

PEDAGOGY

Gender Differences in Student-Designed Games

Mauro André and Peter Hastie

Abstract

Given the concern of presenting physical education environments that promote equity, it is appropriate to study innovations that can achieve that goal. In this study, that innovation took the form of student-designed games (SDG). SDG is the process in which students create, practice, and refine their own games and in which the teacher acts more as a facilitator. In this project, we focused the influence of gender on two main topics with a cohort of 82 junior high school students in ten 75-min lessons over 5 weeks. These topics were (a) enjoyment and engagement and (b) game design outcomes. The research was conducted under case study design and involved three sources of data (field notes observations, focus group interviews, and survey). The quantitative data indicated that although all students appreciated the opportunity to design their own games, girls enjoyed the SDG process more than boys did. Further, from the interviews and observations, three themes related to students' enjoyment/engagement were generated and a notable difference was observed in terms of game design outcomes. The students said that they "enjoyed being able to work with groups chosen by themselves," that they did not believe that "boys and girls work well with the opposite sex," and that "playing games with your own group members is preferable." In terms of game design outcomes, girls created more ludic games, whereas boys created more strategic games. These findings show that SDG may be a powerful mechanism for empowering girls within physical education.

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Society has promoted many forms of hierarchy based on ethnicity, religion, origin, culture, sexual orientation, and gender. Although physical education should be a site that minimizes prejudices, ample evidence suggests that it has served to reinforce segregation, emphasizing differences rather than promoting a reflexive play that would promote an understanding about diverse values (Flintoff & Scraton, 2001; Penney, 2002; Valley & Graber, 2017).

As an example, many sport-based physical education programs have led to competitive environments that extend beyond the teacher's control. Stimulating the promotion of a few high skill students and excluding many low skill students, these environments have a particularly negative effect on girls (Hills, 2007; Hickey, 2008; Constantinou et al., 2009). Ennis (1996) has presented these examples of sport dominance and student exclusion as some of the reasons why "more than apologies are necessary" (p. 453) to many students within physical education lessons.

Although many feminist scholars have noted that a shift in physical education approach may produce significant changes in girls' participation (Ennis, 1999; Enright & O'Sullivan, 2010; Scraton, 2018), most physical education curricula still present sport-based activities as the predominant content, highlighting gender differences and promoting disagreements (Azzarito & Solomon, 2005).

Dealing with undesired curriculum options; facing social challenges by teachers, peers, and even parents; having a poor image about their own abilities; and suffering sexuality prejudice harassments are all scenarios that constitute the physical education environment in the eyes of many girls. In seeking active alternatives, Azzarito et al. (2006) reported that girls were more willing to avoid issues that promote exclusion than to seek solutions to overcome them. For example, these authors reported that if female students had a choice, they would rather focus on activities such as tennis and badminton because they considered these more enjoyable because they were easier to play (i.e., having a better self-perception about their ability) and because they were able to play for fun (i.e., without overstressed competition). The same study also reported that girls would avoid activities that were predominantly played by boys (e.g., basketball), as well as other activities they considered to be too competitive and aggressive, because boys would criticize their performance.

In the aforementioned study, girls only oriented their choices based on what they had learned in physical education classes, with those choices often being limited to the lesser of many evils. The first study to address content itself was Oliver et al. (2009), who allowed and encouraged disengaged girls to modify games and activities that they knew, to promote higher levels of engagement. The outcome of that study was the presentation a book of activities that the girls were able to play and enjoy.

The idea of empowering students with the opportunity to design their own activities inverts the paradigm in which they must learn several new skills and adapt themselves to predefined rules. Hence, students are given an opportunity to create activities that intimately relate to their interests and skills and in which they are more likely to be successful.

Student-designed games (SDG) is the process in which students create, practice, and refine their own games and in which the teacher acts as a facilitator while providing guidelines and establishing limits to ensure students' safety and positive learning experience (Hastie, 2010). SDG have been identified as a physical education content that has the potential to enhance students' understanding of and respect for individual differences, given that "students will interact positively with others in their class regardless of personal differences (e.g. race, gender, ability, disability, culture, ethnicity, religion) and can recognize similarities and differences between and among people that contribute to cooperative and competitive activities" (Hastie, 2010, p. 13). More recently, Vidoni and André (2017) reported that SDG promote many leadership roles for girls who were more supportive in encouraging a more democratic and motivating environment to all students.

Given the concern for providing an environment with more equity in which students are given the opportunity to relate to their own interests, it is important to gain a better understanding of what gender differences might arise during such a creative process in a physical education class. That is, although SDG seek to empower students' opinions and encourage students to relate to their interests, it would be valuable to learn how gender might affect the creation of games. Hence, this study analyzed gender differences during two SDG interventions. More specifically, the research addressed the

following research objectives: (a) how gender differences may affect students' enjoyment/engagement in SDG units and (b) how gender differences may affect game characteristics in SDG units.

Method

This research was part of a larger study that analyzed different aspects of SDG including teaching methodologies and students' learning and experiences. As the study developed, the gender differences that had arisen in this intervention became overwhelming; hence, further exploration to understand the different interpretations of SDG turned this study toward a case study design. According to Schwandt and Gates (2018), "a case can be designated as specific and developed during the course of the research" (p. 342). Hence, this study followed a descriptive case study design, seeking to portray the different appreciations (engagement and enjoyment) and game designs that each gender experienced while engaging with the same SDG teaching unit.

Procedures: Implementing the Intervention

The SDG unit followed André and Hastie's (2018) five-stage methodology. These were (1) SDG introduction, (2) learning about game design, (3) playing each other's games, (4) games' refinement, and (5) establishing the final game.

The focus of the SDG introduction (Stage 1) was on checking students' previous knowledge and introducing a number of game forms that highlight differences in rules concerning manipulating implements, moving with and without possession, and scoring. In addition, a number of tag games were also introduced. These were mainly focused on locomotor skills and moving into open spaces and hence were less skill demanding by design. Therefore, Stage 1 presented all five games categories (tag, target, net/wall, striking and fielding, and invasion) identified by Hastie (2010), providing the full range of all social games (also known as games with rules) that could be designed. The game design (Stage 2) process involves students learning about the leading questions of invasion games (the chosen category for this project) to design their games. This category was chosen because it provides the most scope for innovation in design

and for the development of games that suit the agendas of the different teams of players. Moreover, although students were first introduced to the leading questions of one category, some groups still chose to create games from other categories (see Tables 3 and 4) and they were still allowed, encouraged, and supported to design their games according to their interests. This stage gave students the guidelines to design their game. For instance, Hastie's (2010) game design leading questions call attention to what needs to be answered for students to avoid pitfalls in game design. Playing each other's games (Stage 3) involved students playing other groups' games and providing feedback to improve that game. Games' refinement (Stage 4) was the process in which the design teams had the option of altering rules and modifying their games to enhance the final version. Establishing the final game (Stage 5) was the process of recording all game details (rules, equipment, boundaries, etc.) in a game playbook.

Participants and Setting

The participants in this study were 82 eighth- and ninth-grade students (34 male, 48 female) from a junior high school in the Southern United States. All participants provided assent to participate and their legal guardians gave informed consent. The study protocol was approved by the university institutional review board for human subjects research.

The SDG intervention consisted of ten 75-min lessons over 5 weeks. Although all lessons were planned and taught by Mauro André, the students' two regular physical education teachers were present during all lessons. These teachers supported André with equipment and class management, supervising students' activities, and providing game instructions in the early lessons when students were participating in teacher-designed games. Both teachers were highly interested from the commencement of the project, constantly asking questions about upcoming activities or about the findings discovered up to that point.

The study was introduced to two groups of students (from the same school) that were taught on different days of the week. In total, the students became members of 17 construction teams that remained together throughout the project. Each of the two groups

could select its own members, provided one rule was followed. That is, each group must consist of between three and five members. Group 1 was formed by 31 students (12 male, 19 female) and had 7 groups (all single-sex). Group 2 was formed by 51 students (22 male, 29 female) and had 10 groups (2 coeducational, 8 single-sex). For the most part, students chose to remain in single-sex groups.

Data Collection and Analysis

The research utilized three methods of data collection. These were field note observations, focus group interviews, and surveys.

During all lessons, André used a portable voice recorder to make field note observations, describing, analyzing, and including students' quotes while observing students' actions. Regarding the first research objective (students' engagement and enjoyment), reporting students' reactions during each activity made it possible to better understand which activities students liked or disliked and to judge their commitment in the process of designing their games. Regarding the second research objective (designed-games characteristics), reporting students' discussions during each lesson and during their game design in particular made it possible to better understand what kind of characteristics students were seeking when designing their games.

At the completion of the intervention, focus group interviews were conducted with each of the 17 construction teams. The questions were developed according to key issues developed within the field note observations. Therefore, the interviews were used for two purposes: (1) to double-check what was reported in previous data collection and (2) to seek for further explanations on why and how students experienced their intervention. Regarding the first research objective (students' engagement and enjoyment), the purpose of the interviews was to find which factors enhanced or inhibited the students' experiences of the SDG teaching unit. Regarding the second research objective (designed games characteristics), students were encouraged to explain the reasons behind their game design. That is, the key task was to determine what features the students were trying to promote for those who would play their games (e.g., participation, challenge). Table 1 presents the full interview script.

Table 1*Interview Script*

Section	Questions
Introduction	<p>1 Did you like the SDG unit? What did you like or dislike in particular?</p> <p>2 Was this the first time that you had SDG in PE?</p> <p>3 What made you choose this group? Do you think you would enjoy as much with a group delegated by the teacher? Would you like to work with boys/girls [different gender]? Why?</p>
Students enjoyment & engagement	<p>In our class, we had 5 stages: SDG introduction Learning about game design Playing each other's games Games' refinement Establishing the final game</p> <p>4 Did you have a favorite moment and something that you did not like about it?</p> <p>5 Is there something in this class that you wish we would not do? (considering SDG unit)</p> <p>6 Is there something in this class that we did not do, but you wish that we did? (considering SDG unit)</p> <p>7 Do you consider your engagement in this class the same as in other PE classes, higher or lower? (If any changes) what made it different?</p> <p>8 Did you mind to stop playing to focus on the game design?</p> <p>9 Did you work outside of PE for this class? If so, how much?</p> <p>10 Did you see a purpose of this class?</p> <p>11 What did you learn with it?</p>

Table 1 (cont.)

Section	Questions
Game design characteristics	12 We have a list of the SDG that you played. Which one was your favorite and why?
	13 What did you learn while designing your game? How many times did you change? Did you come up with more than one game? What did you learn about the rules you introduced—how they fit your game/idea?
	14 What was your goal when designing your game? Novelty (new) Challenge Exploration/intention Instant enjoyment
	16 Did you notice anything different in games designed by boys/girls?
	17 Did you find the games that the boys/girls designed more/less fun or the same? Why?
	18 When proposing new rules on your own game or others, what were you trying to do? Turn the game more strategic Make the game easier for me to play/win Include everyone in the game
	19 If someone could not play my game, it was: My fault... Their fault...

Note. SDG = student-designed games.

The data analysis used protocols proposed by Lincoln and Guba (1985) and Denzin and Lincoln (1994) in which a systematic process of inductive analysis and comparison of methods is performed with both sources of data. First, the field notes observations were analyzed and the first interpretations delineated. Second, these analyses

were compared with all interview transcripts. When accumulative data confirmed the same concept, themes were generated.

On the last day of the intervention, each group took a five-question survey about the SDG unit. The survey was anonymous, ensuring that students felt comfortable reporting any dissatisfaction with the SDG unit. As such, the questions related only to the first research objective (students' engagement and enjoyment). Table 2 shows the survey. The analysis of the survey followed a one-way analysis of variance (ANOVA) to evaluate for statistical differences between male students and female students.

Triangulation and use of an ethnographer observer ensured trustworthiness of the data. Triangulation is the process in which a researcher uses multiple methods to analyze the same research question, which provides a more holistic perspective and reduces the likelihood of misinterpretation (Stake, 2002). Overall, this study used three methods, although the survey method was only used to address the first research objective. Therefore, the data collected with one method was either reevaluated with another method (to guarantee research rigor) or further explanation was drawn because each method provided complementary information regarding the subject matter being analyzed. The ethnographic observer is the process in which another researcher who is to be considered an expert on the studied subject matter takes a supporting role to ensure the proper delivery of the proposed theoretical framework (Hastie & Buchanan, 2000). Peter Hastie (second author) undertook the ethnographic observer role while attending many lessons and having several meetings to discuss the intervention pedagogy, which ensured consistency and model fidelity. Hastie also undertook fieldnote observations, as a member check when Mauro André (first author) was drawing analysis of students' actions.

Results

The results reported the gender differences during the SDG unit while considering their (a) enjoyment and engagement and their (b) games characteristics.

Three themes were reported while considering the disparities of boys' and girls' enjoyment and engagement in the SDG unit. These include Theme 1: girls reported higher levels of appreciation for the SDG unit; Theme 2: both genders appreciated their choice of group

members; and Theme 3: girls found it particularly important to play with other girls.

Although both boys and girls showed positive responses to SDG in all five questions, the mean scores for girls were higher for all five items, with two questions (Q2 and Q3) showing significant differences. In essence, girls more than boys suggested they would like to have more SDG experience and considered their enjoyment in SDG units higher than their enjoyment in other PE classes (Theme 1). Table 2 shows the scores for girls and boys by question.

Analysis of the field notes and focus group interviews showed that students of both genders enjoyed being able to work within self-selected teams. The girls, however, seemed to value this more than boys did.

In other PE classes, besides having control of the activity that was being developed, the teacher would also designate which group of students would work together. In the SDG units, students had the liberty to choose their group members, with whom they would not only work together to design their game but also play together. The great majority of students believed that they would not enjoy designing their own games if they could not choose their group members. The majority of students also expressed a concern at not being able to show their own personality or share their opinion while working with peers who were not their friends. One eighth-grade girl illustrated this point of view, stating, “I know I can be bossy, so if I am bossy, [my group members] will tell me to stop being bossy and other people may be shy to tell me to stop being bossy” (interview).

When discussing group membership, many students mentioned gender differences. Most boys and girls expressed that they did not consider themselves as being able to work well with the opposite sex (Theme 2). All students worked with both types of groups (single sex and co-ed) while participating in Stage 3 (playing each other's games and giving feedback). Boys expressed concern about working with girls, saying they believed that girls' ideas about games were different from their own. One eighth-grade boy illustrated this point and said, “Well, boys are more dominant [higher skill level] and girls' games taught little to no skill . . . and girls have very different opinions on things . . . and if you need to cooperate, it would be hard to do with different opinions” (interview).

Table 2

Comparison of Students' Overall Experience by Question and Gender

Question	Girls <i>M (SD)</i>	Boys <i>M (SD)</i>	<i>F</i>
Q1: How would you rate your overall enjoyment in the SDG teaching unit? (Rating 1–10)	7.11 (2.40)	6.5 (2.21)	0.88
Q2: Would you like to have more creating games experiences in PE classes? (Rating 1–4: <i>no way; probably not; most likely; and yes, definitely</i>)	3.15 (0.76)	2.59 (0.89)	7.09*
Q3: Comparing to other PE lessons in general, do you consider creating games in PE (enjoyment) (Rating 1–5: <i>Much worse, Worse, The same, Better, Much Better</i>)	3.91 (0.94)	3.21 (1.12)	9.42*
Q4: Looking at your overall experience in creating games, do you think that your participation was (Rating 1–5: <i>very low, low, ok, high, very high</i>)	3.82 (0.85)	3.76 (0.85)	0.06
Q5: Comparing to other PE lessons in general, do you consider your participation in creating games (Rating 1–5: <i>much worse, worse, the same, better, much better</i>)	3.91 (0.96)	3.74 (1.05)	0.11

Note. SDG = student-designed games.

* $p < .01$.

Girls also echoed the inability to work cooperatively sentiment when they stated they believed that boys would not work cooperatively with them. In this case, an eighth-grade girl noted, “Boys just say random things and we would have to write everything” (interview). Two groups of girls said that they would like to work with boys, but once again, they showed the same concern. An eighth-grade girl illustrated this scenario: “I think it would be fun to work

with boys because they have different perspectives . . . but it would be fun if they would actually put in the work, because some of the guys are just like ‘I don’t care’” (interview).

The appreciation of playing the games with your own group members was also noted, especially by girls (Theme 3). One ninth-grade girl pointed out the importance of playing with girls on your team: “[The boys] are all mean; they ‘hog’ the ball and don’t let you contribute” (interview). Girls often complained that boys would mistreat them for missing a play and/ or losing possession of the ball, whereas girls would not mind if they were not good and would even ensure that everyone got to participate in the game (field notes).

Boys, on the other hand, were more concerned with having a balanced game when playing and were less concerned about whether they were playing with their group members or with those from other groups. In fact, one boys group stated that they changed players a few times with other groups to ensure that the game was “even” (at a similar skill level; field notes).

For the gender impact of students’ game characteristics, it is important to remember that both SDG units were formed by 17 design groups altogether, 15 of those groups were single sex (9 female, 6 male) and 2 were coed. The comparison of game characteristics focuses exclusively on single-sex groups. It can be claimed that the girls created more ludic games, whereas boys created more strategic and challenging games.

Table 3 provides a summary of the games created by each female group and Table 4 provides a summary of the games created by each male group. These tables provide a reference point for the discussion of the comparison of elements of game design between genders.

The most declarative statement about boys’ and girls’ games is the significantly different purposes. According to one ninth-grade boy, “Girls have a different opinion about games . . . it is like that bouncing ball game [balloon ball], it is a very simple game, it is like a game of keep up [keeping a balloon without touching the ground]” (interview). Another eighth-grade boy expressed a similar perception: “All girls’ games were kind of capture the flag, it was less skill and more luck” (interview). Boys from both groups identified that girls’ games were more playful and less strategic. One boy mentioned, 3 out of the 9 games designed by girls had components related to capture

the flag, a game played by younger children. In addition, the games designed by girls were seen to present “less challenging skills.” As Table 3 shows, most of the girls’ games focused on locomotor skills (e.g., running and dodging) or manipulative skills that were less demanding (e.g., catching a beanbag and volleying a kin-ball).

Table 3
Game Summaries From Female Groups

Name of the game	Games details
Wall Ball Mix	<p>Concept: Variation of wall ball (net/wall game)</p> <p>Setting: Half indoor court with a wall. Designate 1 goal area for each team (each goal area is next to each other on the same wall). Play with 2 teams of 5 players. Use a tennis ball.</p> <p>Scoring: 1 point for catching the ball after throwing at the wall</p> <p>Progression: Every player must receive the ball before throwing to score.</p>
Balloon Ball	<p>Concept: Create an invasion game using a kin-ball (invasion game)</p> <p>Setting: Regular basketball court, using the basketball keys as end zones. Play with 2 teams of 4–5 players. Use a kin-ball (35’ radius).</p> <p>Scoring: 1 point for catching the ball inside either of the end zones</p> <p>Progression: Volleying and passing</p>
Bags to Mats	<p>Concept: Game uses beanbags for easy throwing and catching (invasion game)</p> <p>Setting: Indoor court with walls and no boundaries. 1 designated area (mat on the wall) at each end of the court. Play with 2 teams of 5–10 players. Use a beanbag.</p> <p>Scoring: 1 point for throwing the beanbag at the mat and 2 points for touching the beanbag to the mat while holding it</p> <p>Progression: Running and passing</p>

Table 3 (cont.)

Name of the game	Games details
Hogball	<p>Concept: Soccer played with a “horizontal” net (wide baseline, ball must cross all of it; invasion game)</p> <p>Setting: Indoor court with walls and no boundaries. Play with 2 teams of 5 players. Use volleyball.</p> <p>Scoring: 1 point for scoring in the soccer net</p> <p>Progression: Dribbling and passing</p>
2-Person Kickball	<p>Concept: Variation of kickball (striking & fielding game)</p> <p>Setting: 7 bases spread in a rectangle format inside an indoor court. Play with 2 teams of 8–10 players. Use dodgeball.</p> <p>Scoring: Run seven bases to score a point</p> <p>Progression: All kickers must have a partner. When kickers run, they must be holding hands with their partner.</p>
Catch the Frozen Kin	<p>Concept: Tag game with a prison. Use a kin-ball to tag players (tag game).</p> <p>Setting: Use an indoor court. Set a jail that takes one third of the court space. Play with 3 teams of 3–7 players.</p> <p>Scoring: 2 teams are runners and 1 team is a tagger. The tagging team must put an entire team in jail in less than 5 minutes to score 1 point.</p> <p>Progression: Tagging team must use the kin-ball to tag runners. One of the taggers may tag without the kin-ball to be able to protect the jail (runners may save their teammates by tagging them back).</p>
Flag War	<p>Concept: Mixture of capture the flag and dodgeball (hybrid tag-invasion game)</p> <p>Setting: Use an indoor court. Place a flag on both ends of the court and place 5–10 balls at the center of the court. Play with two teams of 10–20 players. Use soft dodgeballs.</p> <p>Scoring: Recuperating the flag from opponent team’s court wins the game.</p> <p>Progression: Running—when on the opponent’s court capture the flag (may be tagged and must go to jail). Throwing—players from your team may throw grenades (balls) to eliminate opponents on their court.</p>

Table 3 (cont.)

Name of the game	Games details
Noodle	<p>Concept: Capture the flag with multiple flags (hybrid tag-invasion game)</p> <p>Setting: Use an indoor court. Divide the court in half and place 8 Hula-Hoops with 8 different objects inside (cones and different balls). Play with 2 teams of 5–6 players.</p> <p>Scoring: Recuperate the most number of objects in 5 minutes (or recuperate before 5 minutes)</p> <p>Progression: Running and tagging</p>
Dodge, Shoot, and Capture	<p>Concept: Capture the flag variation (hybrid tag-invasion game)</p> <p>Setting: Divide the basketball court in two. Each end of the court should have a flag on one side and a Hula-Hoop with a basketball on the other side. Play with 2 teams of 5–7 players.</p> <p>Scoring: Recuperating the flag from opponent team's court wins the game. When tagged, player must go to jail (Hula-Hoop with basketball—may have a “jail break” when player makes a basket).</p> <p>Progression: Running and tagging</p>

Table 4*Game Summaries From Male Groups*

Name of the game	Games details
Ultimate Basketball	<p>Concept: Mix of basketball and football. Played with a basketball, but player had to get to an end zone to shoot the basket (invasion game).</p> <p>Setting: Regular basketball court with end zones starting at the free throw line. Play with 2 teams of 4 players. Use a basketball.</p> <p>Scoring: Put basketball in regular basketball hoop</p> <p>Progression: Regular basketball dribbling throughout the court. No dribbling in end zone (just passing).</p>

Table 4 (cont.)

Name of the game	Games details
Streetball	<p>Concept: Adaptation of football played in a basketball court (invasion game)</p> <p>Setting: Regular basketball court, using the basketball keys as end zones. Play with 2 teams of 5–6 players. Use a football.</p> <p>Scoring: 6 points for a touchdown. Extra points: basket from the free throw (1 point) or basket from the 3-point line (2 points).</p> <p>Progression: 4 downs to get to the end zone: running and passing</p>
Tinezz	<p>Concept: Variation of speedball (game that uses both hands and feet to progress with the ball; invasion game)</p> <p>Setting: Indoor court with walls and no boundaries. 1 soccer goal at each end of the court. Play with 2 teams of 5+ players. Use a dodge ball.</p> <p>Scoring: 1 point for passing the ball to a teammate in the center circle after 3 passes or 1 point for kicking the ball in the goal.</p> <p>Progression: Dribbling with the feet or passing the ball using the hands</p>
Hoopball	<p>Concept: Mix of basketball and football. Player had to get to an end zone to shoot the basket (invasion game).</p> <p>Setting: Regular basketball court with 9 ft 2 in. end zones. Play with 2 teams of 5–6 players. Use a foam ball.</p> <p>Scoring: 1 point for getting the ball in the basket</p> <p>Progression: Running and passing (no dribbling). Players loses possession if tagged with two hands.</p>
Ground Quidditch	<p>Concept: Used a goal similar to Quidditch (Harry Potter’s game) by hanging a Hula-Hoop from the basketball hoop. Goalkeeper with a bat would protect the goal (invasion game).</p> <p>Setting: Indoor court with one goal box of 5 ft 2 in. Play with 2 teams of 4–6 players. Use a foam ball and one bat for each keeper.</p> <p>Scoring: 1 point for getting the ball in the goal</p> <p>Progression: Passing only</p>

Table 4 (cont.)

Name of the game	Games details
The Game	<p>Concept: Knock down cones from the other team's territory. When a cone is hit, a player is eliminated (target game).</p> <p>Setting: Indoor court with 6 cones on each side. Play with 2 teams of 6 players. Use 6 dodgeballs.</p> <p>Scoring: Team that eliminates all other opponents wins</p> <p>Progression: Throw the ball to hit the cones</p>

At the same time, girls were critical of boys' games. According to one ninth-grade girl, boys have a different perception about game play: "They act like this is the Olympics, so if you mess up, they freak out . . . and then it is the end of the world." An eighth-grade girl described the boys' games as being "more sporty," noting that boys' games were more "physical" (suggesting they were more aggressive). When creating their games, boys focused on the promotion of competition and each player's dexterity in performing a specific task (field notes).

As Table 5 shows, boys tended to modify their games to make them more strategic, whereas girls showed more concern toward including everyone in the game. Two examples support this contention. In the first case, the group of girls who created Wall Ball Mix included a rule that every player from the offensive team had to touch the ball before they would score. Equally, the group of boys who created Ground Quidditch modified the goalkeeper's box to establish a balance between offense and defense (to make the scoring goal not too easy or not too hard). Therefore, boys sought to design games that involved a higher skill level and were more strategic, as they enjoyed the competition component of games, whereas girls sought to design games that were easier to play and/or that would ensure everyone's participation to promote a more ludic and inclusive atmosphere while playing.

Table 5*Boys and Girls Groups' Response to Game Design During Focus-Group Interviews*

Answers	Boys groups' response	Girls groups' response
When proposing new rules on your own game or others, what were you trying to do?		
Turn the game more strategic	4	1
Make the game easier for me to play or win	1	3
Include everyone in the game	1	5
If someone could not play my game, it was . . .		
My fault (as a presenter/game designer)	2	5
Their fault	4	2
Undecided/unsure	0	2

Note. There were 15 single-sex groups (6 boys groups, 9 girls groups). Each answer represents what the group decided to answer as a collective.

Discussion

Although the mention of SDG first appeared in the late 1960s by Mauldon and Redfern (1969), there is still little empirical research in this area. Despite the overwhelming literature of gender issues related to PE, little research has focused on gender issues in SDG. Like so many areas in physical education, gender differences play an important role in SDG in both areas that were researched (enjoyment/engagement and game designs) in this study.

Girls reported an interest in experiencing future opportunities to design their own games, which suggests this exposure was preferable to their traditional physical education classes. These findings are consistent with those in the extensive literature reporting that when PE curricula privilege aggressive male students who can dominate team sports activities, girls' participation is compromised (Cockburn & Clarke, 2002; Couturier et al., 2007; Ennis, 1996, 2011). In these classes, girls can be refused to have any form of empowerment (not only physically but also in terms of being able to give their opinion); therefore, they are constantly restrained from participation,

becoming marginalized. SDG create an equity that transcends gender and skill level differences, because students are empowered to create a game that relates to their preferences. Therefore, it is natural that girls enjoy this gain of power in PE, because they can express their opinion and even propose a game that they would like to play.

Although boys showed more concern with promoting competition, and therefore focused on strategic games that encouraged the performance of high levels of particular skills, this competition was not counterproductive to girls' participation. On the other hand, girls showed more concern with designing games that would optimize all players' participation, creating a ludic atmosphere that would not require much skill to play; hence, all participants could take part with higher chances of success.

Of interest, boys and girls had different responses to changing their games. Girls showed greater willingness to change their own game (or make suggestions to other games), focusing on everyone's participation. Boys tried to change their games to make them more strategic. Moreover, girls blamed themselves if other students could not play their game, whereas boys blamed other students. These findings seem to be consistent with those of Hastie and André (2012), who reported that girls were more likely than boys to change their games to accommodate other students' needs.

These differences in reactions may be reflective of the students' previous PE experiences. Although popular American sports such as basketball and football are constantly part of PE classes and may play an important role to keep boys motivated, they may also marginalize girls' participation. Azzarito (2011) called attention to the gendered hidden curriculum that shapes the contexts of schools, praising activities that historically have been predominated by boys and excluded girls. Therefore, the girls' concern for including every student in the game and even avoiding skills that are harder to perform may be a reaction to previous unpleasant experiences that problematized their own participation.

The research confirms previous findings concerning gender differences in SDG. Further research focusing on gender differences in SDG may support teachers on how to approach each gender and enhance their SDG experience.

Although this study provides important insights about gender differences in appreciation, interests, and outcomes in an SDG unit, this study has some limitations in design. First, although some important factors may be analyzed for boys and girls in single-gender groups, the gender literature presents the concept of intersectional analysis (Watson, 2018), acknowledging that neither girls nor boys should be portrayed as a group simply defined by gender alone. The intersectional analysis includes gender, sexuality, race, socioeconomic status, cultural background, and faith. When interacting, all of these characteristics may play different roles on how boys and girls perceive each experience. Although looking at gender differences alone may provide important insights to teachers, simple generalizations should not be drawn. Second, although the majority of students appreciated the freedom of choosing group members, this freedom may have also reiterated gender differences rather than promoting an environment that cultivates a constant conversation that would need more compromises. In other words, when students seek to work with other students with whom they feel more comfortable, this may enhance their differences rather than allow them to learn to work with all students.

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