0	1		1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Méndez-Gimenez et al. (2015)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Parker & Curtner-Smith (2005)	1	0	1	1	0	1		1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	0	0	0	0	UTD	0	11
Pereira et al. (2016)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	0	0	0	UTD	0	12
Pereira et al. (2015)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	0	0	0	UTD	0	12
Perlman (2010)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Perlman (2011)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Perlman (2012)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Pritchard et al. (2008)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Rocamora et al. (2019)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Segovia & Gutierrez (2020)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	0	0	0	UTD	0	12
Spittle & Byrne (2009)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	0	0	0	UTD	0	12
Viciana et al. (2020)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	1	0	0	UTD	0	13
Wahl-Alexander & Chomentowski (2018)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	1	0	0	0	UTD	0	12
Wallhead & Ntoumanis (2004)	1	0	1	1	0	1		1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	1	0	0	0	0	UTD	0	11
Wallhead et al. (2014)	1	0	1	1	0	1	1	0	0	1	UTD	UTD	UTD	0	0	0	1	1	1	1	0	1	0	0	0	UTD	0	11
Xu et al. (2019)	1	1	1	1	0	1		1	0	0	1	UTD	UTD	UTD	UTD	0	1	1	1	1	1	1	0	0	0	UTD	0	13

Question (Q). Q1: Is the Hypothesis/aim/objective clearly described? Q2: Are the main outcomes to be measured clearly described in the Introduction or Methods section? Q3: Are the characteristics of the participants included in the study clearly described? Q4: Are the interventions of interest clearly described? Q5: Are the distribution of principal confounders, in each group of subjects to be compared, clearly described? Q6: Are the main findings of the study clearly described? Q7: Does the study provide estimates of random variability in the data for the main outcomes? Q8: Have all the important adverse events, that may be a consequence of the intervention, been reported? Q9: Have the characteristics of patients lost to follow-up been described? Q10: Have actual probability values been reported for the main outcomes except where the probability value is less than 0.001? Q11: Were the subjects asked to participate in the study representative of the entire population from which they were recruited? Q12: Were those subjects who were prepared to participate representative of the entire population from which they were recruited? Q13: Were the staff, place, and facilities where the patients were treated, representative of the treatment the majority of patients receive? Q14: Was an attempt made to blind study subjects to the intervention they have received? Q15: Was an attempt made to blind those measuring the main outcomes of the intervention? Q16: If any of the results of the study were based on 'data dredging', was this made clear? Q17: In trials and cohort studies, do the analysis adjust for different lengths of follow-up of patients, or in case-control studies, in the time period between intervention and outcome the same for cases and controls? Q18: Were the statistical tests used to assess the main outcomes appropriate? Q19: Was the compliance with the interventions reliable? Q20: Were the main outcome measures used accurate (valid and reliable)? Q21: Were the patients in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited from the same population? Q22: Were the study subjects in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited over the same period of time? Q23: Were study subjects randomized to intervention groups? Q24: Was the randomized intervention assignment concealed from both patient and health care staff until was complete and irrevocable? Q25: Was there adequate adjustment for confounding in the analysis from which the main findings were drawn? Q26: Were losses of patients to follow-up taken into account? Q27. Did the study have sufficient power to detect a clinically important effect where the probability value for a difference being due to chance is less than 5%?

Overall, the findings revealed that when comparing the students' learning outcomes in a SE and TT season/unit, the high- and middle-school students in co-educational classes were the most studied. In fact, we did not find any investigation within elementary school settings that specifically compares TT with SE. In this respect, despite the difficulties of implementing SE in the earliest grade levels (Layne and Hastie, 2016), the research has been suggested potential for introducing SE in the elementary education (Gutierrez et al., 2014; Layne and Hastie, 2013; Layne and Hastie, 2016; Martínez de Ojeda et al., 2019). From the above, and for a better perception of the impact of different teaching approaches at early ages, we recommend that future investigations develop studies in primary education that provide comparisons between SE and TT. Additionally, the implementation of other research designs, such as action-research or case studies, could be adopted. Indeed, given its potential to interpret and contextualize in-depth a particular and complex phenomenon (in this case, the impact of SE throughout all learning stages), the use of action-research or case studies could enable to move forward on sport pedagogy research field.

Consistent with other reviews involving SE (Araújo et al., 2014; Bessa et al., 2019; Hastie et al., 2011b), team sports (basketball, volleyball, handball, soccer, ultimate frisbee and ringo) are frequently more investigated than individual sports (table tennis, fitness and track in fields). For this reason, there is the possibility of undervaluing different results from studies utilizing individual sports. Moreover, such research tendency displays quite a paradoxical on. That is, given the nature and purpose of team sports, the personal and social skills are inherently needed and developed over the practice. In contrast, individual sport activities do not implicitly promote the enhancement of personal and social skills. However, these skills are equally needed in individual sports and should be largely examined, particularly as SE is exclusively a team-based curriculum model.

Findings about the development of students' personal and social skills

When studies compared the influence of both teaching models on students' learning outcomes, one of the most analyzed dimensions was the development of students' personal and social skills. Although PE is widely recognized as contributing to students' motor development and healthy lifestyles, it has also played a crucial role on the development of positive attitudes and values that immensely contribute to personal and social students development (Hardman et al., 2014; Weiss, 2011). In fact, pupils endowed with superior personal and social skills acquired throughout their formal education are seen as being successful learners (Barr and Lewin, 1994; Sibley and Etnier, 2003) who smoothly integrate into society and transition easily to adulthood (Taggart, 1988; Wright and Craig, 2011).

Among the studies examined, the following variables were identified relative to the development of personal and social skills: autonomy (e.g., Cuevas et al., 2015); motivation (e.g., Cuevas et al., 2016), competence, relatedness (e.g.,Viciana et al., 2020), enjoyment/satisfaction (e.g., Browne et al., 2004), sportsmanship (e.g., Méndez-Gimenez et al., 2015), physical self-concept (Fernandez-Rio et al., 2013), cooperation (e.g.,Viciana et al., 2020), friendship (e.g., Rocamora et al., 2019), group cohesion (e.g., Kao, 2019), self - efficacy, peer social acceptance (Luna et al., 2020a), emotional intelligence, social anxiety, subjective well-being (Luna et al., 2020b), and affect (Perlman, 2010).

An overview of the variables examined in the different studies (namely, competency, enjoyment, relatedness, and friendship), suggest a tendency for their increase regardless of the model applied. A possible explanation for such findings regards to the fact that these variables are generally associated with effective teaching, and specifically linked to the teacher's pedagogical effectiveness (Stronge et al., 2011). In this sense, it is worthwhile to emphasize that the pedagogical approach used by a teacher can be more effective than a good model (Rink, 1993). Indeed, independent of the teaching approach, the teacher should have pedagogical competencies with respect to class management, discipline, climate or instruction, thus being able to use different strategies that enable him/her to respond appropriately to students' current needs (Casey et al., 2020).

On the other hand, motivation and autonomy were variables consistently higher in SE seasons. These results are possibly due to the structural characteristics of the model (e.g., competition as an educational tool, learner as an active core in the learning process) in enhancing these competencies. Moreover, there was a tendency of not finding differences between both models (or finding a decrease after a SE season) in variables associated with discipline (i.e., following rules, respect or helping others). Two main reasons can help to interpret these findings. First, these variables are mainly associated with a teacher's pedagogical effectiveness and not specifically related to the potential of each teaching model. Second, we must not confuse basic concerns, such as "helping others", with collaborative learning (organization by teams, group affiliation, etc.).

Findings about students' motor and cognitive development

Another dimension commonly examined by comparing the impact of SE and TT on students' learning outcomes relates with the motor and cognitive domains. Measures included physical activity (e.g., Rocamora et al., 2019; Wahl-Alexander and Chomentowski, 2018), technical performance (e.g., Hastie et al., 2013; Xu et al., 2019), and game performance (e.g., Pritchard et al., 2008). Sport specific content knowledge was also measured (e.g., Browne et al., 2004; Pereira et al., 2016).

The results portrayed by the abovementioned indicators tend to point out increases in SE and TT, however higher values are observed when SE is implemented. This finding suggests that, even with more time spent by students managing their teams and assuming different roles, there are significant learning gains resulting from these cooperative team practices. Compared to TT, from a technical viewpoint, the instructional interactions promoted by SE

intertwined with the students' engagement with the subject matter (MacPhail et al., 2008) seems to display a positive impact on students' technical improvements (Pereira et al., 2016). Also, within physical activity, it was noted that even without direct teacher control, the features of involvement (more cooperation, autonomy, responsibility, mutual engagement) enhances student commitment. This finding supports the assumption that competition and collaboration are crucial to provide meaningful stimulus to the students. With regards to specific sport content knowledge, the perceived advantage of using SE arises through greater cognitive involvement of students during the teaching-learning process. Possibly, this is a consequence of how the model is (i) conceptualized (i.e., student-centered), (ii) structured (e.g., authentic recreation of sport context) and didactically conceived (i.e., using guide discovery to enhance problem-solving and decision-making).

Findings about methodological issues

In terms of study design, the influence of each teaching model on students' learning outcomes has been typically conducted using quasi-experimental (nonrandomized controlled design), pre-test and post-test designs. This finding is in agreement with other reviews involving SE (e.g., Araújo et al., 2014; Bessa et al., 2019; Chu and Zhang, 2018). Since the majority of the investigations are conducted within the educational context, the already formed classes in schools may partly explain the difficulty to randomize the participants what consequently justifies the scarce use of experimental designs, broadly recognized as the highest-quality designs (Seel, 2012). Despite the undeniable contributions of the included pre- and post-test design investigations, these only identified the final performance levels achieved by students. That is, these studies did not include access to the dynamic teaching-learning process developed in the classroom, the social agendas of the students, or the teaching strategies used over time. Only through the understanding of these pedagogical dynamics it would be possible to comprehend in-depth the teaching-learning process and guide the implementation of future pedagogical models. In this sense, the present systematic review reinforces the call of Hastie and Mesquita (2016), who highlighted the need to analyze the teaching-learning process, the suggestion of Hastie et al. (2011b) to conduct experimental studies, as well as the recommendation of Araújo et al. (2014) to carry out longitudinal studies.

While the recommended length of a SE season, at the high- and middle-school levels, is a minimum of 18 lessons (Siedentop et al., 2020), most studies did not reach this target. Despite the positive results achieved by the SE, units of longer duration could lead to significant differences between the models analyzed. Concerning SE, seasons need to be long enough to allow meaningful experiences, particularly since SE has more to accomplish (Siedentop, 1994). Therefore, considering the main SE's assumptions, to succeed and ensure more reliable results, future research must prioritize appropriate planning and designing of the units/seasons.

Although the exclusion of qualitative studies is in line with the purposes of this systematic review, once qualitative data disable the metric comparison among learning outcomes, we recommend that future review articles focus on other research questions that enable the inclusion of qualitative studies. In fact, qualitative analysis could help to understand the process of the change inherent to learning, as well the perceptions and feelings of students and teachers when SE and/or TT are implemented.

Findings about the fidelity of the models' implementation

Regarding the fidelity of the implementation, Hastie and Casey (2014) considered that for an accurate and complete understanding of a study's results, the methods section should include a rich description of the curricular elements of the unit, a detailed validation of model implementation, and a comprehensive description of the program context. Even though the research highlights the importance of reporting the fidelity of the model implemented (Ko et al., 2006), fourteen studies presented only a description of the program and curricular elements of the unit. This gap in teaching models research has already been mentioned by different authors (e.g., Bessa et al., 2019; O'Donnell, 2008). Accordingly, the present systematic review emphasizes that the assessment of the model's fidelity must be a concern in future research because (i) it allows readers to moderate the relationship between an intervention and its outcomes, and additionally (ii) its assessment may prevent potentially false conclusions.

Concerning the analysis of the methodological quality, all the selected studies were identified with moderate quality (i.e., scored among 11 and 19 points) (Grgic et al., 2018). Despite this trend, the average score was relatively low (i.e., 13-points out of 27-points). This finding suggests that caution should be applied when interpreting the results of each study in order to avoid potentially false conclusions which may be introduce a certain bias in the PE literature. Additionally, the Downs and Black scoring criterion clarify that if the information provided in the study does not explicitly state a certain requested methodology for a particular item, it must be scored as not satisfying the criterion what could also justifies the low scoring. Specifically, the methodological rating criteria that were most frequently not satisfied in the included studies were related to blinding, randomization, power, representativeness of the sample group, and the adjustment for confounding factors in data analysis.

By comparing the main findings of the investigations dedicated to contrast the practical implementation of antagonist models (i.e., teacher-centered vs student-centered) on students' learning outcomes, it is noted a clear and positive expression of SE over TT. Nevertheless, far beyond the traditional idea of comparing models, tendentially favoring one in detriment of other, a broadly perspective is currently required so that the combined use of the strengths of each model can help to solve the unpredictable challenges inherent to a teaching-learning process. To achieve this integrative perspective, firstly models should be understood as pedagogical tools and at the service of learning, and we must counter the "one-size-fits-all" approach since the idiosyncratic nature of contexts, students,

and teaching content requires the intertwining use of more formal and/or informal strategies (Hastie and Mesquita, 2016). Absolutist perspectives must be thus avoided (Entwistle and Entwistle, 1991) in favor of the relativistic ones, in which multiple possibilities complement each other and are appropriate to the particular stage of students learning.

A limitation that should be recognized in the current investigation refers to the inclusion of investigations exclusively conducted within PE context, which might limit our understanding about how the comparison of both models can impact on students learning within other informal learning environments (e.g., Wahl-Alexander and Morehead, 2017).

Conclusion

This study summarizes the main findings of the research that compares the impact of TT and SE on students' learning outcomes. Although TT continues to be widely used by PE teachers, students seem not to show increments in their learning when this teaching model is applied. In fact, when compared to a TT implementation, SE tends to achieve superior results in all the dimensions considered, namely personal and social skills, technical performance, game performance, sport specific content knowledge, and physical activity as well. Moreover, although SE shows a superior contribution to the development of personal and social skills, it does not prove to be inferior on its contribution to the motor and cognitive domains. This finding is aligned with the current requirements of democratic societies where students are more attracted to learning when they are invited to make decisions and solve problems autonomously. In fact, this trend seems to endow a greater students' commitment with learning, as well as a greater awareness of their difficulties and needs.

Finally, despite SE providing to be crucial in meeting the student's educational requirements, it is worthwhile to highlight that TT displays some benefits and therefore the idea that it must not be implemented needs to be clarified. Future research must prioritize the analysis of the teaching-learning process using alternative research methods and designs (i.e., experimental studies, qualitative data, longitudinal analysis, action-research, and case studies). Moreover, in order to extend our comprehension about the impact of the different models on students' learning outcomes longer units with an appropriate, well-conducted, and ongoingly evaluated planning in which models' fidelity are assessed, must be a concern in future investigations.

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Key points

- Comparisons among SE and TT tend to analyze team sports activities by sampling high-school students in co-educational classes via quasi-experimental designs.
- More than half of the studies that compares SE and TT were published over the past five years.
- Overall, the variables analyzed are related with the development of students' personal and social skills, as well as its motor and cognitive development.
- Although the results tend to point out increases in both SE and TT, superior achievements are observed when SE is implemented.
- Half of the studies did not establish the fidelity of the model implementation.
- Future studies should consider other methodological procedures and research designs, as well as longer units, in order to deep the understandings about the impact of the different models on students learning outcomes.

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