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5th-Graders' Social Interactions in a Student-Designed Games Unit

Students' social interactions in physical education (PE) have been explored in different ways within student-centered models such as Sport Education (SE), Cooperative Learning (CL), and Tactical Games (TG). Within these curriculum models learning tasks occur during group interactions or interpersonal relationships (Butler, 2006; Dyson, Griffin, & Hastie, 2004).

Students' interdependence develops during problem solving tasks that include group strategies, discussions and reflections. For example, one of the principles of SE model is to maximize students' interdependent relationships among tasks in skill development, tactics and strategies, and also during social roles played throughout the unit of instruction (i.e., season), such as being manager, coach/captain, and scorekeeper (Brock, Rovegno & Oliver, 2009).

Cooperative learning is also known for fostering students' social and academic outcomes. In this model, social interactions occur by students working together towards a common goal, accomplishing tasks in small, structured and heterogeneous groups (Dyson, 2005). This approach not only focuses on student learning, but also how students help and share learning experiences with peers (Dyson, 2005). As an element of CL model, positive interdependence occurs when students within groups perceive that they cannot succeed in their tasks unless their peers do too (Casey, Dyson & Campbell, 2009).

In the TG approach learning occurs through self-discovery, exploration, observation and interactions during gameplay and game-related drills (Butler, Storey, Robson, 2014). Students are encouraged to make decisions in small groups with the intent to promote negotiation, questioning, listening and compromising during game-related activities (Butler, 2006). The TG approach focuses in inclusiveness. It takes into account that, students' differences and heterogeneity can lead to improvement of learning (Butler et al., 2014).

Student-Designed Games: A Rising Teaching Approach

Student-Designed Games (SDG) also referred as Child-Designed Games (Rovegno and Bandhauer, 1994) and Inventing Games (Butler, 2016) has gained more popularity in the PE literature. The premise of SDG is to encourage students to work together while designing, refining, and playing their own games based on their ability level (Casey & Hastie, 2011; Hastie, 2010). Positive social interactions, improved social skills, peer acceptance, and cooperation are potential outcomes of students' engagement of collaborative groups (Hastie, 2010). Although SDG has been known since the late 1960's (Mauldon & Redfern, 1969), only in the past few years it has been supported with research findings (André, Hastie & Araújo, 2015; André & Hastie, 2016; Butler, 2013; Casey & Hastie, 2011; Casey, Hastie, & Rovegno, 2011; Hastie & André, 2012; Hastie & Casey, 2010).

In SDG, the role of the teacher is to facilitate active learning experiences. Implementing a SDG unit requires teachers' planning for: (a) outcome goals to be achieved; (b) type of games to be designed; (c) organization of learning groups; (d) challenges to be presented to the groups; (e) time for students to explore options when designing the game; (f) time for students to practice the game; (g) time for students to review the game; and (h) time for students to share the end product to their peers (Hastie, 2010).

Pedagogical Approaches & Potential Behavioral Learning Outcomes

There are multiple ways of approaching SDG teaching. The present study used Hastie and André (2012) which includes: SDG introduction, game design, playing each other's games, refinements and playbook.

The current literature suggests that SDG approach has influenced students' social and emotional learning (Butler et al., 2014). Since its initial conceptualization, SDG has been

claimed for its possibilities to create and improve positive social interactions (Mauldon & Redfern, 1969). Butler and her colleagues (2014) indicates that SDG offers participatory and democratic learning experiences in which students have opportunities to:

- make choices and decisions in order to solve problems and regulate their own behavior;
- consider other's points of view, to compromise and to negotiate conflict constructively;
- make decisions including all members of small groups;
- understand their responsibility to protect individual and collective rights and freedoms (Butler et al., 2014).

However, limited empirical research has supported these claims as direct outcomes from participation in SDG unit. Previous research has identified both positive and negative social interactions while conducting SDG teaching units. Casey and Hastie (2011) have reported that students had a high commitment in including all students during the entire design process, while Rovegno and Bandhauer (1994) have identified negative students' relationships such as arguments and humiliations. Therefore, this study sought to gain a better understanding on students' social interactions during a SDG unit in two ways: (a) through observations during students' engagement during lessons, and (b) through students' perceptions of their participation in the unit. The social competence theoretical framework was used to describe social goals and context-specific tasks involved in this particular SDG unit of instruction.

Students' Social Competence

Rose-Krasnor (1997) suggests a theoretical framework that describes social competence in three levels. The top level is the *Theoretical Level*, which refers to the effectiveness of social

interactions that meet short- and long-term developmental needs. This level identifies four components of social competence: (a) competences that emerge from interactions between people, (b) measures of social competence that are situational and task specific, (c) performances of “typical” interactions, and (d) the meaning of competence in relation to specific goals. The middle level is called *Index Level*, which relates to the distinction of *Self* and *Other Domains* as necessary dimensions to maintain positive social interactions. The bottom or initial level refers to *Skill Level*, which consists of individual’s traits such as motivation and social, emotional and cognitive skills that serve as building blocks for interactions and relationships.

According to Rose-Krasnor’s (1997) the *Theoretical Level* (i.e., top level) is the most appropriate level to examine social competence because it focuses on: (a) social goals and tasks that are context-specific, (b) outcomes of social behaviors, and (c) process of leading to these outcomes. This study is limited to focus on the *Theoretical Level* due to the use of observations and perceptions of students’ social interactions, and also due to context-specific behaviors that emerged during intra- and inter-group relation during a SDG unit.

Method

Setting and Participants

This qualitative research was developed within a case study (Yin, 1994) design that intended to examine fifth-graders social interactions in the context of SDG during PE lessons. Yin (1994) categorizes case studies in three forms: exploratory, descriptive and explanatory. A descriptive design was selected to depict observable behavioral and students’ perceptions of their social interactions during intra and inter group tasks during 11 lessons of SDG-target games unit.

This study was conducted in a public urban school with enrollment of 439 students in the southern area of the United States. Students’ eligibility for free and reduced lunch was 52.9%. In

the initial stages of the unit (Lessons 1-4), students experienced playing games from several categories, the sessions were in outdoor large open fields, including a tennis court. The remaining sessions (Lesson 5-11) took in a 60 by 40 feet gymnasium.

The participants were 27 students, 16 girls and 11 boys (ages 10-11 years). They received PE classes twice a week. Students were 87% White, 11% African American, and 4% Asian American. The PE teacher was male, with 23 years of experience, including teaching and coaching at this particular school. The human subjects Institutional Review Board approved this study, and informed consent from teacher, parents or guardians and child assent were obtained prior to the study. The teacher and students' names used in this study are pseudonyms, and students quotes have been reported with grammar errors intact.

Professional Development

Prior to the study, the teacher received four two-hour sessions of professional development (PD) on SDG. These sessions were delivered via Skype from one of the researchers, who had previous experience in training PE teachers in SDG. Followed the beginning of the study, PD was limited to two-hour once a week sessions, in a period of four weeks. The other researcher was present during all training and teaching sessions, and provided onsite assistance throughout the study. The PD consisted of introducing the five-step SDG methodology (Hastie & André, 2012), discussions, reflections and suggestions for the lesson plans.

Student-Designed Games: Implementation Procedure

This study used Hastie and André (2012) Five-Step SDG implementation procedure:

Step 1 – SDG introduction. During Lessons 1 and 2, the teacher introduced four different games to four groups chosen by the teacher, composed by seven to eight students each.

The intent of introducing these games were to: (a) introduce games from different categories (i.e., net/wall, target, invasion, and striking & fielding), (b) explain what constitutes a game category, and (c) question students what other games fall under each category, and consequently evaluating their understanding about the games categorization. The lessons were organized in 4 stations: (a) Four Square as a net/wall game, (b) Corn Hole as a target game, (c) a modified Kickball with two bases as a striking & fielding game, and (c) Ultimate Ball (Ultimate Frisbee played with a ball) as an invasion game. During both lessons, each group played all four games, followed by a debriefing to discuss games/sports similarities within each category.

Step 2 – Learning about game design. The game design involved learning about one specific game category. In this study, the category was target games. Lessons 3 and 4 introduced students to four different target games. From this point forward in the unit, students participated in six assigned groups ranging from four to five members. Four groups were coeducational; one group consisted of only boys, and another only girls. The teacher selected the group members based on his observation of students' engagement during lessons 1 and 2.

Lesson 3 focused on introducing Frisbee Golf and Croquet. Lesson 4 focused on Football Bowling (i.e., players use an American football to strike bowling pins). Three stations were set up for Croquet and other three for Frisbee Golf in the school outdoor fields. In the beginning of the lesson, the teacher explained the common leading questions of the target games category. The leading questions are main topics that need to be covered in order to avoid pitfalls in the game design (Hastie, 2010). Each group received a two by two-foot laminated poster with the leading questions. At the end of the lesson, each group answered all the poster's leading questions while referring to the games that they learned. The questions were responded with dry

erase makers so the poster could be reutilized in other lessons. This procedure was developed in order to evaluate students understanding on the leading questions.

During Lesson 5, in the gymnasium, the teacher started the lesson with a familiar for the students called “Pins Down”. Students played Pins Down using its original/familiar rules. After the game, the teacher asked students to respond to the leading questions on the poster. The teacher then reviewed the questions and presented a different way to play Pins Down. He modified few rules and discussed them with students. Students played the modified version of Pins Down, and during debriefing the teacher responded to the leading questions on the poster. During Lesson 6, the teacher reviewed the leading questions of target games, and asked students to work together and create their own game. He explained the three rules in which they all had to follow while designing their games: (a) everybody needs to agree with the rules of the game, (b) everybody must take part of the game, and (c) each group must respect their own boundaries as play space. During monitoring and debriefing, the teacher could assess how well students were grasping the characteristics of target games and used this information to design the next lesson. Based on students’ difficulties in designing their own games, during Lesson 7, the teacher asked students to modify a familiar target game, instead of creating a new one. Therefore, three groups were assigned to modify Corn Hole, and the other groups were assigned to modify Football Bowling.

Step 3 – Playing each other’s games. During lesson 8 students gave a name and refined their games in the beginning of the lessons. Three teaching groups were assigned to show and tell their games to another group. Students had a chance to choose members to explain the game and members to demonstrate the game. Then everybody played the game. Following gameplay,

both groups sat together and the learning groups gave feedback on the game. Lesson 9 followed the same strategy, but with different teaching and learning groups.

Step 4 – Games refinement. Based on peers' feedback and their own experience in presenting the game to others, during Lesson 10 each group worked on the process of changing rules and reconfiguring games to enhance the final version of the game.

Step 5 – Establishing the final version of the game. During Lesson 11, the last session of the target games unit, the teacher told students a story about how the game of basketball was initially created, how it fit the needs of an indoor game and how the rules evolved throughout time. Followed the story, students were told that their games have been through modification and perhaps with time other changes will be made. As a culminating activity, each group completed the playbook; a booklet that had already been printed with the leading questions. The lesson ended with the teacher telling students that they playbook would be used to teach their game to other classes.

Fidelity of the Procedure. Data were collected throughout the 11-lesson unit to ensure that the Five-Step SDG procedure was implemented, ensuring the model's fidelity. The teacher was provided with a list of major topics and procedures as a reminder content to be covered in each lesson. It is important to acknowledge that this procedure was conducted as a supporting mechanism as requested by the teacher as the authors recognized his vast experience in teaching, but did not intend to overwhelm the teacher with a new methodology. Each lesson plan was designed based on the previous lesson and prior to the teaching day. The primary researcher had a copy of each lesson plan during lessons to ensure that the components of the procedure were presented during all sessions.

Data Collection

The study included two sources of data collection: (a) field note observations, and (b) post-intervention interviews.

Field note observations. The field note observations were collected during the eleven 50-minute lessons of the SDG unit. The first author assisted the teacher to monitor all lessons and reconstructed the behavior occurrences and students' conversations during and sometimes immediately after each lesson. The intent was to observe types of social interactions that occurred during game design with group members, and with other groups.

Post-intervention interviews. The post-intervention interviews were conducted with each of the six groups of game design. The first author followed the entire SDG teaching unit and therefore able to build a rapport with students. The interviews sought to engage in a conversation that would seek for further explanations of what was observed during their interactions during the game design. The interviews presented a semi-structure script with questions developed while considering the field note observations and related questions according to students' statements that could have been further explored.

Data Analysis and Trustworthiness

Both field note observations and the transcribed post-intervention interviews were analyzed through a systematic process of inductive analysis and constant comparison as per the protocols recommended by Denzin and Lincoln (1994) and Lincoln and Guba (1985). The initial coding procedure consisted of identifying observable behaviors from field notes that occurred frequent times, and also single events that were noticeable (e.g., a group member crying). The post-intervention interview transcripts reflected students' perceptions of their social interactions during the unit. They were coded in a similar way to field notes and used to compare, confirm or contradict interpretations made through field notes. When multiple occurrences of observable

behaviors or perceptions of behaviors proceeded, themes were generated. In order to guarantee the study's trustworthiness, two processes were conducted: triangulation (Stake, 2002) and peer debrief (Lincoln & Guba, 1985). As aforementioned, the themes were generated based on multiple sources of data ensuring that the same behavior could be identified while conducting different forms of data collection. Both researchers coded and analyzed field note observations and the transcribed post-intervention interviews separately. Hence, they were able to compare data and to ensure that there were enough agreements between their analyses in order to establish the themes. During this process, one researcher presented five themes, while the second presented six themes. After deliberation, the researchers were able to find enough similarities in four themes, eliminating three themes that did not have enough accordance between the two findings that were initially reported by each researcher separately.

Results

Two themes were generated based on field note observations and students' focus interviews. First theme described group members' perceptions of leadership; this theme was broken down to two sub-themes: (a) who is the leader? and (b) leadership dispute. The second theme described group engagement, identifying what made students engage or disengage from working together towards a final goal (game design), this theme was broken down to two sub-themes: (a) compromising, and (b) disengagement.

Perceptions of Leadership

The teacher provided freedom for students to organize their group tasks according to their preferences. All groups received a series of tasks to complete their game design, but there was no delimitation on how each student individually should take part in the collaboration of the game

design. During initial stages of game design, it was observed that students who held the marker and wrote/drew on the poster, were perceived as leaders by self and others. These occasions were observed during two major occurrences: while delineating the main idea of the game, and while writing down the rules and diagrams.

After noticing that the control of the marker was generating different types of interactions, the teacher prompted students:

Teacher: The person who is holding the marker is very important to the group, not because this person would only write down her/his own ideas, but because before writing, she or he would listen to all members and ask the group to make a decision. If there is a disagreement, group members will need to be flexible and compromise.

This prompt helped some groups to be more thoughtful of whose ideas were being considered during the game design, and how leaders came up with a consensus among group members.

Who is the leader? Although group leaders interacted with members in different ways, children perceived leaders as the group member that gave guidance on how to organize the tasks. While there were leaders that ensured that all opinions were taken into consideration, other leaders wanted to control the discussions to create the games according to their own ideas. Two forms of leadership were identified while considering all six groups: autocratic and democratic.

Autocratic leadership was observed when one or two members of the group held authority and responsibility for making all decisions with little or no input by other members. Groups 1 and 2 were identified in this form of leadership.

Group 1 consisted of three girls and two boys. Joanna was the leader. She consistently took the roles of writing rules, drawing diagrams, explaining her ideas, demonstrating the game and setting up the equipment. During lesson observations, there was no evidence that other group members' ideas were being considered. It seemed that group members, liking or not, complied with Joanna's ideas and leadership style:

Jerry: Joanne was the leader

Interviewer: Why do you think she was the leader?

Jerry: She was the smartest. She's the one that kind of made up [the game]. She basically told us about. She's the one that made decisions and if we didn't agree, she would come up with something else.

Group 2 consisted of three girls and two boys. Abby and Danna were the leaders. They alternated the writing on the poster, and led the talk within the group. During lesson observations, it was noticed that the other three members of the group were conformed to Abby and Danna's leadership roles. Ellen stayed on task and seemed to enjoy their ideas. Jack and Wallace did not demonstrate enjoyment, but did not argue with them. They frequently disengaged from group tasks, by playing alone with some object or just standing by. The teacher was never asked to intervene in this group. Abby reported that Danna's and her ideas prevailed over others:

Abby: We were writing and practicing how we would design it and stuff. And they were trying to change up the game. And then we were like: no, we're just going to keep it the way we had it.

The democratic leadership was observed when one or two members of the group would involve other members during decision-making processes. The leaders provided most of the ideas while creating the games, but frequently listened and considered other group member's ideas during game design process, and their participation during presentation of the game to other groups. Four groups (3, 4, 5 and 6) were identified in this form of leadership.

Group 3 consisted of two girls and two boys. Carol and Julia were the leaders. They seemed to be close friends, and were comfortable to take leading roles. Gary and Sean consistently agreed with their ideas, but also had opportunities to give input during game design:

Carol: Well, actually, we [two leaders were identified in this group] wanted everybody to have a chance [to give their input], so we were going in a circle for each number [voting the rules of the game]. But then we were also trying to make it where the other kids could read it, like the handwriting. Yeah, so somebody had to think about what's the best handwriting.

Interviewer: But Julia took the lead most of the time?

Carol: Yeah. Sort of, sometimes. I couldn't write cuz I can't write neat.

Interviewer: Did you talk about this game when you were designing it outside of the class?

Carol: Sometimes, like on the playground, me and Julia did [discussed the game outside of the class]. Like when we were on the playground, we would discuss it, so we have our ideas. It's like we were in PE, but we already had our ideas ready, so when came into PE, we would tell them [other group members] our view, and we would just start setting it up.

Group 4 consisted of two girls and two boys. Kelley and Terry were the leaders. Despite having most of the writing duties divided between the two leaders, it was observed in several occasions that Kelley made an effort to organize the group in a way that every member had a chance to express their own ideas. Kelley managed the voting system, and she was the one who requested help from the teacher when participants showed difficulties to solve problems or make decisions.

Kelley: Whenever I said something then somebody else had a different idea. I just learned more about that person and what they like more than usual. It's good because when we started writing it down, like what kind of game we should get and stuff, people started agreeing, saying "Hey, we should use a tennis ball or something or throw it or something, like underhand." And people were like, "maybe." And we ended up with the volleyball. Yeah, and then everybody liked it, so.

Group 5 consisted of five girls. This was the most complex group to define a leadership, at times it was observed features of a team leadership, but it was the only group that reported a leadership dispute. It was observed that Melody was the most prominent leader, but Mary, Mandy and Laura, also led several tasks and perceived themselves as collaborators in all roles

and decision-making process. Audrey, however, demonstrated the desire to be an autocratic leader, but the group did not accept her ideas or demeanor. In one instance, Audrey had a conflict with Melody, and left the group. She sat isolated away from group members, and started setting up her own game. The teacher noticed her isolation and approached her. Audrey explained that she wanted her idea to be followed by the group, because she didn't like others' ideas. The teacher told Audrey that she could not make all group decisions. She needed to listen, and accept others' opinions in the same way she wanted hers to be listened. The teacher approached Group 5 and suggested combining Audrey's ideas with others. On another occasion, Laura requested teacher's help because her ideas were not being listened. Laura expressed that she was trying to speak to the group about finding a way to combine all ideas. The teacher then talked to the group about combining ideas. By the end of this lesson, all girls' ideas, but Audrey's, were merged into a game.

Laura: We needed [teacher's] help a little, but we solved the problems mostly ourselves. We combined our games so that nobody would be mad.

Group 6 consisted of four boys. No conflict within the group was observed. The boys perceived themselves as friends since third grade. Aaron was the group leader. Even though he did not perceive himself as a leader, he was the group manager in terms of listening and elaborating a group decision. He also took the lead in writing on the poster and in presenting the game to another group. "I was just writing. If they had a good idea and all of us would probably agree or not, and then if we did, I'd just write it down." The teacher was never asked to intervene in this group.

Leadership Dispute. This theme was a particularly found in one group alone, however, it was considered important and reported as a theme due to its relevance to reflect upon students' relationships. It was consistently observed that Group 5 (all-girls group) had leadership conflicts as one of the group members (Audrey) wanted to be the leader, but she was not perceived as such by the rest of the group members. The dispute for leadership led to a number of discussions, as members were dissatisfied for being ignored by Audrey. The teacher felt the need to intervene several times to ensure that students would find a common ground. Teacher interventions had successful and unsuccessful days. Despite the teacher's efforts to solve intra-group conflicts, Audrey was seen as an outcast throughout the game design process. During several occasions, she isolated herself from the game design discussions and even tried to create a game just for herself. Melody (Group 5) communicated her frustration with Audrey during the presentation of their game to another group,

Melody: Some kinds of people don't want to hear other people's ideas and experience, cuz they only want theirs, and Audrey was like that. I was like 'Why don't you let us talk too?' And she [Audrey] was like, 'Because everybody agreed that I was the talker.' And I was like, 'There's supposed to be two talkers [during the teaching the game to other groups]. And she [Audrey] was like, 'Well, I don't care,' and I don't think she gets along with other people. And she's just her own self. And she doesn't really want hear what other people want.

Conflict, dispute, disagreement, anger, and dissatisfaction were regular emotions throughout the designed game period. Audrey did not feel included in the group from its very beginning. These interview quotes demonstrate Audrey's frustrations,

Interviewer: I noticed that you cried a lot. Why did you cry?

Audrey: They didn't listen to me and my ideas. I had an idea and they just rejected it as soon as I said it.

Interviewer: They rejected it. Did you accept any of their ideas?

Audrey: Only a little bit. And I say an idea, and they're like, "No, let's not do that." And then a couple minutes later, they say the same thing and claim it as their own work.

During the interview, Melody expressed her thoughts about Audrey's group participation,

Interviewer: Mr. Edwards established two rules for the groups. First rule, everybody had to agree with all the rules of the game. Do you think everybody in your group was able to follow that?

Melody: Not everybody. Audrey was like a mess around. She tried to change the game on us.

Interviewer: And how did you feel when you had that problem?

Melody: We didn't feel like we were in the group no more. Audrey was like trying to take over, be our boss and everything. I felt very upset. Very upset. She got mad and started to cry because we wouldn't do her game.

Leadership disputes appeared to be frequently observed in the all-girls group, and non-existent in other groups.

Group Engagement

During lesson observations, positive social interactions such as listening to other's ideas, sharing turns to write on the poster and to speak to the group, and acceptance of others' ideas occurred most of the time. It was our understanding that the working environment created by each group had a big impact on the level of engagement. Group 1, had an autocratic and dynamic leader (Joanna) that few times allowed other group members to give input. It seemed that although her style may have oppressed some group members, her dynamism allowed the group design and play the games with interest. Karen and Jerry, members of Group 1, expressed their enthusiasm when group members had active roles:

Jerry: It was fun when we were actually playing the game. It was funner when we were playing the game than we were planning it.

Karin: My favorite part was to play the game and work together.

Similar enthusiasm was observed in Group 4, which had a democratic and caring leadership carried mostly by Kelley. She asked for teacher's assistance to reassure group members that one person's ideas would not prevail without group agreement. Teresa, a Group 4 member reported:

Teresa: I liked the part where we got along and where we actually got to try out the game, and tell other people the game. Most of their ideas were good too, but then we just put all the ideas together and made a good game.

Compromising. Compromising was a concept explained and reinforced by Mr. Edwards from Lesson 7 forward. The teacher and researchers did not anticipate the introduction of this concept, but the disagreement situations in some groups triggered it to emerge and be reinforced. It was observed that the group positive engagement increased when different groups recognized the importance of compromising. These groups started explicitly listening to members' ideas, voting on their opinion, and explaining to each other that the majority of the votes would count on the decision-making process. These episodes occurred specifically in Groups 3, 4, 5, and 6, in which leaders had a democratic approach. Autocratic leaders did not demonstrate empathy for compromising, because they made most of the group decisions, and participants did not argue with them.

During the interview, Melody, main leader of Group 5, brought up the concept of compromising in the following way:

Interviewer: The second rule established by Mr. Edwards was that everybody had to play the game. So do you think everybody was able to play the game even with all these disagreements or not?

Mandy: We had some disagreements, but not much. We had the idea to combine both of the games so that nobody would be mad. I said, "How about we compromise?" because we were learning it in social studies, compromising.

During teaching the game to another group, Carol (Group 3) and Kelley (Group 4) asked the teacher if they could combine both group-designed games and come up with one. After few minutes Josh (Group 4) reported to the teacher that he was not agreeing with everything they were doing. The teacher asked the group to work together to solve this problem. Kelley responded to the teacher that both groups voted on the decisions, and seven members agreed with the game and Josh didn't. The teacher said that the majority of votes would prevail, and asked Josh if he could compromise this time. They would have a chance to vote another time. Josh accepted the idea, and kept playing with both group. Julia (Group 3) explained how she liked to compromise,

Julia: I liked how we could compromise our game.

Interviewer: Can you explain what "compromise the game" is?

Julia: It's like someone. We would do a vote of who liked it and who didn't. And then if they didn't like it, we would see their ideas, and then we would put it in with our ideas and then we compromised, and they started to like it. Like we would try it out and if it was better or worse, we would take it out or we would leave it in. Sometimes you can put your ideas in there. Sometimes you can't because it's what everybody wants; it's not what you want. So we had to compromise that.

During focus interviews it was noticed that compromising became the motto of all groups. It seemed that most members from each group understood it's meaning, and many demonstrated that they could apply it during the game design period.

Disengagement. Throughout the SDG unit, it was observed several occasions of students' disengagement in the lessons. During the introduction of SDG (Step 1 - Lessons 1 and 2), students were placed in random groups and played four different games. Occurrences of disengagement were noticed when students: (a) did not pay attention to teacher's directions, (b) did not follow rules of the game resulting in playing alone by his/her own rules, and (c) loss of motivation in participating by not being able to keep up with physical or motor skills required in the game.

During the game design (Step 2 - Lessons 3-5), students participated in persisting assigned groups and played different target games. No incidences of disengagement were observed in Lessons 3. During Lesson 4 and 5, few incidences of disengagement occurred when groups were responding to the leading questions on the poster. More incidences of disengagement and conflicts arose from Lesson 6 forward, when students had to design, refine, and play the game.

Joanna and Karin (Group 1) reported their frustration regarding Jerry and Jared's disengagement:

Joanna: They were running around and stuff. Especially Wallace [from Group 2] and the two boys [Jerry and Jared].

Karen: I didn't like when Jared wasn't listening to what we had to say and he was just off playing. Yeah, and he was just like out, like not with our group. He was doing pull-ups. And they're like, yeah, and they were playing and stuff together and they were laughing and stuff.

Audrey (Group 5) demonstrated several incidences of disengagement during game design period. It seemed that she wanted to be heard and followed.

Interviewer: I noticed that you didn't want to be with your group. There was one day that you asked me, "Can I have my own group? Just me?" Is that because you don't like to play with the other girls, with the other people in your team?

Audrey: Some people on the team I don't like, and they're mean. Some of the people in there I don't like cuz they're not my friends. I wanted to be with some of my friends.

Based on lessons observations and focus interviews, it was noticed that across all groups, except for single-gendered groups, girls tended to be leaders, and boys had higher rates of disengagement than girls. In addition, it was observed that in autocratic groups (1 and 2), boys tended to disengage from tasks more often than in democratic groups.

Discussion

This study was designed to answer two research questions: (a) what types of social interactions were observed during a SDG unit, and (b) how students perceived their interactions with peers during the unit. Students' social competences are typically theorized as desirable set of context specific social skills (Rose-Krasnor, 1997). Given the need to work collaboratively in order to design games (goal set for each group), students intra-group social interactions showed to be more complex and became the center of the study's focus. The leadership seemed to be a

key element that determined each group's process to accomplish the goal, as well as group members' engagement during the game design process.

Leadership

Having the same concept of promoting the creation of games, but with a different teaching methodology, Butler (2013) proposed that in order to create a democracy within groups, a structure for each group needs to be established. According to Butler (2013) procedures for making decisions need to be in place while following five principles (a) not all decisions will be unanimous, (b) rules need to be implemented to allow and respect members to speak, (c) how voting system operates, (d) how to handle conflict within the group, and (e) how can all members of the group be included. This study, however, did not establish any structured system, other than the three rules stated and reinforced by the teacher: (a) everybody needs to agree with the rules of the game, (b) everybody must take part of the game, and (c) each group must respect their own boundaries as play space. The intent of the study was to observe how students interacted to create their own structures in order to complete the task of designing their own game.

Even though this SDG unit provided equal opportunities for girls and boys to take leadership roles, the results of this study showed that girls from all coeducational groups (Groups 1-4) were perceived as leaders. This finding is significant because previous studies have shown that power positions are stereotypically attributed to boys (Constantinou, Manson, & Silverman, 2009; Voelker, 2016), while girls are stereotypically marginalized, isolated, and consequently alienated in PE classes (Carlson, 1995; Constantinou et al., 2009; Hastie, 1998). Hastie (1998) pointed out that sixth-grade girls improved their active participation and increased correct trials

during a sport education coeducational unit of floor hockey. However, they were not given opportunities to take leadership roles within their teams.

Several aspects could have influenced these fifth-grade girls to take leadership roles: (a) there were more girls than boys, (b) student-centered approach was a novel pedagogy, (c) all students had prerequisite skills to play the target games, and (d) persisting teams motivated their participation.

It is important to call attention that providing equal opportunities may not be enough for engaging all students in a physical education class (Ennis, 1999). Enright and O'Sullivan (2016) showed the importance of negotiating a curriculum in order to enhance girls interest and engagement in physical education. Although SDG is a different process than negotiating a curriculum, it empowers students as they have the liberty to create a game in which they want to be engaged. As a result, it is possible that groups that may be overlooked in regular PE classes (e.g. girls and lower skill students) are likely to be excited with this new environment as it has been reported in previous research. Similar to other student-centered approaches, SDG allowed group collaboration in the decision-making process, instead of just completing a task stated by the teacher during direct instruction approach (Hastie, 1998; Koekoek & Knoppers, 2015). In addition, working on a novel activity offered possibilities to all students to be involved in the creative process. Previous studies (Casey & Hastie, 2011; Casey et al., 2011; Hastie & André, 2012) indicated that while students with higher motor skills levels demonstrated a better understanding of rules and tactics of games, creativity and engagement in designing a new game was not impacted by skills level. However, this study does support a new evidence as girls took the leading roles whenever placed in a co-educational group. This is a new scenario that it is not

completely understood at this time, and that would need deeper investigation within each group to confirm why it occurred in a consistent manner.

Persisting groups are a common feature in student-centered approaches. Similar to SE, CL, and TG approaches, SDG includes the concept of persisting groups as way to develop social interactions (Dyson et al., 2004). In addition, group affiliation has the potential to provide students who have previously been isolated or marginalized with a chance to be part of group (Wallhead, Garn, & Vidoni, 2013). Hastie (1998) reported that girls felt included, important, and enthusiastic during persisting mixed groups. In this study, we can suggest that the female and democratic leaders from Groups 3, 4 and 5 motivated peers to take ownership in the designed games. Whereas the female and autocratic leaders from Groups 1 and 2 lacked the ability to keep male members consistently engaged in the game design process.

Engagement

Engagement in this study was demonstrated through students' interests and enjoyment in participating in the lessons, and focused attention to complete the group tasks. Fun in working together was a common statement among participants across groups during focus interviews. Positive engagement was observed and perceived by students during intra- and inter-group activities. Observed interactions were positive, resulting in several groups combining their games. Recently, in a SDG study, André and Hastie (2016) reported that students demonstrated positive engagement during intra-group interactions, but challenges arose during interactions with other classmates (inter-groups) during game refinement. In this study, for the most part, students seemed to enjoy playing their game and each other's game. Groups 3, 4, 5 and 6 reported they had fun in combining their games with the other group.

Compromising seemed to be a concept introduced by the teacher and explicitly adopted by Groups 3, 4, 5, and 6. It was observed and perceived by students that discussing and compromising during decision-making process resulted in more consistent incidences of positive social interactions, such as listening to others, accepting others' opinions, voting on group decisions, and patiently justifying to all members why final decisions were made. It can be suggested that compromising helped strengthen most groups' affiliation, resulting in absence of disengagement. These findings are consistent with previous SDG studies (André & Hastie, 2016; Casey & Hastie, 2011), where students' commitment to work together as a group helped to enhance their engagement.

Occurrences of positive engagement were also observed and perceived by many students in Groups 1 and 2, in which leaders adopted a more autocratic style. However, these two groups presented more incidences of disengagement. Constant observations and deeper level of focus

interviews would be necessary to capture how these groups interacted reacted in each step of the unit. These findings align with Johnson and Johnson's (1999) conclusion that placing children in groups does not necessarily result in cooperation. We can speculate that, if Butler's (2013) strategies of group decision-making process were implemented, these types of interactions would result in better conflict resolution and greater social and emotional learning experience.

Conclusion

The results of this study presented findings on how different groups interacted and created their own structure to design their own games. Two types of leadership styles were broadly categorized as democratic and autocratic. However, the authors believe that within each group, different spectrum of leadership categories could be explored. Future studies, could consider utilizing more extensive methods of data collection such as periodic group and individual interviews, and video and audio-recording of group interactions. Girls taking leadership roles is a new finding, as it contradicts previous research in PE. Future studies are needed to confirm if SDG can stimulate girls to lead the groups. In addition, future research may consider to investigate whether different team organizations have an impact on students' social interactions and leadership roles. PE pedagogical models have been researched and advocated as teaching practices that may empower students with a student-centered pedagogy that promotes cooperation and positive interactions among students. This study has contributed to the literature to bring light to the need of organizing the learning environment and establishing group dynamics in order to avoid undesirable and harmful relationships.

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