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Continuing Professional Development with Cooperative Learning in a Professional Learning Group

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Abstract

Cooperative learning is a dynamic pedagogical model that can teach varied content to a diverse range of students. Students work together in small, structured heterogeneous groups to complete tasks. The purpose of this paper is to explore teachers' experiences with Cooperative Learning during a school-based research project. This research was also designed to gain a greater understanding of Continuing Professional Development within a Professional Learning Group that has the potential to enhance the quality of a physical education (PE) program with non-PE specialist elementary teachers. This research suggests that the implementation of Cooperative Learning or any innovative models-based practice in schools is enhanced by continuing Professional Development. Teachers' implementation of Cooperative Learning was assisted by teachers in this study by being part of a Professional Learning Group to help them reflect, identify, and start to overcome some of the obstacles that arise when implementing a new pedagogical model.

Keywords: cooperative learning, physical education, professional learning groups

1. Introduction

Cooperative Learning is working, like learning new things with your group and if you're stuck they will help you and there's lots of encouraging and praising... It helps in other subjects because whenever we need help in any of the subjects we know that someone will help us. (Grade 5 student).

Cooperative learning (CL) is a dynamic instructional or pedagogical model that can be used to teach varied content to a diverse range of students [1]. In this model, students work together in

structured, small, heterogeneous groups to engage with subject-matter content. More than 1200 research studies have been conducted in the past two decades alone on cooperative, competitive, and individualistic learning in general education [2]; however, the impact on physical education (PE) has been much less [1]. Although less research on CL have been conducted in PE than in general education, existing studies have found that this instructional model can enhance students' PE and physical activity experiences [1, 3, 4]. Within the wider literature around CL [2, 5–8]), and within the literature on CL in PE [1, 9], five elements are considered critical to CL: (1) positive interdependence; (2) individual accountability; (3) promotive face-to-face interaction; (4) interpersonal skills and small group skills and (5) group processing (for details, please see [10]).

The intention of this article is to present teachers with a school-based research project that is less complicated to understand. A great deal of research presented in the major PE journals (*QUEST, Journal of Teaching in Physical Education, Research Quarterly for Exercise and Sport Science*) is written in complicated, research jargon. The writers, a university academic (concealed) and a PE teacher (concealed), believe that this school-based research can be valuable for teachers. The writers consider that new ideas and concepts like CL can be better understood and appreciated by teachers if this knowledge is made more easily available to them; the writers also believe that Continuing Professional Development within a Professional Learning Group can enhance the quality of a PE program.

1.1. Theory connected to practice

The common learning theory of social constructivism is grounded in research and practice [11, 12]. More recently, Barker et al. [13] have promoted social interactions emphasizing the need for small group and interpersonal skills in PE. The version of CL promoted in this article was developed from social constructivist theories of learning [9, 14, 15]. Social constructivism offers a practical and appropriate theoretical framework for school-based research and practice [12, 16, 17]. This chapter attempts to connect the social constructivist theory to the practice of teaching PE and hopefully move toward bridging the theory-practice gap.

Cooperative Learning has been integrated into a Tactical Games Approach or a game-centered perspective both theoretically [14] and practically [18]. Because the integration of Cooperative Learning and Tactical Games is a complex and labor-intensive process, teachers will take some time to feel comfortable with teaching Cooperative Learning or Tactical Games or a combination of the two pedagogical models.

1.2. The purpose of this work in schools

The purpose of this school-based research was to investigate the challenges that generalist classroom elementary teachers faced when implementing the CL pedagogy model into their PE classes. Non-PE specialist elementary teachers were part of the school-based, teacher-driven CL Professional Learning Group. One of the current gaps in the literature is school-based collaborative research of CL as an instructional or pedagogical model [1].

This research project involved the co-construction of CL with teachers within their schools as professional development (PD). PE research suggests that PD needs to be school-based and focused on the day-to-day realities found in the context of the specific school's PE program [19–21]. O'Sullivan and Deglau [20] found teachers wished to gain specific, practical and concrete ideas relating to the daily practices in their classes. Coulter and Woods [18] concluded that "PE-PD should be contextualized and take place in school contexts with children present" (p. 340). Physical education PD programs need to be individualized to the teachers' specific needs as physical educators and engage them with key skills that are relative to content [21, 22].

For physical educators, learning takes place in the complex interactive social world within transforming and changing interpersonal relationships [23]. However, any meaningful change in teaching requires a conceptual shift in the way a teacher presents instruction [1, 24]. Fullan [25] argued that change does not have a blueprint, is not linear, and is loaded with uncertainty. Innovation of a new instructional model or pedagogical practice is problematic at best.

2. Methods

This research used a case study design [26] to explore PE teachers' use of CL as a pedagogical model in four schools. The study utilized a multiple-methods approach based on qualitative research [27]. The researchers engaged in Continuing PD sessions at a university and at schools over a 1-year period involving multiple meetings, emails, discussion, and observations at schools. By working as part of a collaborative research team (the CL Professional Learning Group), university academics, and teachers co-constructed CL curricula in school-based PE programs. This was collaboration *with*, not *on*, teachers.

2.1. Data sources

Participants were 12 teachers from four elementary schools from a wide range of ethnic, cultural, and socio-economic backgrounds. The participants shared their individual experiences through frequent meetings and interviews. Evidence was gathered from teacher post-lesson reflections, a researcher journal, field notes, and documents (such as lesson plans, school PE programs, and meeting transcripts). In addition, the 12 teachers were interviewed at the beginning of the study and at the end of units (an average of four 50-min interviews per teacher). One researcher was assigned as a school connection or *critical friend* to each school; therefore, informal interviews also occurred with each teacher. Each school was visited a minimum of six times during the study.

2.2. Data analysis

Inductive analysis and the constant comparison method were used to analyze these qualitative data [27]. Data analysis involved the inferential coding of these initial descriptions [27]. This was undertaken with the aim of challenging the interpretations of the findings, identifying

conceptual links, and uncovering key categories through frequently challenging the interpretations in peer debriefing sessions with teachers and university faculty and graduate students.

3. Findings

There were some interesting findings from this study, and these are represented in three categories drawn from the data: *Students not possessing needed social skills*; *Teachers' understanding of cooperative learning*; and *Changing pedagogy to a student focus*.

3.1. Students not possessing needed social skills

Teachers talked about students' lack of the social skills needed for CL. You might relate to this in your PE program. One teacher suggested during the group discussion: "Social skills is top [challenge to CL implementation] definitely—social skills of [students] not wanting to work with that person." The teachers talked about the importance of building social skills from a holistic perspective and referred to the three domains of learning: psychomotor, cognitive, and affective domains of learning.

Teachers in one school identified the following social skills as areas of focus in order for CL to be successful: (1) specific feedback, (2) active listening, and (3) teamwork. For example, one teacher's emphasis on specific feedback helped during the skill practice portion of the lesson. During this teacher's lessons, students were observed giving specific feedback concerning their group member's performance of a skill: "You jumped really far because you used your arms. Nice!" Teachers often commented that they wanted to include all students in the development of social skills and social learning.

3.2. Teachers' understanding of cooperative learning

Although some of the teachers had prior experience implementing CL in their classrooms, none of these generalist classroom teachers used CL in the PE context. The limited level of understanding of PE and CL led to two main challenges: (1) Comprehension of CL structures and (2) level of comfort using CL. At the beginning of the year, several teachers expressed concern that their students were not easily learning the CL structures.

One teacher commented:

I thought of CL [as] being very structured and very 'you do it this way and this way'. But I've realised it's a lot of things we already do that involve CL, but we didn't call it that. So it's Think-Pair-Share, which I've done for years, is part of that, but I didn't make the connection that it was.

At the end of the year, this teacher reflected that one of the challenges of implementation was individual accountability. The CL structures need to engage all the team members and that, to be successful as a group, all the kids need to take an active part.

3.3. Changing pedagogy to a student focus

Teachers in the four schools believed that CL enabled them to move toward being more student-centered in their lessons, which facilitated students taking more responsibility in a supportive and encouraging environment. Teachers saw students interacting with and teaching each other, not just individually or just with their teacher. A teacher noted “If a problem arises with whatever they’re doing and they learn strategies in how to solve that problem,” then students take more responsibility for their own learning.

With CL as an instructional model, teachers were able to develop tasks that enabled students to take more ownership. Teachers were able to withdraw themselves from instructing and were able to critically observe what was occurring in their classes. One Assistant Principal talked about how teachers changing their instructions seem to help students to take ownership: “[students] are taking more ownership for what they’re doing and taking it a bit more seriously and taking their responsibilities more seriously.” In CL, the teacher takes on the role: facilitator of learning and thus shifts their role from director of instruction to a more student-centered approach to teaching. Learning to be a facilitator is more complicated for the teacher. They need to learn to guide their students and not control everything that happens in their lesson. One teacher expressed her concerns for students comprehending all the changes that were required in a CL task. Also, teachers talked about the challenges of students taking on different roles (e.g., coach, recorder or encourager, etc.) in their PE classes. The research findings suggest one way to get students to be more a part of the PE program was for teachers to use CL structures.

3.4. Cooperative learning structures

CL structures are an integral part of using CL as a pedagogical practice. CL structures can be defined as the method of teaching that utilizes strategies for the organization of content and social interaction of students in a classroom or educational setting [28]. The specific, step-by-step procedures of CL structures are used to present, practice, and assess content—some enhance interactions between pairs, whereas others are designed for small-group work, and others for larger groups [10]. Our research [9] suggests that small groups of 3–5 students produce the most reliable results when using CL structures. An example of a simple but effective CL structure is that of *Tip, Tip, Coach*. Many teachers already use this CL structure with their students (**Box 1**).

A second example of a less complicated but productive, CL structure is *Numbered Heads Together*. Many teachers might already be using this structure with their students. This is a modification of Kagan’s [28] *Numbered Heads Together* CL structure. Considering the diverse range of students in the class the teacher poses a problem: “What are the different ways you as a group can get the volleyball from point A to point B?” Each student thinks of a response. Then the teammates literally, and physically, put their heads together to reach consensus to answer the question. The teacher varies the time allocated for this task depending on the needs of the students and the complexity of the task. To think about and answer the question, students put their heads together in their group while sharing answers, and discussing.

Students use pre-arranged signal to indicate when everyone knows the group responses. The teacher calls two numbers, and the students who have these numbers assigned to them in the group answer the question together. There are several ways students might respond: a physical demonstration, thumbs up, thumbs down, response cards, white-board responses, or through an explanation. Choosing two students to respond caters for a student who is struggling to answer—this exemplifies one of the supportive elements inherent in cooperative learning. Yes, we want to hold students individually accountable for their contribution, but this is “sink or swim together,” and therefore, the group members are always there to offer help and support other group members. The groups should be encouraged to suggest learning cues that their group members need to practice to be able to perform in a game.

There is an alternative format for this scenario: *Numbered Heads Together Perform*. For instance, in a practical example where the students are practicing the different passes in volleyball there are some basic mistakes being made. During the practice task, the ball may be not going toward the target. That is, the teacher notices a common error related to the learning cues of passing in volleyball: the students are not square on to the target. The teacher might pose a question: for example: “How do we solve this problem?” The answer generated by the student team should help the students to perform better and might be as simple as students saying they need to stay “square to the target.” The final act is where all students perform their suggested answer to the teacher’s question.

There are many variations on *Numbered Heads Together Perform*. The general concept is that the teacher poses a problem. The students independently and quietly consider a solution, join their team members in a group and communicate or discuss their answers together. Then the whole group must reach a consensus about the answer (which creates opportunities to develop small group and interpersonal skills and engage in promotive face-to-face interactions). At that time, the students indicate that they are ready to answer the question. This strategy is similar to the CL Strategy, *Think, Share, Perform* but, in *Numbered Heads Together* students are numbered off in order to hold each student accountable. The teacher calls a random number or two numbers and every member of the group must be ready to answer the question. In Outdoor Education, Coaching or PE examples could include creating: your own game/s, dances, or your own obstacle courses. This structure encourages problem solving for practical games and sport strategies.

A third example of a more complex CL structure is *Pairs-Check-Perform*. Many physical educators already use this structure with students (see **Box 2**). There have been several modifications to *Pairs-Check-Perform* over the last 15 years. One version, below, emphasizes individual accountability. The writers observe that *Pairs-Check-Perform* has also been used by several teachers as a peer-assessment strategy. Below is an example used by Rachel Colby while teaching at Papatoetoe South School, Auckland, New Zealand.

In the CL structure *Pair-Check-Perform*, students are required to work with each other to perform the task but also to check on their team member’s response to the task. Students work in their Cooperative Group of four students. Rachel uses *Pair-Check-Perform* to focus on her psychomotor learning objectives for guiding students to learn the forearm pass in volleyball

(Box 2). The Task: *Pair-Check-Perform* as an assessment of learning cues for the forearm pass in volleyball: bend knees; flat platform; move to the ball; and body angled toward target. Again the groups should be encouraged to suggest learning cues that their group members need to practice to be able to perform in their version of the game.

By using this approach, Rachel felt that she was able to do a better job of teaching students the forearm pass for volleyball. Rachel noticed that students at the upper elementary level have a huge range in ability in their volleyball skills. She uses *Pair-Check-Perform* to check that her students have learned this skill well enough to play in a modified game with their peers.

Think-Pair-Share is a CL structure that has been used for many years by teachers in schools and by faculty at universities. In PE, we adapt *Think-Pair-Share* to *Think-Pair-Share/Perform*. For example, a teacher's instructions could be: "Think—Think about your favorite dance move"; "Pair—pair up with someone and show them your favorite dance move"; "Share/Perform"—the teacher could invite students to share/perform their favorite dance move with the rest of the class.

4. Concluding comments

There is a substantial amount of research to suggest that CL is a successful instructional model of pedagogical practice [1, 9, 29]. The literature suggests that PE has frequently been taught using a traditional approach [30, 31], one that is teacher-focused and centers on the physical domain and often excludes the social, emotional, and cognitive domains of learning. This research supports the research from Lafont et al. [4] and Barker et al. [13] who have highlighted the need for social skills development. The teachers in this study reported a shift toward an inclusive, student-centered pedagogy, a more socially interdependent program and a corresponding move away from a competitive model of teaching [1, 32]. This research suggests that it is possible for generalist classroom teachers to learn and use CL in PE but it also indicates there are struggles. This process required a great deal of support and continuing PD. Teachers in this study needed guidance from the CL Professional Learning Group to help them reflect, identify, and start to overcome some of the obstacles that arise when implementing a new pedagogical model [22]. The implementation of CL (or any innovative models-based practice) in schools must be done through continuing PD [21]. This research in schools suggests that there is a need for further school-based enquiry to understand effective PD and training that has the potential to overcome some of the challenges and allows teachers to develop quality PE programs [21, 33]. Also, we recommend that PETE programs teach pre-service teachers how to incorporate CL and other models-based practices into the PE curriculum. Furthermore, PETE programs should provide Professional Learning and Development for teachers in schools [29]. CL is a pedagogical model that has the potential to enhance students' PE and physical activity experiences [1]. However, pedagogical change takes time, support, guidance, and critical reflection [10, 14, 25]. While meaningful, purposeful, and quality PE can be a challenge—it is the intention for us all.

A. Appendices

Tip, Tip, Coach can be used in Physical Education, coaching or a classroom setting. Traditionally *Tip, Tip, Coach* involves partners alternating between two roles (coach and player) to be successful with the task or activity. While this traditional version may cater for the needs of the students in your class, the increasing diversity of students in the above settings demands adjustments to traditional CL structures. The following example is offered as an adjusted version of the *Tip, Tip, Coach*.

In this version, four people are in a group who alternate between the roles of players (2), one head coach and one assistant coach in order to improve and to provide support in a task or activity. The addition of the assistant coach not only emulates a sporting team environment but also provides support for a person in the coach role if they require it. Additionally having two players enables tasks or activities that require more than one player such as passing, catching and trapping the ball. Player A has a first attempt at an activity while the head coach and assistant coach are watching. If Player A is unsure or the coaches notice, they need help, the player can ask for a tip. That is, the head coach can give Player A one (coaching) tip (but not give them the answer or do it for them). The player tries again, and can ask for another tip. On the third attempt, the head coach can now start coaching the player to improve their performance. The head coach can consult with the assistant coach before giving a tip or while coaching. After improvement with the task, the coach and assistant coach swap roles and observe Player B. Students swap roles until all students have played every role. Players and coaches will need some guidance. We have found task sheets or task cards with pictures or photos of the task provide useful visual representations of the task. It is also advisable to provide an accurate demonstration of the task before starting the activity. If a student lacks confidence in the coaching role it is advisable that they begin as a player, followed by the assistant coach role before becoming the head coach. This strategy enables the student who lacks confidence to practice with the learning cues many times before having to communicate these to other players.

For example, in the soccer skill of passing two players will be required to pass the ball back and forth to each other. In the traditional version of the structure, there will be one player and one coach times two. In the adjusted version of the structure, there will be the head coach and the assistant coach with the two players. The learning cues for the task are on a task card in both written and pictorial form (photos or pictures). To cater for the diversity in a class, different learning cues may be required for some students. The table below provides some examples of these different learning cues. The example for a student who uses a wheelchair is just one option as in reality each student with a physical disability may require a different approach. Writing the traditional and plain English versions of the learning cues on the same task card provides options for the coaches.

Focusing on one player the coach and assistant coach observe and give feedback, if required as Player A has their first attempt. If this player is unsure or the head coach notices they need help, the player can ask for a tip. That is, the coach can give the player

one tip (use your instep/inside of foot). The player tries again and can ask for another tip (plant non-kicking foot beside the ball). On the third attempt, the head coach can now start coaching the player to improve their passing. After the player passes, using at least three of the four cues, or after a pre-determined time students swap roles.

Traditional	In kid's speak	Student who uses a wheelchair
Use your instep/inside of foot	Put the foot you are not kicking with beside the ball	Place the ball on your lap (could be partner assisted)
Plant the non-kicking foot beside the ball	Use the inside of your foot	Using your hand or fist push the ball forward
Strike the middle of the ball	Kick the middle of the ball	Let your hand and arm follow through
Follow through	Let your leg swing forward	

Box 1. *Tip, Tip, Coach.*

In the *Pair-Check-Perform* CL structure, students are required to work with each other to perform and check information. There are four students in each group.

1. The instructor explains, demonstrates, and checks for understanding of a selected sports skill or teaching skill.
2. Instructor describes student performance outcomes and social, cognitive, and/or physical skills necessary to achieve the goal. We have found providing a task sheet with performance criteria and photos helps remind students what the performance outcomes are. As with *Tip, Tip, Coach*, some students may require adjusted outcomes to ensure the opportunity for improvement and success.
3. The instructor places students in CL groups, divided into two pairs.
4. In each group, one student practices the skill while the other student provides encouragement and helps the other student to perform the skill.
5. When one student has performed the skill, roles are reversed.
6. When students in each pair have performed, they join together with the other pair, in their group of four, and each student from each pair performs. If all students agree that the performance met the criteria for each student, the pairs can move onto the next skill. If there is disagreement, the students must continue working on the performance until they all agree on the form.

Task: For example, assessing the learning cues for the forearm pass in volleyball: Bend knees; Flat platform; Move to the ball; and Square to target.

Box 2. *Pair check perform.*

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