Abstract

Purpose: The purpose of this study was to provide a year-long examination of the scaffolding processes used by a teacher in order to support student coaches in their instructional leadership responsibilities during seasons of Sport Education. The intervention sought to enable coaches to conduct problem-solving activities and instructional interactions that would actively involve teammates in the discovery of knowledge and construction of their own learning experiences. Method: Twenty-six seventh grade students participated in four consecutive seasons of Sport Education (Basketball, Handball, Soccer, and Volleyball). The research involved four action-research iterative cycles of planning, acting, monitoring, and fact-finding. Data collection included semi-structured interviews with teams as well as exclusively with the coaches, lesson observations, and a field diary kept by the first author who assumed the role of practitioner-researcher. Results: The findings showed it was necessary to explicitly teach the coaches specific instructional strategies for constructivist peer interactions to emerge. However as coaches became increasingly self-assisted, they were able to promote activities more relevant to the learning needs of teammates. Further, the involvement of the students in taking responsibility for peer-teaching emerged late in the school year. The scaffolding process was found to be a non-linear process contingently adjusted in reference to aspects such as coaches’ mastery of processes, the complexity of the domain-specific content, and nature of the sport. Conclusions: This study gives credence to the advocacy that specific training is necessary if students are to develop the ability to engage teammates actively in learning interactions.

Keywords: teacher as researcher, peer interactions, problem-solving, facilitator
Scaffolding student-coaches’ instructional leadership in Sport Education: A yearlong action-research intervention

A stream of constructivist “student-centeredness” has been increasingly placed in the forefront of educational policies, national curricula and teacher education worldwide under the tutelage of an effective promotion of a broad range of cognitive, educational, and health outcomes (Tannehill, MacPhail, & van der Mars, 2013). From a constructivist point of view, learning involves a cognitively, socially and self-regulated construction of knowledge by learners (Cobb, 1994), with the core underlying assertion being that students actively construct knowledge through integrating new ideas with their own thinking, past experiences and knowledge, and through interacting with others in the context of particular social environments.

Within the field of physical education, the adoption of constructivism has implied a conceptualization of learning as “a problem-solving process in which the instructional context provides opportunities for the learner to discover and construct their own understanding of facts and relationships” (Slade, Webb, & Martin, 2015, p. 69). Considering the central role of the teaching and learning of team sports within physical education curricula, such a conceptualization was first captured by the emergence of tactical approaches for teaching games and sports based on problem-solving frameworks of instruction (e.g., Teaching Games for Understanding; Bunker & Thorpe, 1982).

Amongst such seminal student-centered models, Sport Education has been taken a prominent place as it holds conceptual and pedagogical structures pivotal to promotion of “meaningful, purposeful, and authentic learning activities presented and practiced by students” (Dyson, Griffin, & Hastie, 2004, p. 227). As a case in point, the development of Siedentop’s (1994) notion of the competent sportsperson strongly resonates with the problem-solving concerns of more cognitive-based approaches.
Concurrently, a particularly distinctive and pedagogically challenging structure of Sport Education is the extent to which students take control and ownership of their own learning. Within seasons of Sport Education, a considerable amount of instructional responsibility is given to students in the role of team leaders or coaches. Examples of these responsibilities include the presentation of tasks when practicing motor skills, strategic thinking related to game tactics, as well as the management of group dynamics.

Taking into account the constructivist nature of Sport Education, the teacher is called to assume the role of a facilitator, and so a central piece of a teacher’s pedagogical intervention needs to be focused on providing practice for the leadership skills necessary for successful coaching. On one hand, coaches need to develop an understanding of the sports content (rules and tactics), but perhaps more importantly, they need to develop a beginning knowledge base about teaching, learning, and instruction, it is hardly likely that coaches will be able to engage teammates in constructivist instructional interactions.

With regard to research on Sport Education conducted to date, there is a glaring scarcity of empirical studies that examine the teacher’s role as a facilitator. First, it is not known how teachers are interpreting and enacting the role of facilitator and to what extent these actions are aligned with the constructivist assumptions upholding the model. Second, there is an absence of information as to the best mechanisms through which teachers can prepare coaches to cope with the demands of instructional leadership (Wallhead & O’Sullivan, 2005; Hastie et al., 2011).

The didactic analysis of student coaching effectiveness conducted by Wallhead and O’Sullivan (2007) provides the only example within the Sport Education literature that has placed this concern at the foreground. In that study, Wallhead and O’Sullivan (2007) focused on the development of content taught by one coach during peer-teaching tasks and the performance of his six teammates. From the brief description provided of the teacher’s
instructional procedures it was possible to discern there was an attempt to scaffold the coach’s
construction of knowledge by highlighting the associations between knowledge structures
across tasks. There was however a predominant use of direct instruction and the delivery of
verbatim information contained in task cards and demonstration of skills during in-task
interventions. To wit, the coaches were provided with the solutions to the problem of the task
in the form of coaching points. While effective in part, the coach in this study still struggled
with higher order teaching skills, and by consequence, experienced difficulties in areas such as
appropriate demonstration, error diagnosis and task modification (Wallhead & O’Sullivan,
2007).

While particularly insightful, an acknowledged limitation within the Wallhead and
O’Sullivan (2007) study was that it encompassed a single season, and then only with a single
team. This small sample restricts the potential for capturing the nuances of the ongoing
engaging nature of teaching and learning, and the generation of what Gershuny (1988) calls
“dynamic data” that allow the establishment of connections between events widely separated
in time. By consequence, we are still left to discover issues such as the direction and
magnitude of the change within student-coaches learning. Finally, the didactic focus of the
analysis adopted by Wallhead and O’Sullivan (2007) did not focus on the nature of discourse
used, which did not allow insight into the levels of cognitive engagement experienced by these
coaches during their instructional interactions.

**Scaffolding as instructional support**

In the area of teaching and learning, the notion of scaffolding as instructional support
has emerged to explain the role a teacher or a more knowledgeable peer can play in joint
problem-solving activities with and among students. Scaffolding can be conceptualized as a
temporary pedagogical structure that Smit, van Eerde, and Bakker (2013, p. 817) suggest can
“help pupils to perform a task they cannot complete by themselves and that is intended to
bring pupils gradually to a state of competence in which they can complete a similar task or process independently.” It is important to consider however, that scaffolding in not a technique that can be applied in the same manner in every learning situation, but rather it should be thought of as both adjustable and temporary.

In attending to such variability, van de Pol et al. (2010) suggested the means for scaffolding should be flexibly utilized by teachers taking into account aspects such as the complexity of the learning content, student on-going progress, or the moment in the season. For instance, based on the perceived need for filling in gaps in coaches’ current level of awareness, the degree of teacher guidance may fluctuate between using more guidance-based instruction (e.g., instructing: “prescribing what to do”; modeling: “offering behavior for imitation”; explaining: more detailed explanatory structures that organize and justify learning) to more discovery-based strategies (hints: “taking over parts of the task (provision of clues) that the student is not yet able to perform; questioning: “asking questions that require an active cognitive answer”)) (van de Pol et al., 2010, p. 277).

In the specific case of Sport Education, where coaches take the lead of instructional processes, and particularly when the activities involve learning of team sports (in which cognitive processes are key), the scaffolding process follows highly complex contours. Because coaches are expected to become increasingly self-assisted, the scaffolding must operate both at a cognitive (e.g., sport-specific content knowledge) and metacognitive level (e.g., knowledge of teaching and learning processes). That is, coaches need to develop problem representation and solution development skills so that they are able to identify their teammates’ errors and tactical problems and select appropriate solutions. In addition, because in Sport Education students in general are expected to be actively engaged in problem-solving, discovery and understanding of game-play, scaffolding must also involve the structuring of peer interactions. More specifically, the coaches as main instructional leaders should be
Guided to follow particular lines of discourse such as using questioning for prompting teammates’ comprehension of game problems (Ward & Lee, 2005).

In building on the arguments put forward so far, the present study was designed to address a number of potential shortcomings of research identified in the reviews of Wallhead and O’Sullivan (2005) and Hastie et al. (2011). Specifically, although in the field of general education the practical application of scaffolding has been explored within constructivist approaches, in the particular context of Sport Education, both its conceptualization and enactment has been completely neglected. The central purpose of this study was to provide an in-depth, on-going, and long-term examination of the scaffolding processes used by a teacher for empowering students in the role of coaches toward becoming knowledgeable, competent, and self-assisted instructional leaders. Concurrently, the study aimed to provide an account of the effects of an intervention designed explicitly to develop coaches’ ability to conduct student-centered instructional interactions. With a focus placed at a micro-level of peer interactions, an examination was conducted of the progress in coaches’ ability to use discourse that implicated teammates proactively in problem-solving processes, discovery and construction of knowledge.

**Method**

**Design**

This research project was drawn from the tenets of action research (Lewin, 1946), and followed the “teacher-as-researcher” design seen previously in studies in sports pedagogy by Gubacs-Collins (2007) and Casey and Dyson (2009). That is, in his dual role of teacher and researcher, the first author endeavored to “identify and unpack (…) the issues, problems, dilemmas and challenges that arise during teaching” (Rovegno, Nevett, & Babiarz, 2001, p. 343), as well as to better understand and improve his own practice.
In an attempt to grapple with the complex, situated, multi-layered, and on-going engaging development of instruction, knowledge, and group-relational dynamics in Sport Education, the study encompassed a full academic year that comprised seasons of Basketball, Handball, Soccer and Volleyball. Within each of these units, the four iterative cycles of action research (planning, acting, monitoring, and reflecting) were adopted in order to inform the planning of the next season. The first season (Basketball), represented a reconnaissance (or baseline) in which the goal was to assess the current status of the coaches’ instructional skills, while the following three cycles (Handball, Soccer, and Volleyball) involved specific interventions that were designed to address problems or issues not resolved in the preceding season.

Setting and Participants

The participants in this study were 10 girls and 16 boys (aged between 12 and 14 years old) enrolled in the seventh grade at a school in northern Portugal, and who participated in physical education lessons two times per week. Prior to this project, the students had no previous experience with Sport Education.

In the first lesson of the school year, the class elected three students as team coaches who have been given the pseudonyms of Rose, Peter, and Chris. Although it was not a mandatory condition, the three coaches had multi-year experience in community-based sports such as Soccer and Basketball. The class was then divided into three heterogeneous but balanced teams who took the names of “The Eagles”, “The Koalas”, and “The Kangaroos”. At the completion of the first season, it was suggested by all students that the teams’ composition and the students in coaching roles should be maintained throughout the year. As a result, this study is focused on the instructional leadership of Rose, Peter and Chris.

The teacher-as-researcher was an experienced physical education teacher (over 10 years) who had significant experience using student-centered instructional models (including
Sport Education) over the past six years. He had also participated in previous research activities both for the purposes of gaining practical experience in the role of practitioner-researcher and for developing conceptual-to-practical understanding on the impact of model-based practice on students’ learning.

**The Sport Education Seasons**

This study encompassed four consecutive units of team sports that embraced the entire school year (from October to June). The seasons included the four immutable aspects that Hastie and Mesquita (2016) suggest cannot be compromised if one is to correctly describe a particular unit within physical education as Sport Education. These include (a) that the season takes place over an extended period of time, (b) the presence of persisting teams, (c) the presence of developmentally appropriate competition consisting of small-sided games, and (d) that students take upon roles and responsibilities other than that of player.

**The Learning Content.** The instruction within seasons followed a tactical approach to content development for underpinning student learning of the four team sports. In each season, either in the format of team game practice sessions or formal/informal competition matches, the students were expected to become proficient players of a principal game form representative of the full version of the team sport. Students also learned tactical skills and techniques through practice tasks that were designed to solve tactical problems encountered during practice of the game form. Table 1 provides complete details of the goals and design of each season.

**Teacher’s Instructional Support.** In this study, the coaches as team leaders were at the forefront of most instructional processes. Additionally, learning within each season was conceptualized as a problem-solving process where students progressed by learning to identify tactical problems and appropriate solutions to solve the situations. The coaches were expected to support the problem-solving activities within teams.
In order to support the coaches in their new roles, eleven leadership seminars were conducted during the three intervention seasons. These seminars took place three times in each of Handball and Soccer, and five times in Volleyball. Each lasted in average between 35 to 50 min and involved the coaches in a series of activities to support the development of their instructional skills. Examples included observing videotapes of critical events in the coaches’ instruction and discussing instructional strategies congruent with student-centered premises (e.g., modeling freezing-rehearsal instruction, training of the question-asking process…).

Seminars also involved extensive observation and discussions of particular moments in each team’s game-play. This had a focus on the domain-specific content of the sports with the intention of developing, for example, the coaches’ ability to identify tactical problems and construct appropriate solutions to their teams’ game problems. The leadership seminars also served the purpose of consciousness-raising about the impact of individual interventions of teammates’ achievement while also providing data with respect to the coaches’ evolving conceptions on teaching and learning. Table 2 provides an overview of the focus, context, strategies, and scaffolding means used by the teacher along the school year to mediate and prepare the coaches to instructional leadership.

Data Collection

Data for this study were gathered from lesson observations, a field diary, semi-structured group interviews, and a leadership seminar diary.

Lesson Observations. In every lessons, two crossed-angle digital camcorders were set in the gymnasium in order to capture all class events and student interactions. The teacher and each of the three coaches wore an audio device within an armband in order to couple their verbal instructions with the video images. The intention was to retain the authenticity of the dialogues and to record the most sensitive nuances of on-going instructional and relational interactions that could not be noticed at the real moment of the occurrence by the teacher-as-
researcher. The use of the program *Adobe Premiere Pro CC* allowed compacting the video and audio recordings of each session in a single file.

**Field Diary.** On an on-going basis, the teacher-researcher conducted the synchronized examination of the lesson observations as soon as possible after each lesson to inform the subsequent pedagogical (e.g., planning of learning activities, focus for coaches’ preparation) and research procedures (e.g., the theme of group interviews). These notes were kept in the form of a field diary and were written alongside a chronological record of the class events registered during the lesson observations. This diary included a comprehensive analysis of what children said, did, and produced, together with the teacher-researcher’s interpretations in relation to student thinking, understanding, and learning. As per Rovegno et al. (2001), also annotated was contextual information related to issues of curriculum development (e.g., type of tasks, learning goals, pedagogical intentions). While key instructional sequences occurring between coaches and teammates were purposefully selected and transcribed verbatim, others received explanatory labels to allow a later and more detailed revisit of the data. The field diary then, served as more than a simple collection of facts. Rather, it was supplemented by analytic notes designed to integrate theory into the analysis, and to reconceive and elaborate on what was being learned. Finally, the diary included notes derived from the post-cycle reflective analyses.

**Interviews.** Twenty-four focus group interviews (eight for each of the three teams), were conducted throughout the year, each lasting approximately 90 minutes. The first set of interviews took place during the first week of each season, while the second occurred immediately following that season. All interviews were video and audiotaped.

The teacher-researcher conducted the team-interviews in an attempt to explore the participants’ feelings and experiences about the different seasons. The interviews were semi-structured, with a list of questions and topics set before each interview to gather the students’
perspective about critical events occurred during the lessons. In addition, the students were often prompted to bring their own issues to debate while the interview script was open enough to follow any lines of students’ speech, debate, and reasoning that were considered relevant.

**Leadership Seminar Diary.** All leadership seminars were audio and video recorded. The on-going analysis of coaches’ interventions during the seminar allowed the teacher-researcher to keep a perspective on their development with regard to their conceptions of teaching and learning, content, and instructional knowledge. It served also to generate stimulus questions to be used in the focus group interviews to prompt teammates’ perspectives on some procedures adopted by coaches.

**Data Analysis**

To promote familiarity with the material, the teacher-researcher observed and listened to the interviews and to the leadership seminar sessions before transcribing them verbatim. A thematic analysis was used to examine the data from the two diaries and interviews. As suggested by Charmaz (2006), the first stage of the analysis involved the repeated reading of the transcripts followed by line-by-line open coding of data to expose the embedded thoughts, ideas and meanings, and search for patterns. As per Denzin and Lincoln (2003), the identification of common patterns was taken in reference to critical aspects related with the problem under investigation, the predominance of the events, or frequency of participants’ reference to it.

**Trustworthiness**

To provide a more objective account of the study’s findings, the teacher-researcher attempted to deal with the consequences of his presence. As proposed by Cook-Sather (2007), during the process of interpretational analysis, there was an effort for letting students explanations of their experiences shape the researcher’s interpretive frames. This included presenting the interview transcripts to students for checking for accuracy, not only of the words spoken, but also in relation to the interpretations of meanings of what was expressed or
perceived to be implicit in their actions. Second, through regular peer debriefings held between the first author and the co-authors, the research team was involved in a collaborative approach within the interpretational analysis. The goal of these strategies was to ensure interpretative validity while minimizing the risk of individual research bias.

**Results**

**Season One – Basketball: The Baseline**

The results for this season are presented in two phases, due to a change demanded by lesson outcomes in the first part of the season. In essence, this section of the yearlong program could be given the label as a “giving coaches autonomy and then adjust trial”.

From lessons one to six, the coaches were tasked with conducting and monitoring teammates’ game practice (3 vs. 3) and selecting the practice tasks to be introduced in the initial part of each lesson. They were expected to build their instruction upon the information provided during the teacher’s presentation of the game to the whole class in lesson two. They were also given a handbook containing schematic drawings, descriptions of rules, expected movement patterns, and error detection feedback cues related both with the game and a series of game-aligned practice tasks of different complexity.

The evidence collected from this exploratory stage showed that while the coaches demonstrated an ability to provide error detection feedback on simple motor elements presented in the task cards, they struggled to manage, identify problems and provide instruction related with the more complex tactical aspects within game-play. The following extracts provide two examples from the teacher’s field diary:

*During the 3 vs. 3.*

‘Chaos’ is the word here. The coaches had one task, divide the team in two, send them to their courts and start playing the game. Five minutes later, the coaches: panic and lots of stuttering; the teacher: couldn’t believe my eyes; the players: no play. (FD, 20 October)

M. holds the ball stalling the game though although the (space to the) basket is wide open. Peter keeps busy playing is own game and provides no feedback. (FD, 30 October)
Based on the gaps found during the initial stage of the season, the teacher decided it was time to “go back to basics,” and to resume taking the lead during problem-solving activities. During this second stage (lessons seven to fourteen), the teacher deemed there was a need to provide more explicit direction to coaches. Two strategies were introduced: (a) in-task interventions and (b) guided practice.

The in-task interventions attempted to model and thereby promote appropriate error detection feedback. Consequently, the teacher narrowed the scope of the coaches’ intervention by explicitly directing their attention to specific constraints in the tasks related to less complex motor execution components. Guided practice was used for modeling specific tactical solutions to students’ game problems. The teacher combined direct instruction and explanatory information to show how the particular tactical skills fit the specific tactical problems hindering their game-play. The coaches were included in the demonstrations to direct their attention to the critical elements in the tasks. Consider the following scenario during the presentation of the 3 vs. 1 game:

Teacher: In the last lesson the off-the-ball players were great; they’re getting to the spots before their markers. Even so, the defense was tackling the ball because your timing was not the best. You need to keep the ball in ‘pocket’ before they start supporting. Stop dribbling, hold, only then you call for the move. Chris, do it with me: wait, cut now, go. (LO, 28 November).

Perhaps the most common of these was encouraging coaches to adjust task conditions to fit students’ ability level.

Teacher: Each team will need to adjust the rules internally. C. for example will be granted ‘cold’ defense. As she’s not very experienced, for now, the defense cannot intercept her dribbling. Rose (higher-skilled), will be under ‘hot’ defense. To develop her game, she’ll need to use protection dribbling and jump shooting, more sophisticated moves. (LO, 21 November)

There was evidence that during the second stage of the season that the coaches remained highly dependent on the teacher’s support. The in-task interventions, for example,
helped to focus the coaches’ attention towards errors related with specific content elements in the tasks and solve on-the-spot problems. It did not however, enable them to respond autonomously to new situations:

Teacher: When I showed you C. was not cutting properly…
Rose: It helped because I saw it and was more aware. I explained and she was more in game.
Teacher: It helped them. But did it help you to get to do it by yourself?
Rose: Not that. It was just too much stuff to bear in mind. One couldn’t remember it all. (FG-Kangaroos, 13 December)

This trend was also noticed in relation to particular instructional strategies modeled by the teacher. The coaches experienced difficulty in recalling example strategies of how to respond to new situations, as shown in the following example of task modification for assuring developmentally appropriate activities:

The 1 vs. 1 duels Chris selected are suitable to only the higher-skilled players. Some girls spent the task turning their back to the basket and didn’t shoot at all. He could have solved it using the ‘cold’/‘warm’ adjustments to defensive pressure I made to the 3 vs. 3. (LO, 5 December)

Season Two – Handball: Thriving as Problem-Solvers

During season one, although highly dependent on the teacher’s support, the coaches began to understand the responsibility implicit in their role, which was the need to take a more active role in identifying their teams’ problems and acting on them. The central purpose of the intervention in Handball was to advance the coaches’ autonomy in conducting problem-solving activities. The intervention acted on two fronts. The first of these was to develop the coaches’ understanding of the sport (rather than reproducing the teacher’s solutions). The second was to enhance the ability of the coaches to conduct constructivist instruction by engaging teammates actively in the discovery of solutions to teams’ problems. Specifically, the intervention consisted of the introduction of “guided observation,” during the leadership seminars, which involved engaging the coaches in video observation, analysis, and discussion of images of critical class events.
Based on the predominant tactical problems hindering the three teams’ game-play, the teacher created particular scenarios and used guided observation to elicit the coaches’ discovery of specific tactical problems. Framed essentially as “what is going wrong here” scenarios, the teacher used questioning and hints to fill in what he saw as current gaps in the coaches’ knowledge. Rather than offering solutions to coaches, the teacher promoted them to work towards collaborative construction of tactical solutions to the problem-solving scenarios. He used question prompts to provoke an elaboration of ideas in order to encourage the coaches to consider a wider range of alternatives and thus build more comprehensive solutions to problems. The following example shows how most of these scenarios were guided towards helping the coaches to anticipate events and recognize relevant information cues embedded in the tactical problems:

Teacher: How can we counteract this (pass from inappropriate distance)?
Silence…
Teacher: Peter, can you aid the guys here?
Peter: It’s too risky to pass from side-lane to side-lane. I’m explaining this to my team.
Chris: Yeah. I noticed B. does that a lot. Still, if one (defender) is overtaken…
Peter: You cannot have one forward and another backwards.
Teacher: Chris, can you explain it better?
Chris: If he’s holding the ball in the center-lane and makes a pass to the side-lane.
Peter: Ah! In the sense he gets a player closer to him (covering). (LS, 16 January)

The intervention also focused on an attempt to improve the quality of the instructional interactions between coaches and teammates. Two key instructional strategies were adopted. The first of these was the use of questioning for stimulating teammates’ comprehension of concepts. Here the teacher not only modeled the question-asking process, but also provided opportunities for the coaches to practice asking questions. The second strategy adopted was to provide guidance to the coaches on how to prompt teammates to use previous solutions and knowledge to solve current tactical problems:

Teacher: How could you go back to Basketball and get something that helped understand what they were doing wrong?
Rose: That thing of stopping and waiting for support?
Teacher: Hum… every time you made that initial give-and-go, what got open?

Several: Space near the basket.

Teacher: It’s the same thing here (Handball) every time you run that give-and-go.

Use their knowledge from Basketball, “remember Basketball when the defense left the space on their back?” or recruit your own knowledge, for example from (community-based) Soccer, “the faults are alike now, the game restarts at the exact spot”.

Rose: We can get those things they did great so that they remember. (LS, 23 January)

As a result of these interventions, the three coaches showed increases in their ability to identify tactical problems and modeling teammates’ responses in situations related to the aspects debated in the LS. One strategy commonly used was simplified questioning where they encouraged teammates to recall previously learned tactical skills to solve current game situations:

* A. tries to make a long-distance pass; the ball gets intercepted. Peter stops the game...

Peter: What are our two main plays? J., tell me one.

J.: The goalies pass and cut fast and wide open.

Peter: But now you needed to have used the other one. Pass to the center player. I pass to D. (makes a pass-and-overlap), D. passes to A. and A. passes to me again.

(LO, 18 January)

Nonetheless, the three coaches either interpreted differently or had different abilities (or perhaps willingness) to follow the teacher’s intention of stimulating the engagement of their peers proactively in the discovery of solutions to problems. For example, Peter and Rose provided a narrower scope for teammates exploring alternative solutions to their problems, taking what could best be described as a “they learn best if you just tell them what to do” approach. In contrast, Chris tried to nurture a context that encouraged interaction and cooperation between teammates to explore solutions to problems. In noting that “I like knowing what they think as they may be thinking differently and then things will not come out as I expected”, he would then stimulate comprehension of the appropriateness of the tactical solutions during team practice:

Chris: Stop. Everybody, get back to position. Can the off-the-ball guys stand too far?

B.: No.
Chris: Why?
H.: The defender gets there first than the attacker.
Chris: Exactly. So, C. are you at a good spot? Wouldn’t it be better be if, hum…
R. (steps in to help): She was covering both of you (off-the-ball teammates).
B. (takes two steps to the side showing a better spot to receive the ball). If you stand
here he will not reach and intercept. (LO, 25 January)

Season Three – Soccer: Supporting the Coaches in ‘Thinking the Process Over’

During season two, the coaches struggled to cope with situations not related to those explicitly addressed in the LS. Additionally, Peter and Rose had not yet fully grasped the importance of leading instruction in ways that would engage teammates more actively in the construction of knowledge. The central purpose in Soccer was to handover substantial responsibility to the coaches for the conduct of the learning activities (e.g., pacing, content selection, engagement patterns, etc.) and problem-solving processes. On one hand, the learning content addressed was generated from the tactical problems and solutions identified by coaches themselves. On the other, the development of reasoning and argumentation skills and reflection sought coaches’ self-assistance in the monitoring of the effects of their decision-making.

Group discussions were added to the teacher’s strategies to further scaffold of coaches’ instructional abilities. In this season, rather than relying on video analysis used during the Handball season, he instead used stimulus questions to elicit explanations and to prompt the coaches to justify their decision-making. No explicit procedural guidance was given. Rather, the teacher steered the debates in ways that stimulated coaches to challenge each other’s thinking, construct arguments, and support individual options through justifications. The main goal here was to help the coaches to reflect upon the potential links between the processes used (e.g., style of instruction) and players’ autonomy in game-play decision-making:

The Soccer season saw the coaches take over full ownership and commitment for getting their teams ready for the demands of the season. Two notable outcomes accompanied this increased in authority. The first was a growing commitment from the coaches to engage
their teammates in the discovery of concepts and solutions to problems. For example, during Soccer, both Rose and Peter seemed to begin to grasp the importance of developing a comprehension of game concepts, something they were reticent to attempt during Handball. In this third season they were able to engage teammates cognitively in the analysis of game settings and active search of solutions to problems. In addition, there was evidence that the coaches were able to differentiate when a quick piece of feedback was necessary from cases where they needed to stop play and demonstrate a particular tactic using questioning. Chris in particular, was adept at this.

Chris freezes the game and takes a few minutes conducting questioning.

Chris: Is that a good spot to receive the ball? How many passing lanes did B. have?

Moments later a different error emerges. He gives quick instruction not cutting the pace.

Chris: You cannot stay too close, but you cannot stay too far either. Adjust it.

Between game breaks, he gathers the team and scaffolds upon prior knowledge.

Chris: The player in the center, attack the goal. Like you did in Handball. (LO, 1 March)

Season Four – Volleyball: Toward Empowering Teammates

Given the emergence in Soccer of a level of “coach-centeredness” through the use of peer-teaching responsibilities, the intervention in Volleyball was specifically targeted to teach coaches about possible ways for spreading that responsibility among teammates. The main goal of the teacher’s intervention was conducted during pre-lesson briefings conducted in the gym. The teacher built upon the coaches’ emerging knowledge of teammates’ strengths and weaknesses to suggest possible means for involving teammates in self-monitoring. Peter and Chris in particular were able to use several strategies that provided breadth for teammates having an active role in the construction of knowledge. Further, their instruction began to involve strategies for holding teammates’ accountable for monitoring their own engagement in the process.
During focus group interviews, several students corroborated this increasing commitment to peer-teaching responsibilities. Moreover, they seemed to have captured and applied some of less directive styles of instruction used by their leaders.

D.: In those exercises, W. and myself were at the center and A. and J. at the net. Next we placed them at the center too so that they could get another view of the game. J.: W. told me to experiment once at the net and then at center to see where I felt more comfortable playing. (FG-Eagles, 23 May)

Discussion

This study had two essential purposes. The first was to empower coaches as instructional leaders in the conduct of problem-solving processes. The second, which was reliant on successful achievement of the first, was to develop these coaches’ capacity and commitment to conduct peer interactions that would engage teammates in active participation in the construction of learning experiences. The evidence from the year-long intervention which attempted to realize these goals showed that each facet of the program was supported through a series of overlapping, interrelated, and iterative steps of scaffolding means and processes that were differently, continuously, and contingently shaped by the teacher.

The development of the coaches’ ability to conduct problem-solving activities included two main steps. The first concern centered on identifying tactical problems and development of appropriate tactical solutions. The second aimed at developing reasoning, argumentation skills and coaches’ ability to self-monitoring of own decision-making and instruction processes. The promotion of student-centered peer interactions was also a highly demanding multi-phased process that spanned across seasons two to four. Coaches’ active involvement of teammates in analysis and discovery-based activities was noticed mainly from the third season, while student engagement in, and assuming of, peer-teaching responsibilities and active self-monitoring of learning progressions was mostly tangible in the last season of the school year.
The findings of the first season, Basketball, showed that student participation in problem-solving learning activities related to higher order content was only achievable through the teacher’s pronounced intervention. Consistent with prior research (Wallhead & O’Sullivan, 2007) the use of task cards as the main supporting strategies enabled the coaches to only provide error diagnosis and offer lower level solutions to ineffective practice involving simple motor execution elements in the tasks. These findings echoed certain contentions from studies on Sport Education that advocate for provision to participants of higher direction at early stages of learning (Siedentop et al., 2011). As a point in case, in this study, the use of in-task interventions and guided practice was essential in providing a visual model as a reference for the coaches’ diagnosis of critical errors in the tasks. An emphasis on procedural guidance proved to be more efficient than elaboration questions in the early stages of problem-solving for the reason that students seemed to lack sufficient prior knowledge upon which the teacher was able to scaffold upon. However, the findings do not give credence to the speculation of Wallhead and O’Sullivan (2007) that the use of guided practice may somehow compensate for potential deficits in the coaches’ content and pedagogical knowledge. In fact, the coaches were inefficient in transporting knowledge related to problem representation procedures or use of particular instructional strategies modeled by the teacher to respond to new situations emerging from the practice context.

The second season, Handball, represented a critical keystone toward the achievement of the study’s goals. Based on the exploration of particular problem scenarios designed by the teacher, the intervention had two focuses. The first of these related specifically to domain-specific content, and involved attempts to improve the coaches’ problem representation and solution development processes. The second centered on the structuring of the interactions between coaches and teammates interactions, and involved the coaches learning about specific student-centered instructional strategies.
The evidence showed an increasing ability of the coaches to identify emerging tactical problems hindering their teammates’ game-play. Although their instruction was predominantly related to the content covered during the problem-solving video observation sessions, they were still able to provide appropriate error detection feedback related with higher order content within the practice context, even when not preceded by direct support from the teacher in the gym. The coaches showed higher versatility as they identified similar problematic situations in different contexts ranging from game practice to competition matches while modeling specific solutions to teammates’ game problems. The teachers’ shift to using discovery-based instruction during the analysis of game problem scenarios (recognizing key information cues, analyzing critical constraints in the situation) seems to have been highly beneficial. Prior research has found that when stimulated through elaboration questions, students develop to be more active in taking deliberate efforts to identify and seek relevant information in the problems (Xun & Land, 2004). In this case, the development of coaches’ comprehension of concepts, and ability to the scenarios to find relevant features in the situations, was likely a more suitable strategy (than direct instruction used in the previous season) to cope with the open and dynamic nature of the tactical problems in team sports (Farias, Mesquita, & Hastie, 2015).

Also in the second season, the coaches were able to implement specific instructional strategies modeled during the problem-solving debates. Two aspects may explain this. The considerable efforts undertaken by the teacher to build the scaffolding upon coaches’ own ongoing instructional experiences, and his guidance that showed coaches how to establish links between current situations and their own knowledge base and prior experiences. Xun and Land (2004) found that such processes help students activate prior knowledge to solve new situations that preserve similar features in an independent manner. It was also evident that the strategy first adopted by the coaches was the use of simplified questioning to stimulate
teammates to recall prior learning experiences to solve emergent game situations. This confirms findings of previous research. It has been stressed that explicitly engaging instructional leaders in processes such as question-asking is an indispensable condition so that they are able to engage peers analysis and problem-solving tasks (Ward & Lee, 2005).

The third cycle of the intervention, Soccer, sought a handover to coaches of increased responsibility for the conduct of problem-solving activities. The intervention centered on developing coaches’ reasoning and argumentation skills and self-critical evaluation of the procedures used in their planning and conduct of team-practice activities. The interplay between scaffolding, fading of the support and handover of responsibility was particularly noticed in Soccer. The mastery of critical problem-solving processes (i.e., the ability to identify problems and select appropriate solutions to solve them) exhibited by the coaches from the early lessons of the season allowed reducing the degree of the scaffolding support considerably. On one hand, it made possible to plan the learning activities upon problems identified and brought up to discussion by coaches themselves. On the other, there was no need to revert back to the use of more direct instruction such as modeling in aspects related with domain-specific content (Xun & Land, 2004). The teacher found the scope necessary for introducing less directive reflection prompts that engaged coaches in high-level discourse such as making claims about possible effects of events and warrant those back with arguments and justifications (King, 1992).

Soccer saw an increasingly ability (and self-determined willingness) of coaches to regularly engage teammates in the analysis of problem settings and discovery of solutions. This may signify that instructional strategies such as simplified questioning are difficult to be learned by students, as it was only from the third season that coaches grasped the process more accurately. More importantly, it stresses the importance of developing students’ reflection skills. It was only after the coaches being stimulated to reflect on the impact of their
instruction on teammates’ achievements that they committed more thoroughly to relinquish more directive styles and adhered to more ‘constructivist-oriented’ instruction.

Despite the advances found in Soccer, the peer-teaching and cooperative learning initiatives were found to be unintentionally over-concentrated in the coaches and few other higher-skilled players of their trust. This corroborates finding of prior research suggesting that self-determined peer-teaching behaviors are particularly difficult to develop in students (Farias, Hastie, & Mesquita, 2015), particularly in the case of this study where children had no prior experiences with cooperative learning dynamics. In the current study, the spreading of peer-teaching initiatives needed to be explicitly stimulated at the entry of the fourth intervention cycle both at an instructional level and at a structural level. Firstly, the coaches needed explicit guidance on strategies suitable to stimulate peer-teaching. Secondly, the nature of the sport, Volleyball (which encourages cooperative game-play) and the structure of the learning activities (e.g., 2 to 2 practice), both concurred to sharing of knowledge between the playing partners.

As had occurred in Soccer, in Volleyball evidence from early lessons presenting coaches’ mastery of problem identification and awareness on the need to adjust organizational procedures to the features of the new sport, allowed the use of less directive support (elaboration prompts). However, in opposition to Soccer where most students were knowledgeable and culturally attuned to the sport, these students had no prior experience with Volleyball. This lends credit to research and literature advocating that metacognitive development can compensate to some extent an absence of relevant domain-specific knowledge (King, 1992). It also stresses the key value of focusing the scaffolding strategies on students’ development of higher-order cognitive skills as a means for empowerment and self-assistance. A particularly noticeable finding in season four was the coaches’ ability to recall, adapt, an implement by their own means instructional processes modeled by the teacher in
previous seasons to solve current problems. Peter, for example, used guide practice (a process used by the teacher in the first season) for handing over responsibility to teammates to conduct their own learning activities. More than internalizing the scaffolding structure offered by the teacher and reproduce it in a straightforward matter, the coaches seemed to have seized the essence of the process, a development also acknowledge by Smit et al. (2012). This allowed them to adjust the type of instruction and the organization of the learning activities in light of the nature of the new game, which saw teams simultaneously spread over numerous courts.

**Conclusions**

This study showed that it is possible to engage students in effective higher order thinking processes and problem-solving activities within a pedagogical structure driven largely by peer-led instructional interactions. However, the study also showed that without specific coaching preparation to conduct instruction congruent with constructivist pedagogies, it is highly unlikely that the ‘guide on the side’ strategy, or simply placing students in teams, will by themselves ensure the active involvement of students in general in the discovery and building their of own learning experiences. To be highlighted is the fact that the scaffolding processes used by the teacher in Sport Education to stimulate development of coaches’ problem-solving skills involved a highly complex, and far from linear, process. It was not a question of simple gradual withdrawing and replacement of procedural guidance with discovery-based strategies. Rather, the scaffolding was shown to be a dynamic process highly influenced by an interplay of factors such as the nature of the domain-specific knowledge, coaches’ and teammates’ ongoing responses, the progress on cognitive and meta-cognitive skills, and students’ prior experiences and conceptions of teaching and learning. In this case, the action research methodology was critical for allowing to keep pace with the ever changing knowledge and relational development, while also permitting to act in useful time upon the process itself toward improved teaching and learning.
References


<table>
<thead>
<tr>
<th>Season</th>
<th>Goals</th>
<th>Game form</th>
<th>Practice tasks</th>
<th>Content</th>
<th>Tactical principles</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball</td>
<td>Developing game appreciation</td>
<td>Single-basket 3 vs. 3 played on a half-court</td>
<td>Skills-drills 2 vs. 0 1 vs. 1</td>
<td>Dribbling Chest pass, Shooting Defense</td>
<td>Scoring</td>
<td>Coaches</td>
</tr>
<tr>
<td>19 lessons (45 mins)</td>
<td>Mastering a given program of actions (what, how, and why to do)</td>
<td></td>
<td></td>
<td></td>
<td>Attack the basket</td>
<td>Coaches</td>
</tr>
<tr>
<td>Handball</td>
<td>Developing awareness on predominant configurations of play and adaptation to game conditions (why to do)</td>
<td>3 vs. 2 + goalkeeper Court: 20m x 15m with restrictive goal area</td>
<td>4 vs 4 2 vs 1 3 vs 1</td>
<td>Zone defense Pass-and-overlap Progressing to goal, fixing the defender, passing to open player</td>
<td>Defending space</td>
<td>Teacher</td>
</tr>
<tr>
<td>12 lessons (45 mins)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Creating/ using space in the attack</td>
<td>Coaches</td>
</tr>
<tr>
<td>Soccer</td>
<td>Recognizing tactical principles across games in the same category</td>
<td>3 vs. 2 + goalkeeper Court: 20m x 15m, no restrictive</td>
<td>3 vs. 1 3 vs. 2</td>
<td>Progressing, fixing the defender, passing to open player Width/depth, Keep open lane,</td>
<td>Creating/ using space in the attack</td>
<td>Coaches</td>
</tr>
<tr>
<td>16 lessons (45 mins)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Shared Teacher/coaches</td>
</tr>
<tr>
<td>Goal Area</td>
<td>Defensive Cover</td>
<td>Offensive Cover</td>
<td>Coaches</td>
<td></td>
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<tr>
<td>var. 1 - interception allowed only in defensive zone; 2 - interception allowed all court</td>
<td>Maintain ball possession</td>
<td>Fast control and shooting</td>
<td>Coaches</td>
<td></td>
<td></td>
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<tr>
<td>2 vs. GK 3 vs. 0</td>
<td>Attacking the goal and scoring</td>
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<td></td>
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</tr>
<tr>
<td>Volleyball Recognizing tactical principles across games in different categories</td>
<td>1 vs. 1 (coop. then competitive)</td>
<td>Read and anticipate, Base position, Overhead pass, Serve, Using depth/width</td>
<td>Coaches</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>21 lessons (45 mins)</td>
<td>2 vs. 2 (coop. then competitive)</td>
<td>Read and anticipate, Base, Underhand pass, Passer-setter communication/coordination, Passer-set-attack, Passer to setter transition</td>
<td>Shared Teacher/coaches</td>
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<tr>
<td>1 vs. 1</td>
<td>Defending space</td>
<td>Setting up the attack</td>
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<tr>
<td>2 vs. 2</td>
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</tbody>
</table>
## TABLE 2

Year-long Syllabus of the Teacher’s Scaffolding Processes

<table>
<thead>
<tr>
<th>Season</th>
<th>Intervention Focus</th>
<th>Context</th>
<th>Strategy</th>
<th>Instructional Strategies for Mediation of Coaches’ Instruction</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Diagnosing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>‘Giving coaches autonomy and then adjust’ trial’</td>
<td>Gym</td>
<td>task cards</td>
<td>handbook containing schematic drawings, description of rules, expected movement patterns, and error detection feedback cue related both with the game and a series of game-aligned practice tasks of different complexity.</td>
<td>indirect teaching</td>
</tr>
</tbody>
</table>
| Basketball | Develop basic instructional skills:  
1. repeat teacher’s instruction/error detection  
2. feedback/strategies | Gym     | guided practice | short demonstrations of the upcoming tasks conducted by the teacher to the entire class prior to the coaches establishing and replicating the tasks within their own teams | modeling/explaining: tactical movements/solutions to game problems instructional procedures (error detection feedback, game modifications) |
|         |                                                                                   |         |               |                                                                                                                                  |                                            |
|         |                                                                                   | Gym     | task cards     | as above                                                                                                                        | indirect teaching                          |
| Handball | Develop:  
1. ability to identify tactical problems & appropriate solutions  
2. conduct of problem-solving instructional interactions | LS (outside the gym) | guided observation | video observation, analysis, and debate about video images of the teams’ gameplay/coaches’ conduct of instructional interactions | questioning: discovery of tactical problems co-construction by coaches of tactical solutions questioning/modeling/explaining strategies: freezing-and-rehearsal question-asking building new content upon prior learning |
<table>
<thead>
<tr>
<th>Season</th>
<th>Intervention Focus</th>
<th>Context</th>
<th>Strategy</th>
<th>Description</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soccer</td>
<td>Diagnosing 1. developmentally appropriate practice 2. critical thinking and argumentation 3. teammates’ gameplay decision-making</td>
<td>Gym</td>
<td>task cards</td>
<td>as above</td>
<td>indirect teaching</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>reflective debates about issues raised by coaches/teammates/teacher without video observation support</td>
<td>questioning for developing: reasoning and argumentation skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LS/</td>
<td>group discussions</td>
<td>team debates</td>
<td>critical evaluation of impact of individual instructional processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>team-</td>
<td></td>
<td>coach debates</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>meetings (outside the gym)</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Gym</td>
<td>pre-lesson briefings</td>
<td>personalized tutorial sessions to coaches for planning the upcoming learning activities</td>
<td>questioning/modeling/explaining strategies for: extending peer-teaching responsibilities to teammates stimulate teammates’ self-monitoring</td>
</tr>
</tbody>
</table>