A Novice Teacher as Facilitator of Learning During a Hybrid Sport Education/Step-Game Approach Volleyball Season

Rita M. R. da Silva ✉**, Cláudio F. G. Farias, Ana G. A. Ramos and Isabel M. R. Mesquita**
CIFI2D, Faculty of Sport, University of Porto, Porto, Portugal

Abstract

This study aimed to examine how a novice Physical Education teacher unfolded her pedagogical practice as a facilitator of learning during a hybrid Sport Education/Step-Game-Approach volleyball season; and to investigate students' perceptions about their lived learning experiences and active involvement in building their own learning process. For this purpose, an insider action-research design was implemented throughout one school term (20 lessons of 45 minutes each in total). Twenty-five students (aged between16 and17 years old), enrolled in the 12th grade at a Portuguese high school took part in this investigation. The novice teacher, who held two years of professional experience, assumed the dual role of teacher-researcher, facilitating an in-depth understanding of the complexity featuring of the teaching-learning process. Qualitative data were collected using multiple data sources (i.e., teacher's lesson plans and field diary, and student's focus-group interviews), and analyzed using a hybrid approach of inductive and deductive thematic analysis. The results revealed that the use of this hybrid season helped the teacher to act as facilitator of learning, namely by: (i) using two student-centered models with unique internal structures and functionalities, (ii) increasing the level of responsibility taken by students for their own learning experiences, (iii) adapting the lesson plans to students' individual needs, and (iv) combining a more supportive intervention with the use of more indirect teaching strategies. Together, these strategies seemed to prompt students' autonomy and sense of active control of the class activities, the development of students' abilities and volleyball-based knowledge, leading them to be more interested and engaged in Physical Education. In conclusion, the alliance between the student-centered environment (Sport Education) and the specificity of the content subject-knowledge (Step-Game Approach for non-invasion games) seems to have allow the novice teacher to adjust her pedagogical intervention as facilitator of learning to students' individual learning needs.

Key words: Student-centered models, volleyball, physical education, high school, action-research, qualitative analysis.

Introduction

To connect students with personal and cultural representations of sport and feeding them with genuine enjoyment through a collaborative participation (Farias et al., 2020), the teaching and learning of sports in Physical Education (PE) has been a "hot topic" over the last decades (Hastie and Mesquita, 2016). Nonetheless, the experience of participation in sports has been oftentimes perceived by students as a boring content (Casey et al., 2014) which reflects their dissatisfaction. This perception is based on the lack of adjustment of teacher's instructional interventions according to students' individual learning needs (Silva et al., 2021a) and the predominant teaching of isolated technical

skills focused on molecular, prescriptive and uncontextualized solutions (Kirk, 2010).

To deal with this issue, research has shown the importance of engaging students in student-centered and game-based approaches. The latter places students at the center of teaching–learning processes and involve an extensive participation of students in modified game-forms according to their abilities (Hastie and Mesquita, 2016).

Sport Education (SE) (Siedentop, 1994) is acknowledged as one of these student-centered models, in which a primary concern is the promotion of a democratic and inclusive pedagogy in PE lessons. To achieve this goal, this model includes formal competition events, in which the students perform multiple roles (e.g., coaches, referees, score keepers, statisticians), and are affiliated in teams (Siedentop, 1994). Through persistent teamwork, students are invited to practice together, supporting each other, and making teammates accountable for their own learning process (Araújo et al., 2015). Bessa et al. (2019) reported that students feel that the specific features of SE can generate high enthusiasm and engagement in sport activities.

However, despite the widespread acknowledgment of SE educational benefits, the model places less emphasis on how tasks can be specifically modified and does not offer an explicit game framework on how to develop tactical and technical content progressions (e.g., by level of increasing complexity). Therefore, SE has been increasingly combined with game-based approaches (e.g., SE-Teaching Games for Understanding, Gil-Arias et al., 2021; SE-Invasion Games Competence Model, Farias et al., 2020), which allows the optimization of the teaching-learning processes. This results in an 'inward' focus on the sport-based content-development and instruction (Araújo et al., 2019).

The Step-Game Approach (SGA) (Mesquita et al., 2005) is a student-centered model that specifically considers the nature of non-invasive games, like volleyball. This constructivist approach advocates the development of students' game play ability through step-by-step challenges, establishing meaningful couplings between tactical demands and technical skills (Mesquita et al., 2005). SGA is grounded in problem-based and tactical-focused activities of Teaching Games for Understanding (Bunker and Thorpe, 1982), as well as upon the Rink's (1993) Skill Development Approach. SGA presents an explicit structure for teaching volleyball, encompassing a progression of tasks that extends beyond the 'generic' practice tasks of Teaching Games for Understanding toward implementing (i) acquisition tasks, that emphasize the development of a specific technical skill, (ii) structuring tasks, which focus on understanding the tactical and technical skills of the

game but without opposition, and (iii) adaptation tasks, in which the goal, action structure and main tactical features, are identical to the full volleyball game (Mesquita et al., 2005).

The combination of SE and SGA has the potential to achieve the affective and social goals of student participation highlighted in SE (where equity and inclusion are key educational banners) and also to consider the "specialized" learning of the tactical content taught. Further, through the use of different learning stages that respect, at each time, the tactical understanding and skill level of students, it is possible to individualize learning goals and design meaningful learning scenarios (Mesquita et al., 2005). SGA defines four volleyball learning stages, from 1 (1x1) to 4 (4x4), in which the game-forms progressions build-up aligned both with the formal and specific functional structure of volleyball as with the level of tactical understanding and skills progressively exhibited by students at different points in their game-play development (Chêne et al., 1986).

The growing body of research undertaken on this hybrid combination has clarified and proved its significance to teaching and learning games in PE (see, for example, Araújo et al., 2015, 2017). However, these models imply that teachers act as facilitators of learning, by simplifying or challenging learning scenarios based on students' needs (Dyson et al., 2004). This is a very demanding process for novice PE teachers (NTs). Additionally, as recently reported by Silva and colleagues (2021b), the implementation of student-centered models that concomitantly sought to promote an active involvement of students, for instance by building their own learning experiences, can also be a challenging task for inexperienced teachers.

In this sense, despite the wide recognition that the effective performance of the facilitator's role requires the mastery of complex pedagogical skills (Farias et al., 2018), up to date investigations on this topic remain scarce. Thereby, it is imperative for researchers to conduct studies focused on examining the challenges felt by teachers and the strategies used to perform such role.

In this respect, most of the studies conducted so far typically include experienced PE teachers rather than examining the pedagogical implementation of student-centered models by NTs (Silva et al., 2021b). The limited research with NTs shows that they maintained tight control of the lessons using reproductive teaching styles and low-order questioning (O'Leary, 2014). Doing so, NTs frequently narrow the tactical complexity of games to the teaching of drills-skills isolated from the game context that provides them with meaning (O'Leary, 2014). Currently, there are no studies on the implementation of SE-SGA hybrid seasons.

Investigating NTs' teaching practices is particularly important and can be extremely insightful given the rich information drawn from their lived experiences, skills, and conceptions. Moreover, it can provide useful information for future pedagogical practices of many other practitioners who will shape their behaviors as teachers at an early stage of their career (Silva et al., 2021b).

Regarding to the engagement of students in leading their own learning process, some studies suggest that students did not adopt an active participation in PE lessons due to their unfamiliarity with the roles that they can perform (McMahon and MacPhail, 2007). Furthermore, there is a marked lack of examination of students' voices about their lived learning experiences during participation in student-centered PE lessons. In fact, this is a crucial topic of study, as students are recognized as key agents in co-creating their learning environments and improving their experiences of schooling (Oliver and Kirk, 2015). In this sense, qualitative research is as an appropriate methodology to access in depth perceptions of students on lived experiences and to understand the features that support students' behavior (e.g., commitment, active learning) (Phillips et al., 2021). Given its cyclical and interventive nature which is supported by an ongoing data collection and analysis, action-research designs could be extremely useful to granted teachers the opportunity to improve their teaching effectiveness through responsive planning, acting, finding, and re-planning (Kemmis et al., 2014).

Given the presented rationale, the purpose of this study was twofold. First, we sought to examine how a novice PE teacher unfolded her pedagogical practice as a facilitator of learning during a hybrid SE-SGA volleyball unit. Second, we investigated how students perceived their own learning experiences in terms of active participation in the development of such experiences.

Methods

Design
This study adopted an insider action-research (AR) design, where the teacher assumed the dual role of teacher-researcher (Koekoek et al., 2019). An insider-AR design reflects an epistemology capable of providing a privileged and deep viewpoint about the teaching-learning process (Coghlan, 2007), keeping pace with the dynamic and situated development of teaching and learning within student-centered models (Farias et al., 2018).
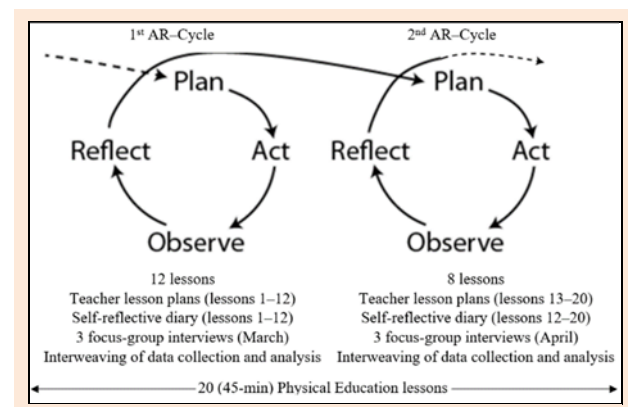

Figure 1. Action-research timeline.

The present study involved two AR-cycles with each one including the processes of planning, acting, observing, and reflecting on practice (Kemmis et al., 2014) (Figure 1). All pedagogical processes were centered on the events emerging during the implementation of the SE-SGA teaching program. The 1st AR-cycle corresponded to the diagnosis phase. Here, students were assessed on their sport ability, grouped by learning stages, and affiliated into

persistent teams in which they co-construct learning tasks. At the end of the 1st AR-cycle, reflections of the NT and students, as well as fact-finding about the teaching-learning process, worked as action steps to plan the 2nd AR-cycle. Aligned with the study's purpose, the 2nd AR-cycle focused on empowering students to take more responsibility for, and control of their own learning experiences.

Participants

This study included 25 students as participants (aged between16 and17 years old) who were enrolled in the 12th grade at a Portuguese high school. The students had already previous volleyball experience in PE lessons; however, none of them was involved in extra-curricular volleyball activities (e.g., athletes in volleyball clubs). The students had also previous experience with SE (in the first school-term and taught by the same NT) but were not familiar with SGA. The female NT (25 years-old) had two years of teaching experience, one-year as a pre-service teacher and another as a PE teacher at a different school. This research allowed the NT to consolidate the previous experiences gained during her master's degree (Physical Education Teaching in Basic and Secondary Education) in which she explored specifically the practical implementation of student-centered models. Currently, the NT is also a PhD student in the Sports Science Doctoral Program. The second and fourth authors (experts in the use of student-centered models), were partners in this paper, acting as advisors and peer-debriefs to challenge the NT interpretations throughout her teaching-learning process. The study followed the guidelines stated in the Declaration of Helsinki and was approved by the Institutional Research Ethics Committee of the authors' institution (CEFADE 18 2019). Students and their legal guardians were informed about the research scope and they signed informed consent. Confidentiality and anonymity issues were explained and ensured using pseudonymous.

The Sport Education/Step-Game Approach season

As recommended by Siedentop (1994) the SE-SGA season lasted a full school term (from January to April 2018) and was applied during 20 PE lessons and 45-min each one. The season followed all the key-features of SE (i.e., seasons, persisting teams, formal competition, record keeping, festivity and a culminating event) (Siedentop, 1994). Concurrently, the learning tasks followed the instructional framework of SGA comprising acquisition, structuring, and adaptation instructional tasks for each learning stage (Mesquita et al., 2005). Table 1 provides a complete outline of the season planning, displays the learning goals for each learning stage, and includes the main students' roles performed at each PE lesson. For an easier reading of the Table, please see the example given from lesson 5-6 at the end of Table 1.

SE features

Considering the diagnosis assessment initially performed by the NT and the contextual conditions (i.e., sports hall available and number of students), students were allocated into two different learning stages (learning stage 2: 2vs2; and learning stage 4: 4vs4). Within each learning stage,

however, students had different skill levels in technical and/or tactical domains. To exemplify, in an intra-group analysis, a total of twelve students from the learning stage 4 could integrate six students with higher technical and tactical skills when compared the other six students from the same learning stage. Thereby, students were grouped into mixed ability-teams per learning stage. Following the previously example, it means that three teams, formed by four students each, included two higher-skilled students, and two lower-skilled students (all of them belonging to the learning stage 4). Noteworthy, the teams from the same learning stage shared common game-play issues. In total, eight mix-ability teams, five teams of learning stage 2 and three teams of learning stage 4, constituted the class. This arrangement provided an ideal context for encouraging students to participate in peer-teaching interactions alongside students within the same learning stage. The teacher gradually transferred instructional leadership responsibility to students. Thus, progressively students began to (i) select learning tasks, which they deemed appropriate for improving their team's performance, (ii) leading instruction during peer-assisted tasks, (iii) assuming the warm-up tasks, and (iv) managing the tournaments.

The season was divided into two phases: (i) in the first one, students learned the specific technical and tactical skills of volleyball through team practice activities and informal practice matches; and (ii) in the second phase, students were engaged in two formal competitions. In the first competition, called 'graded competition', they played against classmates from their learning stage (i.e., students from learning stage 2 compete with each other in 2vs2 game-form, and students from learning stage 4 in 4vs4 game-form). In the second competition, students were mixed up (i.e., students from both learning stages work and compete together in 2vs2 and 4vs4 game forms). A culminating event was organized in the last lesson of the season and students were awarded (i.e., extra points) for their fair-play behaviors.

SGA features

As recommended by Mesquita et al. (2005), a 2v2 game-form was used to diagnose students' skill level. The main goal of the learning stage 2 was to develop students' competence during cooperative games between teammates and competition moments against other opponent teams during the 2vs2 game. Four main tactical skills were taught in this stage: (i) verbal communication; (ii) assigning accountability zones; (iii) watching the opponents' placement; and (iv) playing the ball to the vulnerable place of the opponent's court. In addition, three technical skills were taught: (i) the overhead pass; (ii) the forearm pass; and (iii) the underhand serve. Although the overall 2v2 game format was retained, the game rules and the learning tasks were ongoingly modified to match the students' learning needs. For example, low-skilled students were allowed to catch the ball on the first contact, or to perform a double contact. These rules were not applied to high-skilled students.

The main goal of learning stage 4 (where some goals of stage 3 - 3v3 - where adopted) was to increase the number of tactical options in offensive organization (three attackers instead of one) and develop defensive

organization during counterattacking (1:2:1 'mobile square' was adopted). Four main tactical skills were taught in this stage: (i) to link two actions, like receiving and attacking the ball; (ii) to adjust displacements according to ball trajectories; (iii) to identify the space where the student will set and attack the ball; and (iv) to distinguish back defense position according to the space occupied by the blocker. In addition, three technical skills were taught, namely, spike, block, and overhead serve.

Table 1. Overview of the hybrid SE/SGA season.

Lessons	Season planning
	1st AR-cycle
1-2	Diagnostic assessment (2vs2); Allocation of teams according to their LS; Volleyball quiz – questions about rules.

		Learning stage 2	**Learning stage 4**
First phase: team practice activities and informal practice matches	**3-4**	Within-team practice: Overhead and forearm pass; Receiver/non-receiver notion (0:2) with the inclusion of verbal communication; 2vs2.	Within-team practice: Overhead pass, forearm pass and service (underhand and overhead); Students' positions in serve-reception scenario (1:3); 4vs4.
	5-6	Within-team practice: Overhead pass, forearm pass and underhand serve; "short-long" (anteroposterior displacements) with overhead and forearm pass; receiver/non-receiver notion (0:2), with the inclusion of verbal communication; 2vs2; Students' roles: design an exercise to solve an identified problem - lack of verbal communication between the two students and consequent assigning accountability zones.	Within-team practice: Overhead pass, forearm pass and spike; "whoever attacks, set" (chain two actions, receiving and attacking the ball); 4vs4; Students' roles: design an exercise to solve an identified problem - shooting difficulties due to technical problems in the distributor's action.
	7-8	Within-team practice: Anteroposterior and lateral displacements; Overhead pass, forearm pass; Receiver/non-receiver notion (0:2) with the promotion of communication and assignment of accountability zones; 2vs2. Students' roles: implement the learning tasks created to solve the problems identified in the previous lesson.	Within-team practice: Anteroposterior and lateral displacements; chain the distributor's action (first contact) with the attacker's (third contact); adjust movements to ball trajectories; 4vs4.
	9-10	Within-team practice: Lateral displacements; Overhead pass, forearm pass and underhand serve; watching the opponents' placement and playing the ball to the vulnerable space of the opponent's court; 2vs2; Students' roles: design an exercise to solve an identified problem - lack of reading the opponent's behavior.	Within-team practice: Lateral displacements; Overhead pass, spike and block; Rotation of 'mobile square' in defense situation (1:2:1): to identify the space where the student is going to attack the ball and to distinguish back defense placement according to block action; 4vs4; Students' roles: design an exercise to solve an identified problem - Placement of the ball in spaces already occupied.
	11-12	Within-team practice; Students' roles: implementing the learning tasks built to solve the game-problems previously identified.	
		Focus group sessions	
		2nd AR-cycle	
	13-14	Within-team practice; Students' roles: implementing the learning tasks built to solve the game-problems previously identified; prepare a proposal for the constitution of teams for the mix-competition; team captain.	
Second phase: formal competition	**15-16**	Formal competition (graded competition, 2vs2; and mix-competition);	Formal competition (graded competition, 4vs4; and mix-competition);
		Students' roles: referee, team captain, score, records keeper, manage one tournament-day; peer-teaching (coaching roles); and lead the warm-up.	
	17-18	Formal competition (graded competition, 2vs2; and mix-competition);	Formal competition (graded competition, 4vs4; and mix-competition);
		Students' roles: referee, team captain, score; records keeper; lead the warm-up; peer-teaching (coaching roles); prepare the prizes for the culminating event.	
	19-20	Formal competition (graded competition, 2vs2; and mix-competition);	Formal competition (graded competition, 4vs4; and mix-competition);
		Culminating event with awards ceremony.	

Data collection

Data were collected using multiple qualitative sources to gain a robust understanding of the topic examined. First, the planning of all lessons was documented, with each one including the design of appropriate learning tasks that address the daily needs of students. Taking in reference the pedagogical principles of a SE-SGA unit, an explicit effort was made to ongoingly adjust the learning environments to the students' learning stages, game-related knowledge, and technical-tactical skills (Hordvik et al., 2019).

Second, a teacher's field diary was used to describe and reflect on: (i) the NT's pedagogical problems faced day-by-day when portraying the role of facilitator; (ii) the impact of the pedagogical strategies used; and (ii) students' responses to the pedagogical practice implemented. The field diary enabled the teacher to express detailly her emotions and perceptions about what could be improved or what worked better, and which goals had to be set for next lesson (Farias et al., 2018).

Third, six semi-structured focus-group (FG) interviews were conducted by the teacher-researcher, three of them at the middle of the school-term (after lesson 11-12), and the remaining at the end of the season. Overall, the FG interviews encompassed two main purposes: (i) to allow the students to debate their opinions and assess their viewpoints (Merriam and Tisdell, 2016); and (ii) to understand how the pedagogical intervention was influencing students' learning (Bracco et al., 2019). FG sessions were conducted in the host school's facilities and lasted approximately between 90 and 130 minutes. All FG interviews were video recorded and transcribed verbatim afterwards by the first author.

Data analysis

In line with the on-the-spot, interactive, and cyclical epistemological nature of AR, data collection and analysis were intertwined. Thus, following the procedures presented by Fereday and Muir-Cochrane (2006), a hybrid approach of inductive and deductive development of themes was used to analyze data. The study began as being deductive given the primary role that SE and SGA played in formulating research goals and consequent interview questions. The study became progressive inductive during the data analysis, with the purpose of generating new explanations that could more thoroughly comply the unique singularities emerging from the data (Patton, 2015).

Due to its potential for enabling the researcher to identify, analyze, and report patterns (themes) within the data set, a thematic analysis was used to examine data (Braun et al., 2016). The initial coding stage involved the immersion and familiarization with data, through repeated reading and identification of the relevant information. The second phase included an initial coding, with basic segments deemed meaningful being attached as labels. This process was developed with pre-existing research aims in mind (deductive), alongside openness to new segments (inductive) and it was completed manually by-hand. We critical engaged with the data at a semantic (i.e., the obvious meanings expressed) and a latent level (i.e., implicit ideas decoded from teacher and students' perspectives), but mostly semantic. The third phase included creating (initial) themes (i.e., grouping related information) pertinent to address the research questions. The fourth phase involved going back and forth through the data to check if the analysis suitably represents the message shared by all participants. The revision process helped to settle on a structure of one core theme which emphasizes all the other themes. Finally, the fifth phase involved naming the identified themes in a representative fashion.

Data trustworthiness

The dual role of teacher–researcher implies a systematic investigation of its own practice so that the pedagogical procedures could be improved. Such ongoingly analysis facilitates, in turns, an in-depth access to the complexity of the teaching-learning process (Farias et al. 2018). To acknowledge the consequences of and insider pedagogical intervention, and to establish a balance between closeness and distance (Coghlan, 2007), the credibility of the data was ensured through five main strategies: (i) participants were encouraged to share their honest opinions and viewpoints during the FG, so that students' opinions were not influenced by each other, and all the opinions were equally valued (Patton, 2015); (ii) considering that 'too much involvement' could influence students' answers, meaning that they could verbalize what the NT wanted to hear, the teacher was aware that students needed to lead the FG discussions. Thus, the NT read the questions to the students and only sporadically asked for more detailed information. This procedure enabled the students to expand their perspectives based on peer answers (Bodsworth and Goodyear 2017); (iii) data triangulation, which involved the use of multiple data collection sources (i.e., lesson plans, teacher's field diary and students' FG interviews) with the purpose of describe the phenomena through different perspectives (Denzin, 2012); (iv) regular peer-debriefings and collective data analysis among the research team, to minimize the risk for individual researcher bias in the interpretational analysis (Patton, 2015); and (v) students were frequently asked about the implicit meanings of their actions and verbal interventions (Corbin and Strauss, 2014).

Results

Data analysis generated two main themes representative of a hybrid SE-SGA season implemented by a NT as well as the students' perspectives about their learning experiences. The two themes are presented below.

1st AR-Cycle: The search of the right degree of student active engagement in the teaching-learning process: a time of higher teacher-guided student-centered activities.

The diagnosis assessment enabled the NT to become aware that "*there are different levels in the class: a group of students in stage 2 and another, made up most of the class, in stage 4. The teaching season will be designed according to this information, and students can, at any time, progress in the learning stage if so justified*" (Field diary, 3.1.2018). Since that moment, and considering the different learning

stages content development framework, learning tasks were designed to promote the development of students' abilities and volleyball knowledge, with the planning of lessons being adapted when necessary. For example, in the lesson plan of the third lesson "*there was a group having more difficulties than I expected and, so I had to adapt the original lesson plan* [which required] *leaving the 'mindset' 2v2 to enter the 'mindset' 4v4*" (Field diary, 8.1.2018).

From the outset of the season students highlighted that the teaching content addressed in the volleyball PE activities was centered on their difficulties and learning potential, "*if you* [NT] *were only concern to fully apply the* [national PE] *program, there would be no progression. Some leading students would have left out those who didn't play well*" (Isabel). In contrast, through this pedagogical intervention (i.e., work by skill levels, adaptation of lesson plans according to students' individual needs) the students noted that "*it wasn't the 'same businesses to everyone, the same old. The teacher adjusted the games to different levels (…) was a way to get to us*" (Maria) (1st FG, March).

Students of different learning stages emphasized several advantages arising from the combination of SE's features (formal competition, peer-teaching tasks) and the SGA's "inclusive-friendly" organization of the learning activities according to students' skill level: (i) the competition, "*it's fairer*" (Sofia), because there is not a significant discrepancy in the skill level of students who are competing against each other; (ii) it was the 'right amount of time' for practicing and learning new skills, because "*we can repeat the task several times... it won't turn out well for everyone at the first time*" (Mariana), in other words, students did not feel pressured by peers to learn at a different pace; and (iii) there were cooperative relationships between students of the same learning stage, "*because we have to work as a group, communicate, and help each other*" (Maria) (1st FG, March).

Nevertheless, despite similar learning opportunities were provided to students according to different learning needs, both lower- and higher-skilled participants pointed out some potential disadvantages if this type of activity organization extends over time. The higher-skilled students felt, "*it's better for us, but not for those who play poorly*" (Paulo) because "*they* [students from learning stage 2] *might not evolve if we can't help them...*" (Catarina). Still, the low-skilled students emphasized the importance of the heterogeneous organization of learning activities, "*if we were in mixed up groups, we could learn from other people*" (Luísa). Although students from learning stage 2 felt they progressed on their game-play ability, a critical constraint was that at some point, the students felt that working with the students from learning stage 4 "*would make us more competitive, because we had a more significant challenge and would give us more motivation to try to move on to the next level*" (Andreia) (1st FG, March).

One of the main purposes of the SE-SGA pedagogical intervention was to give students the opportunity to actively build cognitive skills. Thus, during the 1st AR-cycle students had opportunities to: (i) participate in problem-solving tasks; and (ii) design and apply learning tasks that were adjusted to their current skill level and knowledge.

That is, students from learning stage 2 had the task of proposing exercises for solving fundamental problems, as enhancing students' communication in 2vs2. In contrast, students from learning stage 4 had to think about learning tasks for more complex problems, as promoting the attacking shots into empty spaces in the 4vs4 (Lesson plan, 21.2.2018).

However, during the initial stage of the season, the lack of students' game-related knowledge (from students of both learning stages), combined with some difficulties in technical skills (from students of learning stage 2), led the NT to employ a more supportive intervention such as providing more explicit guidance to students. For example, "*open your hand to make the overhead pass, your fingers are closed*" (Lesson plan, 8.1.2018). The intention was to "*provide higher explicit guidance on the onset, so that in acquiring the basis of the game, later they could 'fly on their own*" (Field diary, 10.1.2018).

Nevertheless, when the teacher perceived that the students had previous knowledge of the task (sport content), or the game concepts were less complex (e.g., receiver/non-receiver notion in 2vs2 game), she used a more indirect teaching strategy (i.e., questioning). Even when the NT felt she had to "*make all decisions about the lesson plan, I ensured the students understood why we were learning each learning task*" (Field diary, 24.1.2018) to help students build their cognitive process based on the understanding of the problem-solving logic of games teaching and learning.

Students highlighted the importance of receiving more explicit guidance from the NT at an initial stage of the unit, "*none of us had the slightest idea about what some tactics (…) your support was critical, it helped us understanding the mobile square so the setter would be more active in game-play*" (Guilherme), and "*I'm glad that happened otherwise we would never move on*" (Catarina) (1st FG, March).

Additionally, students stressed the importance of the active mediation provided by the NT during the design of learning tasks, that "*feedbacked on our initial tactical proposals through questions and hints*" (Inês) instead of "*giving us a ready-made solution. No, we had to think about what was right, what was wrong, what we could change in the task*" (Paulo). This process allowed students "*not just do, because we were told to, it made us more autonomous*" (Matilde) (1st FG, March).

During the implementation of learning tasks, it was not always easy to "*explain our games to our teammates*" (Mariana), and "*being a coach, because we can be pointing out a mistake that is not really a mistake*" (Catarina). When students felt stuck, they could count with support of both their teammates and the NT who acted as a "guide on the side" to keep students on track: "*we called the superior* [laughs]" (Diogo), which was important because "*when we started drifting and simply playing, we lost our purpose, and we were practically not training at all*" (Guilherme) but "*the teacher asked what the main purpose of the game was. That helped because we were already drifting away from what we were supposed to learn*" (Andreia) (1st FG, March).

At the end of the 1st AR-cycle students felt that their active participation in instructional decision-making became gradually easier to deal with, mostly due to teacher's ongoing support. Specifically, the combined use of more explicit and indirect scaffolding strategies allowed students to develop a "meta-understanding" of the process: *"we explored, learned, and now we know how to teach and learn games"* (Catarina) (1st FG, March).

2nd AR-Cycle: Individually tailored transfer of responsibility to students: boosting students' commitment to learning activities

One of the major pedagogical intervention goals set by the NT for the 2nd AR-cycle included the attempt to boost the performance of lower-skill students and increase their motivation and engagement in the activities. To this purpose and based on students' opinions expressed during the FG interviews, the NT decided to adjust the initially designed teaching process (i.e., maintain the work by skill level during all volleyball unit) and along with a *"graded competition frame"* (Field diary, 5.3.2018), created a mix-competition. In other words, the NT used learning stages and informal graded competitions (i.e., leagues are arranged that match students of similar skill level against one another) during the first part of the pedagogical intervention. At the 2nd AR-cycle, in addition of graded competition, the NT formed mix-ability teams (please, see Methodology for more details).

Students commonly agreed on the appropriateness of the teacher's progressive structuring of the learning game-play development process, *"if we had all stayed together in the first group work, I think it wouldn't have gone well. They* [students with more abilities] *were automatically going to exclude us like in other years"* (Mariana), which made students feel heard and engaged with the activities. Students stated, *"teacher cares about our opinion and wants to know how we feel"* (Catarina), which *"increased our engagement"* (Isabel), namely, *"the competitive level of the students in stage 2 (…), I felt like a 'warrior', dear God, it was cool, different. I also believe that we managed to push our teammates' game-play up, help them with the attack positioning"* (Hugo) (2nd FG, April).

Nevertheless, some higher-skill students working in the mix-tournament felt somewhat frustrated due to the marked differences in the ability level of their teammates. For instance, *"at least in my team, we had a colleague that was literally taking us down. He was trying, it was noted. But he couldn't do better. I couldn't solve those problems. They were basic problems, like making the forearm pass, overhead pass... I understand that they have these difficulties, but it becomes very frustrating for us, who are from stage 4, and we are used to a different game-play pace"* (Guilherme) (2nd FG, April).

During this cycle, the teacher sought to further empower students to take more responsibility for, and control of, their own learning experiences. Based on the potential of the main characteristics of SE, the NT applied two major interventions, (i) the transfer of managerial decision-making to students (student-led organization of one-tournament day (Field diary, 12.3.2018)); (ii) student performance of multiple roles and participation in a higher number of peer-teaching activities (students were "formally" tasked during the activities to perform coaching roles, "helping in the teaching the 4vs4 dynamics to their learning stage 2 teammates" (Field diary, 19.3.2018)).

By performing different roles in the class (e.g., coaching, refereeing), students felt an increased sense of active control of the lesson activities. Students stated, *"the teaching process is being shared* [between teacher and students] *because we are definitely part of teaching"* (Manuel), which was the opposite of their previous PE experiences, where *"we didn't have a 'single word to say on the matter'"* (Paulo) (2nd FG, April).

Thus, at the end of this pedagogical intervention, students highlighted a positive and renewed idea about PE, based on their extended sense of autonomy: *"the teacher changed everything (…) we have an autonomy that we didn't have before"* (Paulo). Students also justified their positive feelings about the PE experiences with the use of the game-based approach to establish meaningful couplings between tactical demands and technical skills. According to students, *"the teacher valued the tactics more (…) the technique was built through the game"* (Catarina), which helped them to develop their skills and game' understanding, because *"we are not being robots. We are trying to think of what to do because, the tactical move is not always the same"* (Guilherme) (2nd FG, April).

On a final note, this pedagogical intervention seemed to have supported students' perception of higher game-based knowledge development, *"I think in all my years of physical education, I never learned as much as I did this year. I simply knew what I had to do in practice, but I didn't know why. If I was asked, I couldn't explain why we were doing that"* (Paulo) (2nd FG, April).

Discussion

This study aimed to examine how a novice PE teacher unfolded her pedagogical practice as a facilitator of learning during a hybrid SE-SGA volleyball season. In addition, the study investigated students' perceptions about their learning experiences and active involvement in building their own learning process. Overall, this study reinforces the importance of some pedagogical issues to prompt students' autonomy, sense of active control of the lesson activities, and the development of volleyball knowledge and game-play ability. Namely: (i) the way the sport-based subject-matter is taught, (ii) the level of responsibility taken up by students by their own learning experiences, (iii) the constant adaptation of the learning tasks to students' individual needs, and (iv) the combination of explicit and indirect teaching strategies. These pedagogical strategies seem to positively benefit students' commitment and engagement in PE. Next, the discussion of results is divided according to each AR-cycle.

1st AR-Cycle

The 1st AR-cycle diagnosed students' different ability levels, which led the NT to adapt the teaching-learning process instead of full compliance with the national PE program. That is, instead of using a formal 6v6 game-form as foreseen for the 12th school grade, the NT chose to use

game forms suited to the students' learning needs (i.e., 2vs2 and 4vs4). Two possible reasons may explain NT' adaptability. First, the insider AR-design allowed the teacher to continuously adjust procedures to the dynamic nature of the teaching–learning process (Silva et al., 2021a). This finding aligns with the work of Özlem and Ferda (2019), where the NT, through an AR project, and a constant process of reflection, became more conscious and able to change its practice. Second, the characteristics of the PETE program in which the NT graduated, a program with specific training in student-centered models. For instance, in a recent systematic review conducted by Silva et al. (2021b), the authors concluded that teacher's occupational socialization experiences are a strong predictor of their adherence (or lack of that) to these pedagogies.

Over the 1st AR-cycle, students emphasized as main advantages of using learning stages the establishment of cooperative relationships, the fairness of competition, and the 'right amount of time' for practicing and learning new skills. These results align with previous research on student-centered models that shows the important role social interactions play when students are learning skills or tactical tasks (Koekoek and Knoppers, 2015). Particularly within SE, research has been showing the potential of the model to foster the development of interpersonal skills (e.g., a sense of fairness) (Farias et al., 2020), the increasement of students' enjoyment, satisfaction, enthusiasm and engaged participation (Bessa et al., 2019). Students' feelings concerning the 'right amount of time' for practice and learn new skills could be related with the characteristics of the SGA, where the acquisition of skills to play is progressive, and considers students' individual learning stage within a positive learning environment (Mesquita, 2006). This result reinforces the need teachers to 'distribute' the given practice time (i.e., number of lessons available) according to students' learning needs and their learning pace (i.e., the use of learning stages) (Iserbyt et al., 2010).

Throughout the 1st cycle, particularly low-skilled students (learning stage 2) consider that the initial arrangement of learning stages was only beneficial until they manage to overcome their first difficulties. After this moment, the students felt that experiencing new challenges could be positive for their technical and tactical development and for their motivation for practice as well. This result shows that although students with lower skill levels benefit from working and playing against students of similar skill levels, which is aligned with the findings of Hastie et al. (2017), it is also important that students work through gradually challenging game-forms (Araújo et al. 2019). To act upon this issue, the constant teacher's self-reflection process and genuine interest in students' voices were critical aspects. This was also important in other research involving NTs, where the challenges faced in their practice were more easily resolved through reflections and dialogue with students (Bodsworth and Goodyear, 2017; Silva et al., 2021a).

Still over the 1st AR cycle, in order to provide students with an active involvement across the season, students were challenged by the NT to participate in problem-solving tasks and to take on more responsibility for instructional tasks (i.e., students began to design the learning tasks that they deemed important for their teams' performance

improvement). The difficulties felt by students are in congruence with the results of the study conducted by Araújo et al. (2017), that is, difficulties on error diagnosis. When students felt stuck, the NT gave them the opportunity to look for solutions to these problems, using questions and hints, with the aim of stimulate autonomous thinking (Dyson et al., 2004). Corroborating the results of Gil et al. (2019), this strategy shown to be decisive for the development of students' decision-making ability, which allowed them to start to have success on those tasks.

Allied to that, the findings of this AR-cycle stressed the importance of combining indirect and explicit teaching strategies according to students' prior knowledge and skill level, to sustain students' successful active involvement in the learning tasks (Metzler, 2017). As previously identified in the study of Silva et al. (2021b), the dynamic and complementary use of both indirect and direct instruction by teachers, when tailored to students' current needs of mediation, is a strategy extremely valued by students. Furthermore, through this mix pedagogical intervention (indirect and explicit teaching strategies), the NT created an environment simultaneously supportive and challenging, which encouraged students to be more actively involved in PE (Mesquita et al., 2015).

2nd AR-Cycle
Considering the results of the previous cycle (i.e., the lack of motivation for practice and the need of students from learning stage 2 experience new challenges), the NT created a tournament parallel to those already planned initially (i.e., a mix-tournament beyond the graded competition). Although students of both learning stages participated in the same competition, the game rules were adjusted to their needs. might explain why students feel valued, heard, and engaged. This teaching adjustment made students feel valued, heard, and engaged, which corroborates the findings of Oliver and Kirk (2015), where the use of democratic pedagogies, in which students and teachers cooperate and negotiate, were mentioned as vital to improve the learning process in PE.

Furthermore, the NT gave to students more space for active intervention in the class, by transferring managerial decision-making to students, and allowing them to perform multiple roles and participate in a higher number of peer-teaching activities. This extension of greater students' empowerment over their own learning experiences was related to the teacher's need to recognize students as experts in their own learning (Ennis, 2014). Indeed, other investigations claimed that it can take some time for teachers transfer power decision-making to students, particularly when they are inexperienced (Curtner-Smith and Sofo, 2004) and, even more, implementing game-based approaches (Wang and Ha, 2013).

In this study, the opportunity to contribute for the class in a more active way allowed students to felt autonomous and endowed by an increased sense of control in lesson activities, which seems to contribute to a positive perspective about PE. This finding suggests that for students to attribute meaning to PE - a foundational curricular goal (Fletcher and Chróinín 2021), it is important that teachers listen to the students, consider their opinions, and share

decision-making power with them (Phillips et al., 2021).

Furthermore, the use of a game-based approach that subordinate the teaching of technical skills to the teaching of tactics, and face students with problem to challenge their capacity for understanding and performing game play (SGA, Mesquita et al., 2005) was particularly powerful for students assign enhanced meaning to the games' learning. This finding highlights the importance of students to learn through game-based approaches, and to understand what, how, and when to apply technical skills within the broader context of game play (García-Ceberino et al., 2020). Additionally, Morales-Belando et al. (2018) showed the positive effect of using tactical approaches on students' perceived competence, which, in turn, seems to be positively related with the fulfillment of their sense of autonomy, and enjoyment (Gil-Arias et al., 2017). Notwithstanding the contribution of these two studies, they were both conducted with experienced teachers while implementing Teaching Games for Understanding (Morales-Belando et al., 2018) and Teaching Games for Understanding/SE units of short-term (Gil-Arias et al., 2017). In this sense, this study presents novel longitudinal information about the potential of combining the SE and the SGA (a model that consider the specificity of the content subject-knowledge) by teachers at the beginning of career.

Conclusion

This paper provides a thoughtful example of how a PE teacher at the beginning of career adapted the pedagogical practice to act as a facilitator of learning through a hybrid SE/SGA unit. In conclusion, the use combined of a teaching model that allow a great student-centered environment (e.g., Sport Education) and other that emphasize the specificity of the content subject-knowledge (e.g., Step-Game Approach for non-invasion games) seems to allow the NT to adjust her pedagogical intervention as facilitator to students' individual learning needs. In consequence of such intervention, the students perceived that they developed their autonomy and sense of active control of the class activities, their abilities and volleyball-based knowledge, which made them more interested and engaged in PE.

Future research should continue to focus on the professional development of NTs through longitudinal AR designs. Despite the use of multiple data sources and several trustworthiness criteria, future studies on this topic could also benefit from the use of video-audio as a complementary data source data. For example, to collect images of teacher and students, and at the same time, their voices. This could provide a more accurate analysis of the teaching-learning process, and of the important details of the interaction between teacher and students and among students.

In practical terms, based on our findings we recommend that PETE and professional development programs should be more focused on: (i) developing teacher's ability to game design, to use effective questioning and gradually to empower students to assume an active role over their learning experiences; (ii) offering school placement training and postgraduate professional practice based on student-centered approaches.

References

Araújo, R., Hastie, P., Lohse, K., Bessa, C. and Mesquita, I. (2019) The long-term development of volleyball game play performance using Sport Education and the Step-Game-Approach model. *European Physical Education Review* **25,** 311-326. https://doi.org/10.1177/1356336X17730307

Araújo, R., Hastie, P., Pereira, C. and Mesquita, I. (2017) The evolution of student-coach's pedagogical content knowledge in a combined use of Sport Education and the Step-Game-Approach model. *Physical Education and Sport Pedagogy* **22,** 518-535. https://doi.org/10.1080/17408989.2017.1294668

Araújo, R., Mesquita, I., Hastie, P. and Pereira, C. (2015) Students' game performance improvements during a hybrid Sport Education-Step-Game-Approach volleyball unit. *European Physical Education Review* **22,** 185-200. https://doi.org/10.1177/1356336X15597927

Bessa, C., Hastie, P., Araújo, R. and Mesquita, I. (2019) What do we know about the development of personal and social skills within the Sport Education model: A systematic review. *Journal of Sports Science & Medicine* **18,** 812-829. https://pubmed.ncbi.nlm.nih.gov/31827367/

Bodsworth, H. and Goodyear, V. (2017) Barriers and facilitators to using digital technologies in the Cooperative Learning model in Physical Education. *Physical Education and Sport Pedagogy* **22,** 563-579. https://doi.org/10.1080/17408989.2017.1294672

Bracco, E., Lodewyk, K. and Morrison, H. (2019) A case study of disengaged adolescent girls' experiences with teaching games for understanding in Physical Education. *Curriculum Studies in Health and Physical Education* **10,** 207-225. https://doi.org/10.1080/25742981.2019.1632724

Braun, V., Clarke, V. and Weate, P. (2016) Using thematic analysis in sport and exercise research. In: Routledge handbook of qualitative research in sport and exercise. Eds: Smith, B. and Sparkes, A.C. London: Routledge. 191-205.

Bunker, D. and Thorpe, R. (1982) A model for the teaching of games in secondary schools. *Bulletin of Physical Education* **18,** 5-8.

Casey, A., Hill, J. and Goodyear, V. (2014) "PE doesn't stand for Physical Education. It stands for public embarrassment": Voicing experiences and proffering solutions to girls' disengagement in Physical Education. Editors: Sara Barnard Flory, Amy Tischler, Stephen Sanders. Publisher: Rowman & Littlefield

Chêne, E., Lamouche, C. and Petit, D. (1986) Volley-ball: de l'école... aux associations: De l'école. Revue Education Physique et Sport.

Coghlan, D. (2007) Insider action research: opportunities and challenges. *Management Research News* **30,** 335-343. https://doi.org/10.1108/01409170710746337

Corbin, J. and Strauss, A. (2014) Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory. Sage Publications.

Curtner-Smith, M. and Sofo, S. (2004) Preservice teachers' conceptions of teaching within Sport Education and multi-activity units. *Sport, Education and Society* **9,** 347-377. https://doi.org/10.1080/13573320412331302430

Denzin, N. (2012) Triangulation. *Journal of Mixed Methods Research* **6,** 80-88. https://doi.org/10.1177/1558689812437186

Dyson, B., Griffin, L. and Hastie, P. (2004) Sport Education, Tactical Games, and Cooperative Learning: Theoretical and pedagogical considerations. *Quest* **56,** 226-240. https://doi.org/10.1080/00336297.2004.10491823

Ennis, C. (2014) What goes around comes around ... or does it? Disrupting the cycle of traditional, sport-based Physical Education. *Kinesiology Review* **3,** 63-70. https://doi.org/10.1123/kr.2014-0039

Farias, C., Hastie, P. and Mesquita, I. (2018) Scaffolding student-coaches' instructional leadership toward student-centred peer interactions:

A yearlong action-research intervention in sport education. *European Physical Education Review* **24,** 269-291. https://doi.org/10.1177/1356336X16687303

Farias, C., Wallhead, T. and Mesquita, I. (2020) "The project changed my life": Sport Education's transformative potential on student physical literacy. *Research Quarterly for Exercise and Sport* **91,** 263-278. https://doi.org/10.1080/02701367.2019.1661948

Fereday, J. and Muir-Cochrane, E. (2006) Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods* **5,** 80-92. https://doi.org/10.1177/160940690600500107

Fletcher, T. and Chróinín, D.N. (2021) Pedagogical principles that support the prioritisation of meaningful experiences in Physical Education: Conceptual and practical considerations. *Physical Education and Sport Pedagogy*. https://doi.org/10.1080/17408989.2021.1884672

García-Ceberino, J., Gamero, M., Feu, S. and Ibáñez, S. (2020) Differences in technical and tactical learning of football according to the teaching methodology: A study in an educational context. *Sustainability (Switzerland)* **12(16),** 6554. https://doi.org/10.3390/su12166554

Gil, V., Álvarez, F., Pizarro, A. and Domínguez, A. (2019) Questioning as a fundamental tool for Physical Education students to develop decision-making skills. *Movimento* **25.**

Gil-Arias, A., Diloy-Pena, S., Sevil-Serrano, J., Garcia-Gonzales, L. and Abos, A. (2021) A hybrid TGfU/SE volleyball teaching unit for enhancing motivation in Physical Education: A mixed-method approach. *International Journal of Environmental Research and Public Health* **18(1),** 110. https://doi.org/10.3390/ijerph18010110

Gil-Arias, A., Harvey, S., Cárceles, A., Práxedes, A. and Del Villar, F. (2017) Impact of a hybrid TGfU-Sport Education unit on student motivation in Physical Education. *Plos One* **12(6),** e0179876. https://doi.org/10.1371/journal.pone.0179876

Hastie, P. and Mesquita, I. (2016) Sport-based Physical Education. In: Routledge handbook of Physical Education pedagogies. Ed: Ennis, C. New York: Routledge. 664.

Hastie, P., Ward, J. and Brock, S. (2017) Effect of graded competition on student opportunities for participation and success rates during a season of Sport Education. *Physical Education and Sport Pedagogy* **22,** 316-327. https://doi.org/10.1080/17408989.2016.1203888

Hordvik, M., MacPhail, A. and Ronglan, L.T. (2019) Learning to teach Sport Education: investigating a pre-service teacher's knowledge development. *Sport, Education and Society* **24,** 51-65. https://doi.org/10.1080/13573322.2017.1322948

Iserbyt, P., Elen, J. and Behets, D. (2010) Instructional guidance in reciprocal peer tutoring with task cards. *Journal of Teaching in Physical Education* **29,** 38-53. https://doi.org/10.1123/jtpe.29.1.38

Kemmis, S., McTaggart, R. and Nixon, R. (2014) The Action Research Planner. Singapore: Springer. https://doi.org/10.1007/978-981-4560-67-2

Kirk, D. (2010) Physical education futures. London: Routledge. https://doi.org/10.4324/9780203874622

Koekoek, J. and Knoppers, A. (2015) The role of perceptions of friendships and peers in learning skills in Physical Education. *Physical Education and Sport Pedagogy* **20,** 231-249. https://doi.org/10.1080/17408989.2013.837432

Koekoek, J., Kamp, J., Walinga, W. and Hilvoorde, I. (2019) Exploring students' perceptions of video-guided debates in a game-based basketball setting. *Physical Education & Sport Pedagogy* **24,** 519-533. https://doi.org/10.1080/17408989.2019.1635107

McMahon, E. and MacPhail, A. (2007) Learning to teach Sport Education: The experiences of a pre-service teacher. *European Physical Education Review* **13,** 229-246. https://doi.org/10.1177/1356336X07076878

Merriam, S.B. and Tisdell, E.J. (2016) Qualitative research: A guide to design and implementation. 4th edition. San Francisco: CA: Jossey-Bass.

Mesquita, I. (2006) Ensinar bem para aprender melhor o jogo de voleibol. In: *Pedagogia do desporto*. Eds: Tani, G., Bento, J. and Petersen, R. Rio de Janeiro: Guanabara Koogan. 327-343.

Mesquita, I., Coutinho, P., Martin-Silva, L.D., Parente, B., Faria, M. and Afonso, J. (2015) The value of indirect teaching strategies in enhancing student-coaches' learning engagement. *Journal of*

Sports Science and Medicine **14,** 657-668. https://pubmed.ncbi.nlm.nih.gov/26336354/

Mesquita, I., Graça, A., Gomes, A.R. and Cruz, C. (2005) Examining the impact of a Step Game Approach to teaching volleyball on student tactical decision making and skill execution during game play. *Journal of Human Movement Studies* **48,** 469-492.

Metzler, M. (2017) Instructional Models for Physical Education. 3rd edition. New York: Routledge. https://doi.org/10.4324/9781315213521

Morales-Belando, M.T., Calderon, A. and Arias-Estero, J.L. (2018) Improvement in game performance and adherence after an aligned TGfU floorball unit in Physical Education. *Physical Education and Sport Pedagogy* **23,** 657-671. https://doi.org/10.1080/17408989.2018.1530747

O'Leary, N. (2014) Learning informally to use Teaching Games for Understanding: The experiences of a recently qualified teacher. *European Physical Education Review* **20,** 367-384. https://doi.org/10.1177/1356336X14534359

Oliver, K.L. and Kirk, D. (2015) Girls, Gender and Physical Education: An Activist Approach. 1st edition. New York: Routledge. https://doi.org/10.4324/9781315796239

Özlem, A. and Ferda, G. (2019) Teacher who (cannot) change: Experimental processes of Physical Education teachers by means of pedagogical innovations at the time of their professional development. *Egitim ve Bilim* **44,** 401-420.

Patton, M.Q. (2015) Qualitative Research & Evaluation Methods. Fourth edition edition. United States of America: SAGE.

Phillips, S.R., Marttinen, R., Mercier, K. and Gibbone, A. (2021) Middle school students' perceptions of Physical Education: A qualitative look. *Journal of Teaching in Physical Education* **40,** 30-38. https://doi.org/10.1123/jtpe.2019-0085

Rink, J.E. (1993) Teaching Physical Education for learning. 2nd edition. St. Louis: Mosby.

Siedentop, D. (1994). Sport education: Quality PE through positive sport experiences, Human Kinetics, Champaign.

Silva, R., Farias, C. and Mesquita, I. (2021a) Cooperative Learning contribution to student social learning and active role in the class. *Sustainability* **13,** 8644. https://doi.org/10.3390/su13158644

Silva, R., Farias, C. and Mesquita, I. (2021b) Challenges faced by pre-service and novice teachers in implementing student-centred models: A systematic review. *European Physical Education Review* **27(4),** 798-816. https://doi.org/10.1177/1356336X21995216

Wang, C. and Ha, A. (2013) The theory of planned behaviour: Predicting pre-service teachers' teaching behaviour towards a constructivist approach. *Sport, Education & Society* **18,** 222-242. https://doi.org/10.1080/13573322.2011.558572

Key points

- The alliance between the Sport Education and the Step-Game Approach allows the novice teacher to adjust her pedagogical intervention as facilitator of learning to students' individual learning needs.

- Students perceived that they developed their autonomy and sense of active control of the class activities, their abilities and volleyball-based knowledge, which made them more interested and engaged in PE.

- Future studies should consider longitudinal AR designs and video-audio as a complementary data source data.

- PETE and professional development programs should be more focused on developing teacher's ability to game design, to use effective questioning and gradually to empower students to assume an active role over their learning experiences. Also, offer school placement training and postgraduate professional practice based on student-centered approaches.

AUTHOR BIOGRAPHY

Rita Maria Rodrigues da SILVA
Employment
Institution affiliation: Centre for Research, Education, Innovation and Intervention in Sport (CIFI2D), Faculty of Sport, University of Porto, Portugal.
Degree
PhD
Research interests
Sport pedagogy, instructional models and physical education.
E-mail: rita_mrsilva_@hotmail.com

Cláudio Filipe Guerreiro FARIAS
Employment
Centre for Research, Education, Innovation and Intervention in Sport (CIFI2D), Faculty of Sport, University of Porto, Portugal
Degree
PhD
Research interests
Sport pedagogy, physical education teacher education, coach education, student-centered model-based practice
E-mail: claudiofarias@fade.up.pt

Ana Gracinda Alves RAMOS
Employment
Centre for Research, Education, Innovation and Intervention in Sport (CIFI2D), Faculty of Sport, University of Porto, Portugal.
Degree
PhD
Research interests
Sport pedagogy, performance analysis, instructional models, volleyball
E-mail: anagracinda93@gmail.com

Isabel Maria Ribeiro MESQUITA
Employment
Centre for Research, Education, Innovation and Intervention in Sport (CIFI2D), Faculty of Sport, University of Porto, Portugal.
Degree
PhD
Research interests
Coaching, instructional models, physical education, volleyball
E-mail: imesquita@fade.up.pt

✉ **Rita Silva**
Centre of Research, Education, Innovation and Intervention in Sport (CIFI²D). Faculty of Sport, University of Porto Rua Dr. Plácido Costa, 91, 4200-450, Porto, Portugal