

## **Methods and models in the context of physical activity and physical education: strenght, weakness and gaps**

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### **Abstract**

Physical education and sports foster, amplify, and enrich opportunities for experiential learning, while also facilitating interaction and communication with others, enabling expression through diverse means of communication. These disciplines constitute an indispensable component within educational settings, allowing for interdisciplinary encounters in the realm of education. The instruction and acquisition of physical education within educational institutions present a formidable challenge in the contemporary era. Despite the exhaustive endeavors of researchers and scholars to examine the efficacy of diverse instructional methods, harmonizing educational objectives with pedagogical strategies remains a prominent area of investigation. Three fundamental conflicts with the traditional paradigm of multi-activity and sport technique-centered physical education have been identified, encompassing the inclusion of less-skilled students, the employment of brief learning sessions, and the pursuit of unattainable benefits for all student profiles. To tackle these concerns, various alternative pedagogical approaches have been explored and this article presents a comprehensive overview of the significance of physical activity and physical education in promoting a well-balanced lifestyle and enriching children's educational experiences. It assesses the efficacy of both traditional teacher-centered and innovative student-centered frameworks in physical education instruction and learning. The article delves into the challenges associated with aligning educational objectives with instructional strategies and provides an extensive survey of models-based practice approaches in physical education, encompassing Sport Education (SE), Cooperative Learning (CL), Teaching Games for Understanding (TGfU), and Teaching for Personal and Social Responsibility (TPSR). The potential advantages and limitations of these pedagogical models in enhancing students' physical education experiences are thoroughly examined, and suggestions for future research and implementation in this field are put forth. Despite the advantages of physical activity, recent studies reveal that a considerable majority of adolescents, particularly girls, fail to meet the recommended one-hour daily threshold of moderate to vigorous physical activity. The optimal duration of physical education classes and the teaching styles and methodologies employed therein can significantly influence their effectiveness in promoting physical activity.

**Keywords: experiential learning, educational settings, teaching, motor activities.**

### **Introduction**

Physical activity constitutes an indispensable constituent of a healthful way of life and bestows myriad advantages upon both bodily and psychological well-being (Rueggsegger and Booth, 2018; Burtscher and Burtscher, 2020). Within the scientific realm of physical activity (PA) investigation, researchers employ diverse methodologies and frameworks to assess, comprehend, and foster behaviors pertaining to physical activity. Nevertheless, it is imperative to discern the dissimilarity between the terms "method" and "model" within the context of PA. A method designates a specific technique or approach utilized to execute an exercise or physical activity. For instance, running, cycling, weightlifting, and yoga exemplify distinct methods of PA (Cereda, 2013; Iannetta et al., 2020).

On the other hand, a model refers to a theoretical structure or concept employed to explicate or comprehend physical activity. For instance, the Health Belief Model constitutes a theoretical model employed to elucidate the reasons behind individuals' engagement in health-related behaviors, including physical activity (Cereda, 2013; Jones et al., 2015). As stated by Hastie and Casey (2014), within the pedagogical domain, a model can be defined as a methodology for organizing the interconnected elements of curriculum, learning, and teaching with the objective of attaining specific learning outcomes. Sport Education (SE), Cooperative Learning (CL), Teaching Games for Understanding (TGfU), and Teaching for Personal and Social Responsibility (TPSR) represent some of the most widely recognized, employed, and scrutinized pedagogical models across the globe (Casey and Kirk, 2020). Comprehending the distinction between these terms is paramount for accurately assessing levels of physical activity and formulating efficacious interventions to encourage physical activity behavior. For instance, the World Health Organization (WHO, 2020) has established that elevated levels of physical activity (PA) and restricted sedentary time are crucial and advantageous for children and adolescents.

These practices have demonstrated positive effects on physiological aspects such as weight management and lipid profiles (Sugiyama et al., 2007), as well as the development of the musculoskeletal system and the prevention of cardiovascular ailments (Vasconcello et al., 2014). Additionally, they bestow social, mental, and cognitive benefits upon children (Saunders et al., 2016) and may also have enduring impacts on their lifestyles, potentially assisting them in maintaining healthy habits throughout adulthood (Tammelin et al., 2014).

Notwithstanding the established benefits of PA, recent studies and reports indicate that a significant majority of adolescents, especially girls (Sallis et al., 2016), fail to meet the recommended one-hour threshold of moderate to vigorous physical activity (MVPA) per day, with up to 80% falling short (WHO, 2020; Guthold et al., 2020; Tortella et al., 2021). Furthermore, they dedicate a substantial amount of time to sedentary activities, such as utilizing smartphones, tablets, or engaging in video games or television viewing (Biddle et al., 2010; Cereda & Vizzini, 2021). This trend seems to persist into adulthood, as evidenced by numerous international studies (US Department of Health and Human Service, 2018). These findings present a paradox considering the widespread availability of organized sports activities and the inclusion of physical education (PE) in educational curricula. PE, along with schools in general, are widely acknowledged as optimal settings for fostering healthy habits (Sevil-Serrano et al., 2020), as they exert a profound influence during children's formative years and lifestyles (Stoy et al., 2009). The time allocated to PE classes may serve as a pivotal determinant in meeting physical activity (PA) recommendations, as research suggests that effective time spent in PE classes can enhance PA levels by up to 50% (Hall Lopez et al., 2017; Bonilla et al., 2016). Hence, the quantity and quality of PA during PE classes act as critical indicators of the overall quality of the educational institution.

Nevertheless, despite frequent interventions in Physical Education (PE) classes and extracurricular activities, there appears to be an inadequate transfer of these efforts to the active behavior of young individuals during their leisure time (Sevil-Serrano et al., 2020; van de Kop et al., 2019). Moreover, the optimal duration of a PE class necessary to elicit positive physiological and behavioral changes remains unclear (Reed et al., 2013). It is noteworthy that the teaching styles and methodologies employed in PE classes can influence the effectiveness of these lessons. For example, a playful and more open approach to teaching may foster greater motor involvement compared to more prescriptive styles (Campos Mesa et al., 2011), although more pragmatic styles have been associated with enhanced academic performance (Serra-Olivares et al., 2017).

The levels of moderate-to-vigorous physical activity (MVPA) in PE classes can be influenced by various modifiable factors, such as the nature of the activities and their content (Zhou and Wang, 2019). For instance, Wang and Wang (2018) discovered that implementing the Teaching Games for Understanding (TGfU) approach led to increased MVPA levels in 9th and 10th-grade students compared to a traditional technique-based approach. Similarly, Perlman (2012) reported that unmotivated students exposed to the Sport Education Model (SEM) exhibited higher levels of physical activity compared to those in a skill-drill-game class (Perlman et al., 2012). Melero-Cañas et al. (2021) demonstrated that a hybrid educational program in PE classes, combining Teaching Personal and Social Responsibility with gamification techniques, resulted in improved levels of physical activity in schools.

Educational institutions are widely acknowledged as crucial settings for promoting physical activity (PA) and health, particularly through PE classes (Sallis and McKenzie, 1991; Kahan and McKenzie, 2015). Therefore, it is imperative to foster PA during PE classes and morning recess, especially among children with overweight or obesity, as they tend to engage in less physical activity across all daily segments, including school (Pope et al., 2020). The World Health Organization (WHO) recently recommended that children and adolescents aged 5-17 should engage in an average of 60 minutes per day of MVPA, including activities that strengthen muscles and bones, for at least 3 days per week (WHO, 2020). Additionally, Gao et al. (2011) observed that children with overweight or obesity participate in less MVPA during PE classes compared to their peers with a healthy weight. Boys generally exhibit higher levels of MVPA than girls, regardless of whether it is measured on weekdays or weekends (Aibar et al., 2014). However, some studies have not found significant gender differences in children (Svedenkrans et al., 2020) or adolescents (Manzano-Sánchez and Valero-Valenzuela, 2018).

It is noteworthy that there exists a propensity for physical activity (PA) levels to decline with the progression from childhood to adolescence (Arundell et al., 2013). The insufficiency of moderate-to-vigorous physical activity (MVPA) poses a particular concern for children's well-being, as sedentary behavior can have adverse effects on their health (Colley et al., 2013). Hence, it is imperative to assess physical fitness, sedentary time, and PA levels. While pedometers offer a cost-effective means of measuring PA in children and teenagers, they do not provide information regarding activity intensity, unlike accelerometry, which is deemed a reliable method (Pope et al., 2020). One of the primary objectives of physical education (PE) classes is to enhance factors that foster adherence to PA among children and teenagers. Model-based learning has demonstrated its capacity to augment motivation, autonomy, and competence, which exhibit positive correlations with MVPA (Manzano-Sánchez and Valero-Valenzuela, 2018). The Teaching Personal and Social Responsibility (TPSR) model has likewise been shown to enhance these factors (Martínez-Vizcaino and Sánchez-López, 2008; Manzano-Sánchez and Valero-Valenzuela, 2019; Manzano-Sánchez et al., 2019). Gamification interventions, implemented on a long-term basis within primary and secondary education across diverse social and educational contexts, have also proven effective in enhancing the efficacy of the TPSR model (Pérez-López et al., 2017a,b; Fernández-Río et al., 2020; Invernizzi et al., 2021).

### **The pedagogical model in physical education**

The instruction and learning of physical education in schools pose a significant challenge in the current era (MacPhail and Lawson, 2020; Ceciliani et al., 2021). Despite extensive efforts by researchers and scholars to investigate the effectiveness of different teaching methods, aligning educational objectives with instructional strategies remains a major topic of inquiry (Kirk, 2020). Three key conflicts with the conventional approach of multi-activity and sport technique-based physical education (Kirk, 2010) have been identified, including the integration of low-skilled students, the use of brief learning sessions, and the pursuit of unattainable benefits for all types of students (Casey and Kirk, 2020). To address these issues, various alternative pedagogical approaches have been explored.

Over the past thirty years, traditional teacher-centred methods have been replaced by innovative student-centred frameworks (Casey, 2014). Traditional curriculum models (Jewett, Bain, and Ennis, 1995) and instructional models (Metzler, 2005) have been superseded by models-based practice, which is based on pedagogical models (Haerens et al., 2011; Kirk, 2013) and provides alternative structures to enhance students' physical education experiences (Casey and Kirk, 2020).

SE was created to provide genuine and enriching sports experiences for boys and girls in the context of school physical education (Siedentop, 2002). The three primary objectives of SE are to foster competent, literate, and enthusiastic individuals, and it is achieved through six critical structural features: seasons, affiliation, formal competition, culminating events, record keeping, and festivity (Siedentop, Hastie, and Van Der Mars, 2020).

CL is based on the principle of learning with, by, and for each other (Dyson and Casey, 2016), and it emphasizes promoting five essential elements (Johnson, Johnson, and Holubec, 1994), namely interpersonal skills, processing, positive interdependence, promotive interaction, and individual accountability.

The primary aim of TGfU is to shift the focus from technique to the strategic considerations of game playing (Bunker and Thorpe, 1982), which is accomplished through modification, including representation and exaggeration (Mitchell, Oslin, and Griffin, 2013). The emphasis lies in situating learners within a game scenario where tactics, decision-making, and problem-solving are crucial aspects, while skill drills are also utilized to correct habits and reinforce abilities (González-Villora et al., 2021). The TGfU model encompasses six structural steps: game, game appreciation, tactical awareness, appropriate decision-making, skill execution, and performance. The original TGfU model has given rise to various frameworks worldwide, such as the Tactical Games Approach (TGA; Griffin, Mitchell, and Oslin, 1997), Game Sense (GS; den Duyn, 1997; Light, 2013), Play Practice (PP; Launder, 2001), Tactical-Decision Learning Model (T-DLM; Gréhaigne, Richard, and Griffin, 2005), or Developmental Games Stage Model (DGSM; Rink, 2002), all falling under the term Game-Centred Approach (GCA).

TPSR aims to instill in young individuals the development of personal and social responsibility through engagement in physical activities (Hellison, 2003). TPSR is structured around five responsibility goals, including respect for others, effort, self-direction, help, and transferability beyond the gym, as well as four major themes: integration, transfer, empowerment, and teacher-student relationships. Although each pedagogical model possesses its own unique characteristics, they share common concepts such as student-centered contexts and situated learning, facilitating a seamless transition into hybridization, as demonstrated by the SETPSR model (Fernandez-Rio and Menendez-Santurio, 2017). A systematic review revealed that multiple combinations of SE, TGfU, CL, and TPSR were employed in physical education, with elements of one model being present in the outcomes of others (González-Villora et al., 2019). For example, SE can promote the essential elements of CL, as demonstrated by Fernandez-Rio and Casey (2020).

### **Effective pedagogical approaches for physical education**

Over the past two decades, there has been a notable surge in research regarding pedagogical frameworks in the realm of physical education (Casey and Kirk, 2020). Numerous literature reviews have been conducted to evaluate the efficacy of various pedagogical models. Nevertheless, most of these reviews have predominantly concentrated on the implementation of individual models, such as SE (Bessa et al., 2019), TGfU (Harvey and Jarrett, 2014), CL (Casey and Goodyear, 2015), and TPSR (Pozo, Grao-Cruces, and Pérez-Ordás, 2018), with only one review exploring the hybridization of these models (González-Villora et al., 2019).

The findings indicated that SE has been the most extensively studied pedagogical model, with over 200 studies analyzed in seven literature reviews: Araújo, Mesquita, and Hastie (2014), Bessa et al. (2019), Chu and Zhang (2018), Evangelio et al. (2018), Hastie, Martínez de Ojeda, and Calderón (2011), Sierra-Díaz et al. (2019), and Wallhead and O'Sullivan (2005). Bessa et al.'s (2019) comprehensive review encompassed a wide range of positive learning outcomes, including responsibility, affiliation and ownership, inclusion, peer support and equity, teamwork, cooperation and compliance, autonomy, empathy and friendship, fair-play, empowerment, problem-solving and decision-making, leadership, trust and confidence, self-determination, and assertiveness. Other reviews delved into some of these outcomes in greater detail, such as Araújo, Mesquita, and Hastie (2014) and Evangelio et al. (2018), who focused on students' learning within the social, cognitive, and affective domains. Chu and Zhang (2018) and Sierra-Díaz et al. (2019) centered their reviews on psychosocial factors, such as students' motivation. Bessa et al. (2019) observed improvements in key variables related to learning in

physical education, including enjoyment, satisfaction, enthusiasm, and engagement, concerning students' personal and social development.

Similarly, Wallhead and O'Sullivan (2005) and Hastie, Martínez de Ojeda, and Calderón (2011) examined cooperation, empathy, and self-discipline, as well as attitudes (enthusiasm, enjoyment) and values (affinity, equity, culture) as variables. SE has the potential to promote positive cultural aspects of sport and physical activity, challenging the exclusionary discourses commonly present in institutionalized sport (Wallhead and O'Sullivan, 2005).

As for CL, the initial review conducted by Casey and Goodyear (2015) revealed improvements across the physical, cognitive, and social domains, while anecdotal reports suggested affective learning. However, the recent updated review on CL by Bores-García et al. (2021) did encompass the affective domain, with social learning being the most frequently evaluated. Dyson, Howley, and Wright (2021) took it a step further by focusing their review on social and emotional learning within CL, Fernández-Espínola et al. (2020) on intrinsic motivation, and Sierra-Díaz et al. (2019) on motivation. All these reviews affirmed the positive impact of CL on students' social and emotional learning.

Regarding the GCA, Harvey and Jarrett's (2014) preliminary analysis revealed advancements in proficiency development, strategic knowledge, game performance, physical fitness, personal and social maturation, and student dispositions. The analysis encompassed investigations on TGfU (24), GS (10), TGM (9), and PP (1), all of which exhibited positive impacts on the aforementioned outcomes. These findings were consistent with Miller's earlier evaluation (2015). A more recent comprehensive review conducted by Barba-Martín et al. (2020) on TGfU discovered that motor and cognitive learning, particularly decision-making and skill execution, were the most frequently assessed outcomes with positive effects. These results were corroborated by Abad et al. (2020). Furthermore, Sierra-Díaz et al. (2019) observed that CGA had a positive influence on students' motivation and psychosocial factors.

Likewise, the evaluation carried out by Pozo, Grao-Cruces, and Pérez-Ordás (2018) appraised TPSR implementation and revealed enhancements in students' values. Participants exhibited reductions in aggressive and disruptive behaviors, improvements in self-control, care, conflict resolution, responsibility, enjoyment, connection, empathy, self-confidence, self-esteem, self-efficacy, attendance, punctuality, grades, and their vision and motivation towards their academic and professional futures. Finally, Dyson, Howley, and Wright's (2020) review confirmed the positive outcomes associated with social and emotional learning linked to TPSR implementation.

A systematic review conducted by González-Villora et al. (2019) evaluated the hybridization of pedagogical models. The review identified various approaches to combining pedagogical models, such as SE-TGfU (seven studies), SE-TPSR (five studies), SE-SGA (four studies), SE-IGCM (two studies), and CL-TGfU (two studies). The review examined outcomes related to cognitive, social, motor, and affective learning. The findings suggested that the combination of pedagogical models extended the effects observed from implementing a single pedagogical model.

### **Exploring limitations of pedagogical models in physical education**

The reviews have identified numerous deficiencies that necessitate careful consideration when implementing pedagogical models. One of the principal shortcomings underscored by the majority of reviews pertains to the duration of interventions, with many of them being brief and inhibiting the progression of learning beyond an introductory stage, regardless of whether the implementation is based on CL, GCA, SE, or TPSR. Another weakness lies in the time required for skillful play, as the introduction of innovative approaches with intricate frameworks demands more administrative time, thereby impeding opportunities for motor skill practice and resulting in diminished practice time and potential adverse effects on learning. Additionally, both novice and experienced educators may encounter challenges in implementing pedagogical models due to their limited knowledge or experience. Prior training in the content, framework, or both is necessary for the successful execution of any pedagogical model. Furthermore, the support of a community of practice is imperative in facilitating the professional development of teachers.

The reviews of pedagogical models have identified several constraints that educators and scholars should carefully consider. One of these limitations pertains to the duration of interventions. Most reviews note that many interventions are too brief to allow learning to progress beyond an introductory level, regardless of whether the implementation is based on CL, GCA (Harvey and Jarrett, 2014), SE (Araújo, Mesquita, and Hastie, 2014), or TPSR (Pozo, Grao-Cruces, and Pérez-Ordás, 2018). Another limitation highlighted is the time required for skillful play. Implementing complex frameworks with innovative approaches, such as pedagogical models, demands more administrative time, detracting from time allocated to motor skill practice (Evangelio et al., 2018), which may result in reduced practice time and potential negative consequences on learning (Araújo, Mesquita, and Hastie, 2014). Novice and experienced teachers alike may encounter difficulties in implementing pedagogical models due to their limited knowledge or experience. Successful implementation of any pedagogical model necessitates prior training in the content, framework, or both (Barba-Martín et al., 2020), as well as the support of a community of practice (Harvey and Jarrett, 2014) to assist in teacher professional development (Casey and Goodyear, 2015; Hastie, Martínez de Ojeda, and Calderón, 2011).

Another limitation that has been identified pertains to the subpar performance of student-coaches in the implementation of Teaching Games for Understanding (TGfU). Harvey and Jarrett (2014) highlighted the potential for a negative transfer of tactical awareness and decision-making skills, resulting from errors committed by the coach during gameplay. In the case of SE, Araújo, Mesquita, and Hastie (2014) also acknowledged the possibility of issues in content development due to the transfer of content knowledge from the teacher to the student-coach, as well as challenges in the leadership skills of the student-coach during peer-teaching tasks. Consequently, it is imperative to closely monitor the role of the student-coach/teacher in physical education. Furthermore, maintaining fidelity to the SE model emerged as a delicate matter, as some teachers opt to implement modified versions of SE, such as complete, "diluted," or "à la carte" approaches (Curtner-Smith, Hastie, and Kinchin, 2008). The implementation of CL is also subject to scrutiny, as numerous studies lack comprehensive details regarding the framework employed (Bores-García et al., 2021). This complexity is further compounded in the case of hybridizations (Evangelio et al., 2018), which involve the integration of multiple elements, making it increasingly challenging to ensure the proper incorporation of each one.

### **Developing a research agenda for pedagogical models in PE**

Numerous critical analyses have highlighted the limited utilization and investigation of pedagogical models concerning individuals with exceptional educational requirements. Harvey and Jarrett (2014) and Bessa et al. (2019) have indicated the absence of this population in the literature pertaining to the discussion of Generalized Coordinated Abilities (GCA) and Special Education (SE) within educational and sports club environments. Merely one study has concentrated on SE in this particular population (Fernandez-Rio and Menendez-Santurio, 2017), and TPSR stands as the singular pedagogical model that addresses at-risk youth (Dyson, Howley, and Wright, 2020), who can be classified as having special needs concerning education and relationships. Consequently, there remains a significant void that necessitates attention. Moreover, two deficiencies have been identified within the pedagogical models of SE and GCA, specifically relating to girls and children with limited skills. Evaluations of SE have revealed certain implementations favoring highly skilled boys (Araújo, Mesquita, and Hastie, 2014), while others have discovered that girls attain higher levels of achievement (Evangelio et al., 2018). Some studies have even suggested that SE may perpetuate gender stereotypes, thereby granting boys an advantage (Wallhead and O'Sullivan, 2005).

The findings within the existing literature on pedagogical models have proven inconclusive and contradictory, particularly concerning matters of gender and skill level. To address this void, future research should strive to regulate student participation, ensuring equitable involvement in pedagogical models such as SE and GCA, as emphasized by prior investigations (Harvey and Jarrett, 2014; Araújo, Mesquita, and Hastie, 2014). Additionally, it is imperative to explore the dynamics of peer-teaching tasks to prevent inadequate performance by student-coaches. Another avenue for future research lies in examining the representation of bodily expression and individual sports, which have been underrepresented in the literature, given the disproportionate focus on team sports. Lastly, comprehending how contextual factors within schools impact teachers' utilization of a model after the initial implementation, as well as determining the sustainability of the benefits obtained over time, is essential.

### **Discussions**

Which pedagogical models have undergone systematic review? SE, CL, CGA, TPSR, and hybridizations have been examined comprehensively, with SE receiving the greatest degree of scrutiny. It has gained immense popularity on a global scale due to its successful adaptation across diverse contexts, possibly because of its focus on sport-related content, which remains highly favored in the field of physical education. CL and GCA have also been widely implemented. CL, with its longstanding tradition in education, has garnered increasing recognition in physical education over the past four decades, likely owing to its emphasis on social and emotional learning. GCA, akin to SE, concentrates on sport content and has evolved into numerous variations worldwide, significantly expanding its influence. TPSR, on the other hand, has received comparatively less research attention, likely due to its initial development in extracurricular settings before transitioning to physical education. Nonetheless, its positive outcomes have generated growing interest among scholars and practitioners regarding its implementation within educational contexts. Lastly, while the hybridization of pedagogical models may not be as prevalent as the adoption of single models, it is gradually gaining traction in the field of physical education.

The findings revealed significant effectiveness across the various pedagogical models. SE, being the most widely adopted, has been found to enhance students' game performance, tactical knowledge, skill development, empathy, assertiveness, fair play, enthusiasm, enjoyment, and motivation (Araújo, Mesquita, and Hastie, 2014; Bessa et al., 2019; Evangelio et al., 2018; Hastie, Martínez de Ojeda, and Calderón, 2011; Sierra-Díaz et al., 2019; Wallhead and O'Sullivan, 2005). The advancements in competence, autonomy, and relatedness align with the theoretical underpinnings of the SE model, which aim to cultivate sport-specific skills and strategic knowledge, foster responsible leadership, promote effective teamwork, and enable informed decision-making regarding sport-related matters (Siedentop, Hastie, and Van Der Mars, 2020). Furthermore, these

objectives have been accomplished across a variety of contexts and content areas (Bessa et al., 2019). Hence, SE stands as a reliable pedagogical model that teachers can employ to achieve the desired outcomes.

Two systematic reviews in the field of physical education (Bores-García et al., 2021; Casey and Goodyear, 2015) have elucidated the efficacy of Cooperative Learning (CL) in enhancing students' performance across all domains of learning. Motor, social, physical, cognitive, and affective benefits have been extensively documented (Altinkok, 2017; Darnis and Lafont, 2015; Dyson, Colby, and Barrat, 2016; Fernandez-Rio et al., 2017; Goodyear, Casey, and Kirk, 2014; O'Leary et al., 2015; Wallhead and Dyson, 2017). Various classroom goal structures have been identified, including individualistic, competitive, and cooperative learning (Johnson and Johnson, 2017). Within cooperative learning contexts, students collaborate harmoniously towards shared objectives, fostering favorable outcomes within physical education settings. Despite the predominant approach of multi-activity and sport technique-based instruction in physical education (Kirk, 2010), the reviews demonstrate that CL holds a valuable position within the physical education classroom and has the potential to enrich students' learning across all four domains.

Furthermore, Dyson, Howley, and Wright (2021) ascertained that CL effectively promotes social and emotional learning variables, such as students' empathy, compassion, and tolerance. The significance of social and emotional learning has notably surged within the field of education (Barlett, 2019), as it equips individuals with essential skills for success in diverse social contexts, including school, work, and sports (Jones et al., 2017). This review has unveiled that CL can provide the requisite environment to nurture these skills, such as empathy and tolerance, through its five pivotal elements (Johnson, Johnson, and Holubec, 1994): interpersonal skills, processing, positive interdependence, promotive interaction, and individual accountability.

On the contrary, the diverse frameworks encompassed within the CGA (TGfU, GS, TGM, and PP) have demonstrated a favorable influence on students' acquisition of abilities, strategic understanding, game performance, physical fitness, attitudes, motivation, as well as their personal and social growth (Barba-Martín et al., 2020; Harvey and Jarrett, 2014; Sierra-Díaz et al., 2019). The utilization of modified games that incorporate representation and exaggeration, along with a focus on tactical awareness, game appreciation, decision-making abilities, and skill execution, constitute pivotal elements that can augment student performance and yield the aforementioned positive outcomes (González-Villora et al., 2021; Mitchell, Oslin, and Griffin, 2013). Furthermore, the CGA has placed significant emphasis on personal and social development (Barba-Martín et al., 2020), acknowledging that the social and interactive aspects of gameplay profoundly influence interpersonal relationships among participants, ultimately impacting students' learning within these realms (Harvey and Jarrett, 2014). Therefore, the frameworks offered by the CGA present educators with an opportunity to address all facets of learning, provided that they are implemented judiciously (as substantiated by the earlier mentioned weaknesses and subsequent discussions).

Likewise, an extensive body of evidence supports TPSR as an exemplary framework for fostering students' values (Poza, Grao-Cruces, and Pérez-Ordás, 2018), showcasing a strong correlation with their social and emotional development (Dyson, Howley, and Wright, 2021). The implementation of TPSR has revealed the benefits highlighted by Hellison (2011) when the model was introduced in extracurricular contexts. At its core, the model's quintessential feature—the five responsibility goals (respect for the rights and sentiments of others, self-motivation, self-direction, caring, and transfer)—aims to address students' social and emotional growth. Furthermore, the model endeavors to empower students by shifting responsibility from the teacher to the students themselves and incorporating accountability into physical activity practices (Hellison, 2003). These collective attributes render TPSR an ideal framework for fostering positive outcomes in students.

In recent years, there has been a growing interest in hybridizing different pedagogical models. Research supports the idea that the working structures defined in isolated models can be combined to enhance the effectiveness of physical education (González-Villora et al., 2019; Colella & D'Arando, 2021). A general overview of the effectiveness of pedagogical models in physical education indicates that these structures maintain a solid connection with quality physical education, including personal and social development and motor skills learning. Hybridizations reinforce the joint impact of the combinations implemented, since pedagogical models share several features (Barker, Quennerstedt, and Annerstedt, 2015; Harvey, Pill, and Almond, 2018; Joyce, Weil, and Calhoun, 2015; Ní Chróinín and Cosgrave, 2013): learn-to-learn competency (helping students transfer knowledge to other contexts), constructivist approach (allowing students to build their own knowledge with the help of others), scaffolded learning process (using progressions to learn), ongoing formative assessment (helping students monitor their progress), collaborative skills (encouraging students to work in small groups), global awareness (developing physical literacy), and promoting creativity (encouraging divergent thinking). All of these features can help hybridizations achieve the outcomes uncovered.

Which weaknesses have been identified? The scientific literature exhibits a bias towards studies with positive outcomes, leading to publication bias, which can pose a particular quandary in systematic reviews (Lin and Chu, 2018). Nevertheless, the results have unveiled certain issues that necessitate careful consideration in order to effectively implement any pedagogical model. The duration of the intervention emerged as a focal point in various reviews (Bores-García et al., 2021; Casey and Goodyear, 2015), as positive impacts such as cooperation stemming from a pedagogical model (SE) may wane over time (Fernandez-Rio and Casey, 2020). All the reviews recommended extended time periods to allow for learning to progress beyond an introductory

stage. Undoubtedly, implementing pedagogical models poses challenges for teachers, particularly for preservice and novice teachers (Silva, Farias, and Mesquita, 2021), as they entail novel and intricate frameworks that are arduous to master. Teachers often encounter obstacles in their attempts to implement these models, frequently experiencing frustration due to slower-than-expected progress (Casey and MacPhail, 2018).

Casey et al. (2021) drew attention to the incongruity that often arises between the aspiration (in the case of a model) and the actual implementation (in this instance, a practice). Educators may encounter literature extolling the advantages of implementing pedagogical models (aspiration), yet remain oblivious to the obstacles they might encounter (actual implementation), leading to frustration. One such hurdle is the substantial amount of time devoted to administrative tasks, leaving limited room for students to engage in proficient play. In order to prevent this from adversely affecting student learning, instructors must make adjustments to specific elements, such as the information contained within the group's portfolio. Moreover, the inclusion of roles such as student-coaches has been identified as crucial, as students' learning often relies on their peers, and some individuals may not be adequately prepared to fulfill the role. To assist students in carrying out their responsibilities effectively, teachers should offer support, such as learning prompts or individualized feedback. Lastly, the process of hybridizing pedagogical models is no easy feat, as numerous factors must be taken into account, rendering the integration of all elements challenging (González-Villora et al., 2019). Consequently, when implementing pedagogical models, teachers should seek guidance, particularly when endeavoring to amalgamate them.

To tackle the obstacles faced by educators, communities of practice (Harvey and Jarrett, 2014) can prove invaluable for professional development (Hastie, Martínez de Ojeda, and Calderón, 2011), rendering matters more manageable. However, it is no simple task for researchers to adhere strictly to precise guidelines for designing interventions that remain faithful to the original model (Hastie and Casey, 2014), and on occasion, the context may not support model fidelity, presenting a formidable challenge. Nevertheless, there is no doubt that pedagogical models offer teachers a diverse array of evidence-based options to suit their specific educational settings (Baker, 2016; Casey, 2017). Furthermore, as posited by Casey et al. (2021), pedagogical models should not be perceived as a "finished framework," as they necessitate ongoing evolution through collaboration between researchers and educators, acknowledging weaknesses such as those revealed in this comprehensive review and providing viable solutions. Consequently, pedagogical models should serve as a conduit connecting future teachers, practicing teachers, and teacher educators (Lawson, Kirk, and MacPhail, 2020) for the advancement of physical education and the benefit of the students.

The findings unveiled certain discrepancies. There remain several avenues of inquiry that warrant attention. Primarily, the exploration of the association between individuals with special educational needs and various pedagogical models has been scant. Only one study has been conducted, yielding positive outcomes (Fernandez-Rio and Menendez-Santurio, 2017). As classrooms grow increasingly diverse, pedagogical models can be tailored to accommodate these students' requirements (Kirk, 2020). Students with special needs encompass those with behavioral, communication, intellectual, or physical exceptionalities, either individually or in combination (Ontario Ministry of Education, 2000). Consequently, some of these students face limited opportunities for movement and physical activity, others lack confidence in their abilities, while others struggle with self-regulation. Pedagogical models can address these concerns by maximizing practice time through small group work (CL), fostering confidence through small-sided games (GCA), and fostering self-directed skills through individual goal setting (TPSR).

Research findings on girls and low-skilled children have yielded conflicting results, with some studies indicating no disparities while others report differences (Araújo, Mesquita, and Hastie, 2014; Evangelio et al., 2018). While teachers acknowledge the benefits of implementing pedagogical models (hope), they may be unaware of potential challenges they may encounter (happening) or fail to consider the needs of girls and low-skilled children when teaching sports. For example, the GCA approach suggests that these students could benefit from engaging in small-sided games or modified rules that provide increased opportunities for success and learning. Further research is needed to clarify this issue and provide scientifically sound information to enhance pedagogical models. These gaps may be attributed to the dynamics of peer-teaching tasks, which could elucidate why certain students do not reap the same advantages.

The crux of student-centered pedagogies resides in this matter, demanding meticulous deliberation to ensure favorable results. As previously deliberated, educators should furnish assistance in the form of instructional prompts, tailored training, or personalized feedback to facilitate students' engagement in peer-teaching tasks across various pedagogical frameworks. It is imperative to note that the notion of less skilled students should extend beyond athletic proficiency to encompass a wide array of aptitudes. Consequently, research on pedagogical models should expand its scope to encompass all types of abilities, including physical, rhythmic, and expressive proficiencies.

Furthermore, there has been a dearth of emphasis on corporeal expression and individual sports during the implementation of pedagogical models, which possess adaptability to diverse contexts and contents. To foster a healthful lifestyle, students ought to be exposed to a broad spectrum of subject matter (Haerens et al., 2011). Conversely, certain scholars have voiced concerns regarding the post-implementation phase of pedagogical models (Casey and Goodyear, 2015). Educators may encounter frustration when implementing these models, as progress may not unfold as swiftly as anticipated (Casey and MacPhail, 2018). Once the initial unit is

concluded, many teachers may revert to conventional pedagogical approaches that offer them a greater sense of comfort (Goodyear and Casey, 2015), potentially resulting in diminished learning outcomes over time. Consequently, future research must address the sustainability of changes engendered by pedagogical models, particularly in instances where educators revert to more traditional teaching methods or when the novelty of the pedagogical framework wanes. This quandary remains a formidable challenge for both researchers and practitioners, given the importance of instigating enduring effects across all four domains of student learning beyond the initial impact.

Moreover, the amalgamation of pedagogical frameworks encounters comparable gaps and limitations to individual pedagogical models, yet with the added challenge of being a relatively nascent and unfamiliar approach. Certain educators may be inclined to embrace hybridization without fully grasping its intricacies or efficacy, resulting in a superficial and trend-driven implementation. Hence, further research is imperative to delve into the complexities of this approach comprehensively and assess its impact on students' learning outcomes.

This undertaking presents a comprehensive synopsis of the current comprehension of pedagogical models in the realm of physical education. The featured evaluations range from moderate to high quality. However, the scarcity of meta-analyses in most studies, owing to the heterogeneity in intervention duration, imposes limitations on the paper's scope. To facilitate future meta-analyses, a standardized temporal framework is essential, although attaining such uniformity in educational settings may prove challenging.

### Conclusions

The pedagogical models SE, CL, CGA, TPSR, and hybridizations have demonstrated effectiveness in enhancing students' learning and development across various domains. SE has received the most attention and has shown promising results in promoting sport-specific skills, leadership, and responsible decision-making. CL has a long-standing tradition in education and has gained popularity in physical education due to its emphasis on social and emotional learning. CGA emphasizes the development of skills, tactical knowledge, and personal and social development through modified gameplay. TPSR focuses on promoting students' values and social and emotional development through its five responsibility goals. Hybridizations of different pedagogical models have shown potential in enhancing the effectiveness of physical education. However, the duration of interventions, challenges in implementation, and the need to evolve with the assistance of researchers and teachers are critical factors to consider. Therefore, continued research and collaboration among researchers, teachers, and teacher educators are necessary to ensure the successful implementation of pedagogical models in physical education and the fulfillment of their potential in promoting student learning and development.

There are still gaps in research regarding the implementation of pedagogical models in physical education, particularly in relation to special educational needs, girls and low-skilled children, and the sustainability of the changes produced by these models over time. Teachers must provide assistance to aid students in performing peer-teaching tasks, and the concept of low-skilled children should not be limited only to sports skills but should encompass all types of skills. There is a lack of emphasis on body expression and individual sports in implementing pedagogical models, which should be adapted to any context and any content to promote a healthy lifestyle. Hybridization of pedagogical models is a relatively new and unfamiliar approach, and more research is needed to fully explore its intricacies and impact on student learning outcomes. A standard temporal framework is needed to facilitate future meta-analyses, although this may be challenging to achieve in educational settings.

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