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A Mixed Methods Research Investigation of Middle School Students' Team Cohesion Development within a Sport Education Season

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**A MIXED METHODS RESEARCH INVESTIGATION OF
MIDDLE SCHOOL STUDENTS' TEAM COHESION
DEVELOPMENT WITHIN A SPORT EDUCATION SEASON**

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Kinesiology

by

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I dedicate this dissertation to my deceased parents, my wife, my three lovely daughters, and my older brother. My father, Shouron Wang, was always a beacon of light for my path forward. Although he has passed away, I firmly believe he is looking at me from heaven to pray for me to be a better man. I would like to thank my wife, Xiaoli Zhang, for her unselfish support and endless love. Thank you my three little sweethearts, Yiwen, Ashley, and Isabella. They are my sources of motivation who constantly inspire me to become a great dad, a good person, a passionate teacher, and a wonderful researcher. Thank you to my older brother, Jianzhong Wang, for always standing behind me.

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Abstract

Team cohesion is critical to the functioning and success of groups or teams. Sport Education (SE) has the potential to develop team cohesion due to its emphasis on authentic, team-based sporting experiences in physical education (PE). The purposes of the study were: (a) to examine the longitudinal changes of team cohesion within a SE season; (b) to identify facilitators and barriers associated with cohesion development. A longitudinal, concurrent, mixed-methods design was employed to address the research purposes. Students from 6th to 8th grades (all girls; n = 76), in small teams (n = 15), and their PE teacher from one convenience private school in a southern United States state participated in this study. All students completed the Youth Sport Environment Questionnaire, to quantitatively measure team cohesion across three time points (early-, mid-, and late-season). Regular field observations, focus group interviews with students, and individual interviews with student leaders and the PE teacher were conducted to capture the facilitators and barriers underlying team cohesion development throughout the SE season. Inferential statistical analyses (e.g., MANOVA, ANOVA) were conducted to investigate the time (early-, mid-, and late-season) and group (effective leadership vs. less-effective leadership) effect for team cohesion. Qualitative data were analyzed to characterize the facilitators and barriers underlying team cohesion development. The findings showed that cohesion development did not show the hypothesized growth but was moderated by student leadership. Qualitative data from multiple methods and sources identified seven facilitators (e.g., positive interaction between teammates, student leadership) and seven barriers (e.g., less-effective student leadership, lack of opportunity to play) contributing or hampering cohesion development. The findings are informative for future SE-based curricular and instructional practices to nurture team cohesion.

Keywords: Learning; physical education; student leadership; social competence; team cohesion

Introduction

Team cohesion or cohesiveness is critical to team functioning and success in group settings such as team sports, work place, and physical education (PE; Silliman & Schleifer, 2018). Team cohesion refers to the bonding relationship among members in a team (Brinkley et al., 2017; Cronin et al., 2018; Glass & Benshoff, 2002; MacPhail et al., 2004; Pan et al., 2019). Sport Education (SE) is a curricular and instructional model that has been applied in PE to educate students to become competent, literate, and enthusiastic sportspersons (Siedentop, 1994). Within a SE season, for instance, students are afforded the opportunity to work in small teams (heterogeneous within but homogenous between teams) to achieve collective goals (Siedentop, 1994). To have a successful season, students must display strong team cohesion when learning with, by, and from each other (Siedentop, 1994). Social competence including social skills and values such as responsibility, collaboration, leadership, citizenship, and friendship, which is considered crucial to team cohesion, which can be developed through healthy social processing within a SE season. However, few prior studies have examined team cohesion in PE, especially in the SE-based PE context.

Team Cohesion and a Theoretical Model

Cohesion is a well-studied construct in domains such as team sports (Casey-Campbell & Martens, 2009), although not so much in PE. Festinger et al. (1963) defined cohesion as two types of forces driving team members united: (a) attractiveness of the group and (b) mediating role of the group for collective goals. Enoch and McLemore (1967) regarded cohesion as intrinsic and instrumental attraction to the group. Cohesion is seen as a dynamic process in which group members tend to stick together and stay united when working toward collective goals and objectives (Carron et al., 1985). Carron et al. (1985) proposed a model with two types of

cohesion: task cohesion and social cohesion; and each type can be further bifurcated into two social perceptions: individual attractions to the group and group integration. The resultant model contains four dimensions: (a) individual attractions to group-task, (b) individual attractions to group-social, (c) group integration-task, and (d) group integration-social (Carron et al., 1985). Based on the Carron et al.'s (1985) theoretical model, Eys et al. (2009) developed the Youth Sport Environment Questionnaire (YSEQ) to specifically target youth populations, which measures two dimensions: task cohesion and social cohesion, since youth populations could not distinguish between individual attraction to group and group integration.

Significance of Team Cohesion

Team cohesion is a significant consideration in a team or group setting, for purposes such as team performance and team members' emotional state. Most of the early studies supported a positive relationship between cohesion and team performance (Chapman & Campbell, 1957; Klein & Christiansen, 1969; Myers, 1962), while several found no or negative relationships (Lenk, 1969; McGrath, 1962). Mullen and Copper's (1994) meta-analysis of 49 studies concluded that there is a small but significant effect of cohesion on team performance. They also found larger effect size in smaller-sized groups than in larger-sized group, and in sports teams than in non-sport groups. A more recent meta-analysis of 55 empirical studies with an emphasis on sports settings revealed a significant moderate to large effect of cohesion on sport performance ($ES = .66$; Carron et al., 2002). This study further observed that: (a). Both task and social cohesion were related with performance; (b). The cohesion-performance relationship did not differ across various skill levels; (c). The cohesion-performance relationship was stronger in female teams than in male teams (Carron et al., 2002). Furthermore, Eys et al. (2015), in a qualitative inquiry, investigated the gender differences in team cohesion and performance. They

recruited 11 coaches from Canada and Germany. Semi-structured interview revealed that cohesion was more beneficial to female teams than to male teams. Their study also highlighted that males were more likely to develop cohesion after successful performance, while females developed cohesiveness toward successful performance. In general, group cohesion was found more difficult to develop in female teams than male teams. Further research is needed to understand the development of team cohesion in female teams.

Factors Influencing Team Cohesion

Many factors may influence the development of team cohesion including, but not limited to, team size, member satisfaction with the opportunities provided by other team member, member similarity, and leadership skill (Widmeyer & Williams, 1991). Widmeyer et al. (1990) found that smaller-sized group showed better task cohesiveness whereas intermediate-sized group exhibited stronger social cohesion. Similarity between group members may be another strong predictor of group cohesion. Members who share more similarities such as religion, race, socioeconomic status (SES) were found to show higher group cohesion, compared to heterogeneous groups (with less similarities; Eitzen, 1973). Leadership skills such as engaging team members in decision-making process, recognizing member's contributions were found to improve team cohesion (Widmeyer et al., 2002). Additionally, Eys and Brawley's (2018) literature review summarized several clusters of factors influencing team cohesion in physical activity settings: personal (e.g., age, gender, self-efficacy), social (e.g., unity and integration level of team), team (e.g., team retention rate, team size), and leadership (e.g., motivating style, individual instruction; Eys & Brawley, 2018). Prapavessis et al. (1996) regarded team cohesion as a by-product of group processes such as group achievement, decision make process, and role clarity. Therefore, the development of team cohesion is a varying and complex process. Of all

the factors identified by the prior research, as summarized above, leadership (e.g., team leaders) appears to be a commonly recognized facilitator (or barrier) underlying team cohesion development. More research is needed to thoroughly capture how teams develop cohesion from a longitudinal perspective. PE based research and practice with a focus on team cohesion development may need to test the potential moderating role of leadership.

The SE Model and Team Cohesion

SE is an innovative curriculum and instructional model that has the potential to facilitate team cohesion by offering authentic and educationally meaningful sport experience into the PE classroom. The assumption of team affiliation feature of SE is based on the substantial evidence that personal growth and social relationship derive from positive sport experiences and persisting team (Siedentop, 1998). SE, as an educational model, further differs from institutionalized sports by avoiding issues such as cheating, corruption, early specialization, unequal access to sport, and inappropriate parental involvement that have plagued organized sports for decades (Siedentop et al., 2019).

In SE, prolonged season and persisting team affiliation create opportunities for students to develop peer relationships and team cohesion (O'Donovan et al., 2010). Early studies showed the effectiveness of SE in promoting social and personal development (Alexander & Luckman, 2001; Grant, 1992). Alexander and Luckman (2001) investigated Australian teachers' perception of using SE curriculum model (N = 377). Compared to the traditional teaching approach, all the primary teachers and over 85% of the secondary teachers perceived that social and personal development such as cooperation and peer interaction skills were associated with more successful achievement in SE (Alexander & Luckman, 2001). The first large-scale SE intervention in New Zealand involved 34 schools with 86 teachers and 2,368 grade 10 students

that were clustered into six groups around the country (Grant, 1992). Most teachers perceived that the competition within a SE season was structured in a beneficial way where students were united within and between teams. Fair competition is the key to promote team affiliation and social and personal development (Grant, 1992). In addition, increased peer interaction prompted cooperation among students, prosocial skills development, and a sense of loyalty (MacPhail et al., 2004).

As summarized above, although prior evidence suggests that SE has the potential to develop social skills and team cohesion, very few empirical studies of SE have focused on team cohesion in PE. Kao (2019) examined the effect of a SE unit on college students' team cohesion using the Team Cohesion Scale, which includes three factors: teamwork, team adaptation, interpersonal interaction (N = 117). The results showed that the SE group (n = 59) significantly improved total team cohesion and its three dimensions, as compared to the traditional teaching group (n = 58). Jenkins and Alderman (2011) incorporated SE into a university PE program where they compared team cohesion in three content courses (i.e., lifetime skill, exercise class, and competitive sport) that followed the SE model. The results showed that the students in the lifetime skill and competitive sport classes exhibited higher group cohesion than those in the exercise class, and that the sport class showed higher social cohesion than lifetime skill class. My literature review only identified one study that has investigated team cohesion in K-12 PE. Based in Taiwan, Pan et al. (2019) investigated the effect of the hybrid TPSR/SE instruction on a variety of outcomes, one of which was team cohesion. Although no significant difference was observed between TPSR-SE group and TPSR-TTM (traditional teaching model) group for the team cohesion score, the TPSR-SE group showed a pre-to-post increase in team cohesion while there was a decreased in the TPSR-TTM group.

Research Purposes and Hypotheses

As synthesized in the above literature review, team cohesion is a significant factor for desirable outcomes such as team success. The development of team cohesion also appears to follow rather complex trajectories for different groups or teams (by gender for instance) across settings (sports vs. other group settings). Most of the existing literature on team cohesion has taken place outside of the K-12 PE context, with only one relevant study conducted in SE-based K-12 PE. Little evidence is available concerning the team cohesion development of female teams in the PE context. This study attempted to fill the research gaps by addressing two research purposes: (a) to examine student (all girls) teams' longitudinal change of team cohesion within a SE season (early-, mid-, and late-season); (b) to identify facilitators and barriers associated with the team cohesion development throughout the SE season.

Two hypotheses were formulated in this study. First, team cohesion would improve as the SE season progresses from early to mid- and late season. I was predicted that the developmental trajectories would vary across teams. Second, as informed by prior research, team leadership was expected to affect team cohesion development, therefore student team leaders' leadership was hypothesized to moderate the development of team cohesion. Specifically, I hypothesized that teams with effective student leadership would increase team cohesion throughout the season while teams with less-effective student leadership would show no change or decrease in team cohesion.

Methods

Research Design

This study employed a longitudinal, concurrent, mixed-methods research design to address the research purposes. For the quantitative aspect, the validated YSEQ was administered at three time points (early-, mid-, and late-season) to measure team cohesion and detect the temporal trend. Qualitative methods including field observations, focus group interview, and individual interviews were conducted to capture the facilitators and barriers of cohesion development.

Setting and Participants

The study took place at a Christian coeducational private school in a southern U.S. state in the fall semester of 2021. The school enrolled 754 grade K-8 students in the 2021-2022 academic year. The students received single-sex (boy only or girl only) PE instruction. The participating PE teacher, Coach Heather (pseudonym), was a certified PE teacher who had over eight years of teaching experience, and had been teaching at the current school for two years. She had been utilizing the SE model in her PE instruction for many years. As a natural experiment, I recruited all students ($N = 77$) who were placed into 15 teams in 6th through 8th grades taught by Coach Heather, 53 of whom (6th grade: $n = 15$; 7th grade: $n = 18$, 8th grade: $n = 20$) submitted parental consent and assent as participants. The study protocol was approved by the LSU Institutional Review Board (see Appendix C) and the administrators of the participating school.

The Team Handball Season

The SE season included 17 lessons using team handball as the sport, which were offered over approximately four weeks following the school's regular schedule. Table 1 shows the scope and sequence of these lessons. The PE lessons were 45 minutes long on Mondays and 60 minutes

on each of the three other days (four lessons per class per week, 225 minutes in total). Eighth grade, seventh grade and sixth grade did not have PE on Tuesday, Wednesday, and Thursday, respectively. The SE season started with an introductory lesson and teacher-directed practice, where the teacher briefly introduced to the history and rules of team handball and demonstrated the fundamental skills of the sport. Teams were formulated equally and fairly in the second lesson based on the teacher's prior knowledge of the students, where team leaders (e.g., captains) were appointed directly by the teacher without election. Since team handball originated in Europe, each team was asked to pick a European country as their team name and the country's main color as team color. The selected team captains were asked to appoint their teammates, who would rotate to assume a variety of roles such as player, fitness leader, equipment manager, referee, and record keeper. In the following lessons, led by their team captains, the teams collectively practiced the fundamental skills and different roles to improve familiarity. The competition phase consisted of preseason games, regular season games, playoff games, and the championship game. Preseason and regular season games followed the round-robin format with teams without competition in each round serving as the duty teams (see Table 1).

Each lesson progressed in a routinized sequence: a) warm-up (led by fitness leaders); b) team practice (led by team captains); c) intra- or inter-team small-sided games; d) cool-down and reflection on playing strategies, fair play, and role responsibilities. A fair-play point system was established and used in each lesson to hold students' behaviors and efforts accountable. Behaviors such as conducting productive practice, giving supportive/positive comments to teammates, cheering for and congratulating team members earned fair play points; while behaviors such as arguing with the referee, trash-talking to opponents or teammates would result in loss of fair play points. The range of fair play points was between -2 to 2 for each lesson as

determined by Coach Heather. A fidelity of implementation checklist was conducted to determine the authenticity of the SE season.

Table 1. The Scope and Sequence of Team Handball Season

Season Stages	Format	Game Time	Activities
Introductory Lessons (1-3)	NA	NA	<ol style="list-style-type: none"> 1. Introduction to team handball. 2. Ball handling (around neck, between the legs etc.) 3. Passing and dribbling drill with a partner (i.e., stationary, moving; switch partner after each drill) 4. Forming teams; team name, color, & poster.
Preseason Games (4-7)	Round Robin	Two halves, 12 min for each half	<ol style="list-style-type: none"> 1. Students in different roles (i.e., team captain, coach, equipment manager, fitness leader, referee, and record keeper) 2. Teacher giving instruction to duty team. 3. Game play. 4. Teacher discussion on roles and responsibilities. 5. Teacher announcing of the results.
Regular Season Games (8-13)	Round Robin	Two halves, 16 min for each half	<ol style="list-style-type: none"> 1. Teacher announcing of the current standing and class competition schedule. 2. Team practice goal and students rotate as goalie. 3. Game play. 4. Switching referee at half time. 5. Playing dynamic music during the competition.
Playoff Games (14-16)	Elimination	Two halves, 18 min for each half	<ol style="list-style-type: none"> 1. Teacher announcing of the current team standing. 2. Teams with the same standing attending free throw competition to break the tie. 3. Teams that did not make to the playoffs as cheer team and duty team.
Championship Games (17)	Elimination	Two halves, 20 min for each half	<ol style="list-style-type: none"> 1. Cheering and poster presentation of each team. 2. Teacher assigning duty teams and cheering teams. 3. Final competition. 4. Duty and cheering teams switched at halftime.

Instrumentation

Quantitative and qualitative measures were administered for data collection. Table 2 lists these measures and timing, which are described in detail in the following section.

Table 2. Instrumentation Types and Timing

Instrumentations	Days				
	1-5	6-10	11-15	15-18	19-21
Cohesion: YSEQ	×		×		×
Facilitators and Barriers					
Observations	×	×	×	×	×
Focus group Interviews*		×		×	
Student Leader Interviews*		×		×	
Teacher Interviews	×		×		×

Note. *purposely selected 4 team and their leaders for focus group and student leader interviews; YSEQ = Youth Sport Environment Questionnaire.

Team Cohesion

Team cohesion was measured using the YSEQ (Eys et al., 2009). The YSEQ is a psychometrically sound questionnaire to measure team cohesion for youth athletes. The questionnaire consists of 18 items to assess two dimensions of team cohesion with two negatively worded spurious items. The questions and choices are shown in Appendix B. Specifically, task cohesion is measured by eight items (i.e., #1, #3, #5, #8, #10, #14, #16, #18). One example question is phrased as: “As a team, we are all on the same page.” Social cohesion is measured by eight items (i.e., #2, #4, #7, #9, #11, #13, #15, #17). One example question is phrased as: “I invite my teammates to do things with me.” Cronbach’s alpha (α) and confirmatory factory analysis were performed, which verified the sound internal consistency (task cohesion: $\alpha = .93$, social cohesion: $\alpha = .90$ at T1; task cohesion: $\alpha = .94$, social cohesion: $\alpha = .93$ at T2; task cohesion: $\alpha = .95$, social cohesion: $\alpha = .96$ at T3) and goodness of fit ($\chi^2 = .13$, $p > .05$; CFI = .99; TLI = .99; RMSEA = .04) of the YSEQ using the data collected from the present sample.

Facilitators and Barriers

To address the second research purpose, multiple qualitative methods were employed to explore the facilitators and barriers of team cohesion development, including field observations, focus group interviews with students, individual interviews with student leaders, and individual interviews with Coach Heather.

Field Observations. As shown in Table 2, I observed each PE class once per week to provide a rich description of the SE season and how the student teams socialized together, to capture the facilitators and barriers of team cohesion development. Appendix A shows the protocol that I used to conduct the field observations. Based upon the research purpose and Coach Heather's suggestions, I purposely selected four teams: one in sixth grade (team 14, n = 3), one in seventh grade (team 9, n = 4), and two in eighth grade (team 1, n = 2; team 2, n = 5), as my observational focuses. Except one eighth grade team was selected based upon the possible effective leadership, all other teams were selected based upon their willingness to share deep information during interviews as informed by Coach Heather. These four teams were subsequently selected for focus group student interviews and their student leaders for individual interviews. These observations at the research site not only generated rich, observational data to inform team cohesion development, but also enabled me to triangulate data collected using other methods (i.e., to improve trustworthiness). Students' attendance, cooperation, leadership, performance and engagement in each role, taking responsibility, conflict resolution, and team spirit were all recorded to further identify the facilitators and barriers of cohesion development.

Focus Group Interviews with Students. Four teams aforementioned were purposely selected to conduct focus group interviews respectively, once in early-mid season and once in late season. The focus group interviews followed an interview guide as shown in Table 3. In

order to have a deep understanding of the team cohesion development, most of these questions were not only informed by two sub-dimensions of YSEQ, but also informed by other three sub-dimensions summarized by Salas et al.'s (2015) literature review, which included belongingness, group pride, morale, and psychological cost as identified by Prapavessis and Carron (1996).

Table 3. Focus Group Interview Guide

<p>Thank you for agreeing to participate in the focus group interviews. The purpose is for me to understand your experiences in PE. This interview will take about 15-20 minutes. To make sure I hear clearly what you say, I would like to record our conversation. Is that okay? [upon permission] All information collected from interview will be kept confidential and anonymous. Thank you.</p>

<p>Greetings & casual warm-up conversations (routines).</p> <ol style="list-style-type: none"> 1. Please tell me what does it like for being on a team. (enjoyment, pride, reluctance, excitement, boring, etc.) 2. Have you made friends in the team? (please share stories of you and your friends) 3. How do your teammates feel about being on their team? 4. How do you feel about your teammates' determination to win? (desire to win, effort, sacrifice for winning) 5. What are your thoughts about the opportunities your team provide to everyone? (equal playing time, support from teammates etc.) 6. About your team, do you feel you are an important part of your team? Please tell me about it. 7. Do you feel your team is working together to winning games? (reason) 8. When you lost a game, did you figure out the reasons? Can you please elaborate? 9. Let's talk about your team captain or coach, any comments on them? Do you think they play a key role for team success? Elaborate. 10. Do you feel pressured in competition? Describe these pressures please. (fear of losing, fear of letting teammates down, fear of receiving low grade, etc.) 11. Have you felt or experienced any conflict in the season? (winning the game vs maintaining a good relationship). If so, how did you and your teammates resolve it? 12. That concludes my interview. Do you have anything to add to the conversation that we didn't get to discuss today? <p>Thank you for participating in the interview! If there is anything else you like to add, please email those to us (bwang34@lsu.edu).</p>
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Individual Interviews with Student Leaders. Student leaders' effective leadership skills were hypothesized as one of the essential elements to affect team outcomes and successful implementation of the SE curriculum (Wallhead & O'sullivan, 2007). I conducted student leader interviews with four team captains of the purposely-selected teams, to gauge their lived

experiences of leading their teams throughout the season, once in early-mid season and once in late season (see Table 2). These interviews followed an interview guide as shown in Table 4.

Table 4. A Guide for Individual Interviews with Student Leaders

<p>Thank you for agreeing to participate in the interview. The purpose of this interview is for me to understand your experiences in PE. Each interview will take 10-15 minutes. To make sure I hear clearly what you say, I would like to record our conversation. Is that okay? [upon permission]All information collected from interviews will be kept confidential and anonymous. Thank you.</p>
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<p>Greetings & casual warm-up conversations (routines).</p> <ol style="list-style-type: none"> 1. What is it like to be a captain/coach? (Did you like it? Any challenges? Etc.) 2. Let's talk about your teammates' expectation of you. Do you feel your teammates have reasonable expectations on you as a leader? Elaborate. 3. Do/Did you experience any peer pressure from your teammates? Please describe. 4. How do you view these pressures and how did you cope with them? Can you please tell me a little about how your team work together? (Tactics, techniques, playing style, etc.) 5. How do you evaluate your team results? (Success, struggles, failures) 6. How do you evaluate your leadership in providing opportunity for your teammates? (Equal playing time, support from teammates etc.) 7. Have you felt or experienced any conflict in the season? (Teammates working together, not following directions, dispute in games). If so, what did you do to resolve it? 8. Did you do anything in particular to unite your teammates in working toward team goals? (Elaborate please) 9. Tell me about your relationship with your teammates, do you hang out with them after class? How often? What do you usually do? 10. Are there any areas or things that you feel you need to improve as the leader? Elaborate. 11. That concludes my interview. Do you have anything to add? <p>Thank you for participating in the interview! If there is anything else you like to add, please email those to us (bwang34@lsu.edu).</p>
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Individual Interviews with the Teacher. Three formal individual interviews (early, mid, and late season) and a series of informational, conversational interviews (along with my weekly observations) were conducted to gauge the Coach Heather's perspective on team cohesion throughout the season. The teacher's SE-related instructional experience and value orientations, her formative implementation of the SE, as well as her opinions with regard to team cohesion and social competence were collected at the first interview. Her reflective thoughts about teaching strategies and her capability of promoting team cohesion as well as her evaluation of student leadership were collected at the second and third interviews. The formal interviews

followed the interview guide as shown in Table 5. Informational teacher interviews were conducted to best understand the entire implementation process of the SE season.

Table 5. A Guide for Individual Interviews with the Teacher

<p>Thank you for agreeing to participate in the interview. The purpose of this interview is for me to understand your teaching experiences in PE. Each interview will take about 15-20 minutes. To make sure I hear clearly what you say, I would like to record our conversation. Is that okay? [upon permission] All information collected from interviews will be kept confidential and anonymous. Thank you.</p>
<p>The FIRST Interview:</p> <p>Greetings & casual warm-up conversations (routines).</p> <ol style="list-style-type: none"> 1. Why are you so fond of the Sport Ed model? Elaborate your related experiences. 2. In your views, what does team cohesion or cohesiveness mean? 3. What do you think about the potential of the Sport Ed in building team cohesion? 4. How did you put the students into groups for the season? 5. How are/were the team leaders arranged? (Appointed by you? Election?) 6. What do you value the most as a PE teacher? (Probe on knowledge of most worth: skill acquisition, knowledge understanding, physical activity and fitness level, social competence). 7. Any thoughts on which teams are going to work well together and which teams not so much? <p>Thank you for participating in the interview!</p>
<p>The SECOND AND THIRD Interviews</p> <p>Greetings & casual warm-up conversations (routines).</p> <ol style="list-style-type: none"> 1. How is the season going? 2. Can you please comment on how students have been working together within teams? 3. Which teams are working well together? And which one not so much? 4. Since the last interview, did you see any improvement in team cohesion in any of the teams? Elaborate please. 5. What are some facilitators or barriers for the students to work together? 6. How do you see the roles of student leaders? Can you give some good and bad examples? 7. What are some strategies that you have used to help students improve team cohesion? 8. To what extent are you satisfied with the season and how students have done in the season? <p>Thank you for participating in the interview!</p>

Data Collection and Analysis

To address the first research question, I conducted a checklist to report the fidelity of the teacher implementing the SE season, followed by descriptive statistical analyses (i.e., N, Mean, Standard Deviation [SD]) of team cohesion (task and social dimensions; total cohesion) across three time points (early-, mid-, and late season). The average cohesion scores (task dimension,

task dimension, and total cohesion) at the three time points were graphed using line charts to depict their changing patterns. I then conducted a repeated measures Analysis of Variance (ANOVA) to investigate the time effect for team cohesion across the three time points, followed by a Multivariate Analysis of Variance (MANOVA) to test the time effect for the two cohesion dimensions. To further analyze the potential moderating effect of student leadership on team cohesion development, student teams were divided into effective team leadership vs. less-effective team leadership groups, as informed by the observation and teacher interview data. Table 6 shows an example on how effective vs. less-effective team leadership groups were categorized. These resultant groupings were subsequently verified by Coach Heather, the primary informant, who had most experiences interacting with the students. Subsequently, repeated measure MANOVA was conducted to examine team cohesion change by student leadership. Bonferroni post-hoc multiple comparison tests were conducted to test differences across more than two groups. Prior to the inferential statistical analyses, statistical assumptions, including normality and homogeneity of variance were tested. Partial eta square were reported as effect size, and significant level was set as alpha of .05.

Table 6. References for Effective Student Leadership

Team with Effective Students Leadership	Source	Example Quotes
Team 1 (eighth grade)	Teacher interview 1 (Supported by Observation data)	For eighth grade I do feel that Cathy (captain) is the most competitive out there. She is not afraid to tell people what to do. So she'll put together good plays, usually she's very good at the tactical parts of the games, and organizing her team on defense and offense.

(table cont'd)

Team with Effective Students Leadership	Source	Example Quotes
Team 8 (seventh grade)	Teacher interview 1 (Supported by Observation data)	For seventh grade, team with Anna as their team leader..... Anna, she's just the strongest leader out of the whole class. I think that Team 11 for sixth grade has come together a lot. Their captain and coach are really strong together. Team 12 made it to the championship game in that group that Joly is the leader for that group. She always plays 100%. She really leads well with her actions.
Team 11(sixth grade)	Teacher interview 3	
Team 12 (sixth grade)	Teacher interview 3	

Note. To keep the confidentiality, all the team names and leaders' name mentioned by the teacher were replaced by team number or pseudonym.

To address the second research question, qualitative data collected through field observations, focus group interviews, and individual interviews were analyzed using open-, axial, and selective-coding (Creswell & Poth, 2016). Interview conversations were transcribed into verbatim, and observation notes were typed into the data processing computer. Both deductive and inductive data analysis were adopted to capture the facilitators and barriers of the team cohesion development. Nvivo 12 was used to process the qualitative data, where I ran the word frequency query function to visualize the frequency and popularity of words/phrases being cited by the participants as well as the three steps of data coding. All the participants were given pseudonyms to protect their confidentiality. Interview data were member-checked and data collected from multiple qualitative methods were triangulated to improve trustworthiness.

Results

Implementation Fidelity Check

Knowing the implementation process of the SE season is crucial to determine whether the potentially observed changes in team cohesion could be attributable to the experiences offered by the team handball SE season. Implementing an authentic SE season at a full scale would probably have a positive impact on students' engagement and learning (Schwamberger & Curtner-Smith, 2017). Table 7 showed that the teacher faithfully implemented most of the essential elements of the SE model throughout the team handball season (all but four = "Ys"). The mixed methods data from field observations and various interviews led to the decisions of Y (yes, available) or N (no, not available) for the presences or absences of these SE elements within the season.

Change Trajectory of Team Cohesion

To address the first research purpose, I examined the longitudinal changing trajectory of team cohesion within the SE season. Figure 1 shows the line charts of team cohesion (i.e., task cohesion, social cohesion, total team cohesion) distribution by time (T1, T2, T3). These detailed results are also reported in Table 8. Task cohesion, on average, was higher than social cohesion at all three time points. ANOVA with total team cohesion as the outcome variable did not show statistically significant time effect ($F_{2,46} = .145$, $p = .87$, $\eta_p^2 = .006$); nor did the MANOVA with task cohesion and social cohesion as outcome variables (Wilks' $\lambda = .96$, $F_{4,44} = .42$, $p = .79$, $\eta_p^2 = .037$). These results indicate that team cohesion, on average, did not significantly change over the three time points.

Table 7. Checklist of the Implementation of a SE Season

The Benchmark Elements		Check
The teacher plans the unit around the principle of a “season”	Management/organizational phase	Y
	Team selection phase	Y
	Pre-season scrimmage phase	Y
	Regular season phase	Y
	End of season event	Y
The teacher promotes the ‘affiliation’ concept	Students involved in the process of team selection	N
	Persisting teams for duration of unit	Y
Teacher promotes students taking ‘responsibility’	Incorporates student duty roles within lessons	Y
	Establishes contract and/or accountability for student performance in roles	N
	Teacher holds student accountable	Y
	Teacher provides training for referees	Y
	Teacher utilizes tasks to train students on effective verbal communication and feedback	Y
	Teacher provides task sheets for coaches/captains	N
	Teacher adopts a facilitator approach during interactions with student groups	Y
	Teacher encourages students to resolve conflict within groups	Y
Teacher uses ‘formal competition’ within unit plan	A formal schedule of competition is established	Y
	Fair play and sportsman awards utilized	Y
Teacher utilizes a form of ‘record keeping’ within unit	Teacher provides rubrics for scorekeeper	N
	Incorporates peer assessment as part of record keeping process	N
Teacher uses ‘culminating event’ near the end of the season	Culminating event is festive in nature	Y
	Teams are easily identifiable (team names, team colors, team t-shirts)	Y
Teacher creates ‘festivity’ within unit	Regular postings of team/individual performances	Y
	Teacher emphasizes the celebration of fair play	Y

Note. The checklist was developed by Ko et al. (2006) and the last four questions were supplemented by Sinelnikov (2009). Y = Yes; N = No

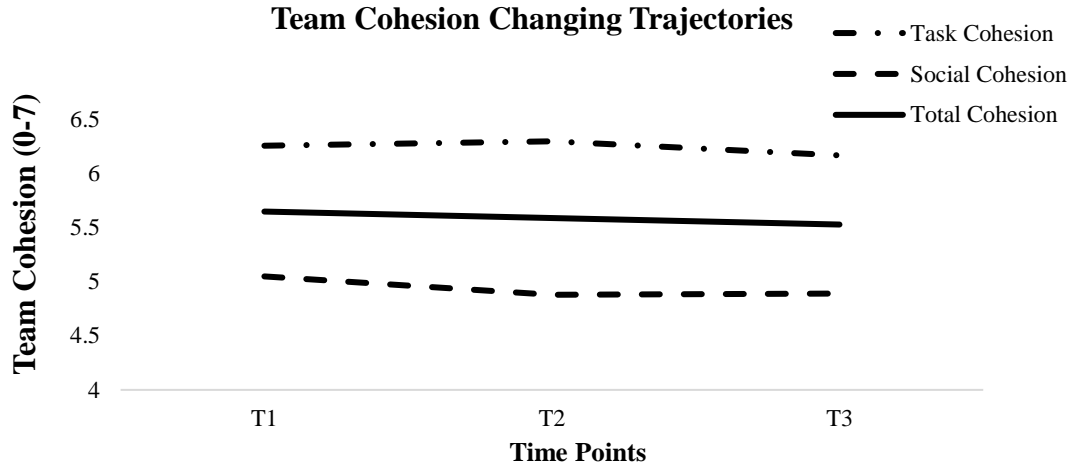


Figure 1. Team Cohesion Changing Trajectories by Time.

Table 8. Descriptive Results of Team Cohesion across Three Time Points

Cohesion Type	Time Point	M	SD	N
Task	T1	6.26	1.65	48
	T2	6.30	1.58	48
	T3	6.17	1.75	48
Social	T1	5.05	1.50	48
	T2	4.88	1.75	48
	T3	4.89	2.08	48
Total	T1	5.65	1.42	48
	T2	5.59	1.54	48
	T3	5.53	1.75	48

Student Leadership as Moderating Factor

Prior research and my field observation data informed me to test the potential moderating effect of team leaders' leadership (effective vs. less-effective) on the changing patterns of team cohesion. I conducted a repeated-measure two-way (time by leadership) ANOVA with total team cohesion as the outcome variable, which did not show significant interaction effect ($F_{2,45} = 1.449$, $p = 0.25$, $\eta_p^2 = .061$). Further, repeated measure MANOVA with social cohesion and task cohesion also did not show significant time by leadership interaction effect (Box's $M = 24.662$, p

= .48; $\lambda = .83$, $F_{4,43} = 2.167$, $p = .09$, $\eta_p^2 = .168$). However, repeated measure ANOVA with task cohesion from T2 to T3 showed significant time by leadership interaction effect ($\lambda = .92$, $F_{1,48} = 4.074$, $p = 0.049$, $\eta_p^2 = .078$) as well as significant time by leadership interaction effect from T1 to T3 ($\lambda = .92$, $F_{1,50} = 4.207$, $p = 0.046$, $\eta_p^2 = .078$) where teams with effective student leadership showed growth of task cohesion while the teams with less-effective student leadership showed decline of task cohesion. As shown in Figure 2, student leadership played an important moderating role in team cohesion development, particularly for task cohesion. The importance of student leadership to cohesion development was further supported by qualitative results as presented in the next section.

Facilitator and Barriers Underlying Cohesion Development

Multiple methods data (i.e., interviews, focus group interviews, observations) from several sources (i.e., PE teacher, students, student leaders) were collected to address the second research purpose. Figure 3 showed the word frequency query results of the qualitative data. As shown in Figure 3, the most frequently cited words, in relation to facilitators or barriers, were team ($n = 408$), together ($n = 143$), win ($n = 117$), leader ($n = 82$), friends ($n = 47$) and pressure ($n = 47$). These cited words, upon deductive and inductive analyses of all other qualitative data, were further categorized into facilitators and barriers. These factors and their frequencies are presented in Table 9.



Figure 2. Changing Trajectories of Team Cohesion (social cohesion, task cohesion, total cohesion) across Time (T1-T3) by Team Leadership (Effective vs. Less-effective)

Student leadership emerged as a prominent factor in both observation and interview data (total tally = 51; mentioned by Coach Heather 11 times), as a facilitator (i.e., effective student leadership) or barrier (i.e., in-effective or less effective student leadership), underlying team cohesion development. Interview data revealed that the student leaders had improved their understandings of the leadership roles. Student leadership was reported more frequently as a facilitator in the second focus group interview (n = 9) than in the first focus group interview (n = 4); while it was also referred more frequently as a barrier in the second focus group interview (n = 5) compared to the first focus group interview (n = 2).

Facilitators

This study identified seven facilitators from the multiple qualitative data: positive interaction between teammates, effective student leadership, whole team mentality, winning and the determination to win, the essential feature of SE, teacher's familiarity with students and teaching strategies, and school environment.



Figure 3. The Word Frequency Query Results of the Qualitative Data

Table 9. Categories and Reference

Factors	Categories	# of Citations
Facilitators	Positive Interaction between Teammates	45
	Student leadership	31
	Whole team mentality	10
	Winning and the determination to win	10
	The essential features of SE	6
	Teacher's familiarity of students and unique teaching strategies	2
	School environment.	2

(table cont'd)

Factors	Categories	# of Citations
Barriers	Student leadership	20
	lack of equal opportunity to play	10
	Immaturity	10
	Personal life in and outside of PE	7
	Complaining and confusion on task	5
	Self-inflicted Pressure	3
	Lack of communication	3

Positive Interaction between Teammates. Positive interaction between teammates such as social support, mutual trust and understanding was the most prominent facilitator (n = 45) for team cohesion development, as supported by the data (see Table 9). Andie, a seventh grader on a less-effective leadership team, expressed in the first focus group interview that: “You feel you can rely on people... like closeness to them because you feel you can trust them.” The mutual understanding between teammates was not only established in the social cohesion domain, but also in the task cohesion domain. As the students played more games later in the SE season, they gradually knew each other’s strengths and weaknesses. Catlin, a seventh grader on a less-effective leadership team, for instance, recognized this and voiced in the second focus group interview that: “Since we played a couple of games we know everyone's strengths and weaknesses..... right down the court we know when to put people in, take them out.”

Effective Student leadership. Effectiveness of student leadership could considerably influence the development of team cohesion. The importance of student leadership was fully reflected in the teacher interviews and field observations. For example, Coach Heather stated, “If the team leader isn’t being the vocal leader ..., there's not as much of an influence to do the right thing.” When asked which team would perform better at each grade level before the beginning of the SE unit, two out of three highly anticipated (by Coach Heather) teams ended up performing well (all three teams made to the semi-finals; one won the championship) and higher anticipated

performance linked with having an effective team leader. Coach Heather also acknowledged in the second interview (mid-season) that team leadership was a major facilitator of team cohesion: “I think that Team 11 has come together a lot. Their team leaders, Ryan and Joanie, and their team are really strong together.”

Coach Heather also pointed out that the inclusiveness of less-skilled students, during a competitive SE season, was a major factor for team success. “I’ve noticed that they (Team 11) got a lot better in terms of getting those other girls that don’t necessarily have the most athleticism; they got them involved more; and that’s helped their team out a lot.” (The third individual teacher interview)”.

Student leaders with teamwork mentality facilitated team cohesion development. For example, when being asked “how does it feel to be a team leader”, Cathy (a less-effective leader of an eighth grade team) shared their opinions about the importance of having a teamwork mentality as team leaders.

Cathy: I think it's very fun. And I also think it's very encouraging, because it kind of gives you a boost. It helps you to teach other people, which makes you feel good about yourself.

Nancy: It feels great. It feels good to be in charge. And it feels good to show other people how it goes and stuff. And it feels good to be able to say, “Okay, guys, now let's go and try and do this.

Despite both acknowledging teamwork mentality as important, their responses also showed some subtle differences in leadership. Cathy had a sense of responsibility to help other students to grow, while Nancy’s response suggested that her understanding of the leader was to be in charge and control other students. Their distinct responses also reflected the different developmental stages of those in lower versus higher middle school grades (sixth vs eighth), which also reflected in the interview with Coach Heather.

Coach Heather: I definitely think a lot has to do with maturity, and maturity in sport as well. Because the majority of the girls in eighth grade played sport and outside of PE. They know what it's supposed to look like. The sixth and seventh graders, I don't really think they know what a good team (and a good team leader) is supposed to look like. (The second teacher interview).

Whole Team Mentality. Whole team mentality (n = 10) was identified as an important facilitator during the SE season. This mentality refers to everyone on the team having a sense of teamwork spirit and being willing to help each other. Catlin was a good team player who spoke on the topic of the whole team mentality in the second focus group interview:

I don't know whether I'm an important part, but I'm not the only part. And I'm sure we all know that I'm an important part and everybody else on the team is an important part. And if one person is gone, it doesn't work as smoothly. But we all know that we're not the main part of the team. Because there's no "I" in "team" and you will have to work together. You can't work separately.

Winning and the Determination to Win. Winning and the determination to win was another frequently cited facilitator (n = 10) as identified in the data. As Coach Heather said at the second interview, "without the determination to win, team cohesion has nowhere to go." A winning streak would make students feel proud being on the team that would not only confirm their contributions to the team, but also validate their self-value. During the second focus group interview, several students on the eighth grade team (who won the championship later) exhibited a strong determination to win.

Ali: Yeah, I really like it. I'm pretty sure we won every game. So we kind of dominate it. I do think that we're all competitive, because we all really like to win. And we love the feeling that when you're winning, that accomplishment feeling.

However, another team of eighth grades that lacked of determination and effort to win did not develop great team cohesion; nor did they show positive performances. One team member Rudi, an eighth grader on a less-effective leadership team, said: "I feel it just depends on

the person and how badly they want to win, because I feel like there are some people that kind of cut some slack, I know for me, if we're losing by a lot, I just kind of give up.” (The second focus group interview).

The Essential Features of SE. The essential features of SE were frequently cited as facilitators ($n = 6$) to the development of team cohesion, although the students may not have necessarily known of the exact SE-related terms. Festivity features such as team name, team cheer, mascot, and posters helped teammates to come together in the first place. As Coach Heather said:

I think when they can all agree on the things that aren't necessarily about the sport first, that helps them come together on agreements that are related to this sport. So if it's about the team cheer, or just the mascot, or the posters, if they decide and work together well on that stuff that's not related to the sport, I feel that really helps them come together more on the court, just because they already started listening to each other and respecting each other's opinions. (The third teacher interview).

Team affiliation feature and the prolonged season also contributed to the development of team cohesion. Students expressed enjoyment being on a cohesive team. For example, Emmy, a seventh grader on a less-effective leadership team, said: “We enjoy being on the team together. And even it's tough at the beginning, because you may not have a bunch of friends on the team, we always end up making friends and you learn how to work together.” (The first student interview).

In addition, assuming different roles enabled students to fulfill self-value through multiple tasks. Britany (eighth grade, less-effective leadership team) voiced that: “It kind of fits with your spot when you're playing equipment manager, good at certain things. It's kind of weird how it works.” (The first focus group interview). The authentic sport experience (e.g., formal competition) that the SE model brings to the PE class also facilitated the team cohesion development. Lindy (eighth grade, less-effective leadership team): “There's a great way

experiencing what people act like when they're getting competitive. And then, people learn how to talk to one another when they're actually trying to go for a common goal.”

Teacher’s Familiarity of Students and Teaching Strategies. Coach Heather had been utilizing the SE model for many years, teaching at the school for over two years, and teaching the participating students since they were fifth grade. Therefore, she was very familiar with the model and the students, especially those in seventh and eighth grade students. Coach Heather’s familiarity of students was an advantage when she was using teaching strategies such as team building strategy in instruction, which subsequently enhanced students’ team cohesion development. As Coach Heather stated in the first teacher interview: “I usually split students up by skill level after watching them in training camp, and make sure that we don’t have five very skilled players on one team and five not so skilled players on another. ... But sometimes, by personality and social behaviors when they work with different students.” Coach Heather was previously an athlete who played a number of sports at competitive levels. She also had been coaching team sports (e.g., basketball) for many years. She believed SE was the best instruction model to promote girls’ lifetime sport participation.

School Environment. School environment was also a factor acknowledged in student interviews (n = 2). The participating school is a Christian coeducational school. Respecting and cooperating with others are rooted in every aspect of the school activities, which indirectly contributed to the development of team cohesion. Andie (seventh grade, less-effective leadership team) said in the first focus group interview that: “We just work really well together. I think we should wear Christ like mood or character trait.”

Barriers

This study also identified seven barriers (N = 38) hampering the development of team

cohesion throughout the SE season. These perceived barriers included ineffective leadership, no equal opportunity to play, immaturity, personal life in and outside of PE, complaint and confusion on task, self-inflict pressure, and lack of communication. However, the number of barriers seemed to dwindle as the season unfolded in some groups (e.g., the more cohesive teams) or roles (e.g., team leaders). For example, the student leaders reported facing more barriers at the second interview (n = 9) compared to at the first interview (n = 2).

Ineffective leadership. Ineffective leadership was reflected in student leaders' lacking of capability to include marginalized students and lacking of prior sport experience and knowledge. It is important for student leaders to be inclusive of marginalized students (e.g., the less-skilled students) during their leadership. Otherwise, a non-inclusive environment would hamper cohesion development and team performance in general. For example, Susan (sixth grade student from a less-effective leadership team) was a less-skilled student. She lacked confidence and did not seem enjoy playing team handball, as verified twice in her interview responses: "I'm just really bad at this. I am just very bad at sports." (The first focus group interview). Nancy was the leader of the team, of which Susan was a member. Observation data showed that Nancy was very competitive and had a strong determination to win. However, she did not properly include the less-skilled students such as Susan. Susan felt intimidated by her, which was reflected multiple times during her interview responses. Susan said: "She (Nancy) gets really mad when our team loses." (The first focus group interview); "Susan, I'm looking at you (impersonating Nancy's voice)." (The first focus group interview); "I think she (Nancy)'d beat me up if we didn't win (The second focus group interview)."

Because of the negative experience interacting with her non-inclusive team leader, Susan did not develop a sense of belonging to the team. When asked whether she received support from

teammates, she said “You don't get support. No.” (The second focus group interview). She thought everybody hated her. When asked whether she was afraid to let her teammates down, Susan said “I don't really get the ball, and if I do, I just give it to them, so I never really gets that feeling.” (The second focus group interview). When Nancy reflected on her leadership, she confessed that she needed to control her temper sometimes:

I think that I need to be a little bit more clam. I'm a little bit stressed, because sometimes when the other team has two more points, the game is about to end, I kind of talk a little bit louder, because I'm a little bit scared that we might lose.” (The second student leader interview).

Student leaders' previous sport experiences and knowledge about the sport were found to be the important factor related to student team leadership, underlying the development of team cohesion. For example, Cathy was a very competitive girl who had played multiple sports. She was on the varsity basketball team. Her sport talent and athletic capabilities were recognized by her teammates. For example, her team member Ali said: “She's very competitive, but she's balanced. ... Also, she's very analytical. She can really see what we need to work on.” (The first focus group interview). On the other hand, Bella was a leader of a seventh grade team, who was new and just transferred from another school. She did not have much sporting experience before this team handball SE season. She was a good leader outside of PE, but she had a hard time playing and understanding the game. Coach Heather shared with me in her second interview:

She (Bella) went to a school that was like a visual performing arts school. So there was no focus on athletics really there. ... She knows how to lead groups when they work on school projects, or like the poster or different things outside of sports well, but knowing how to organize a team in warm ups and different things like that is like a foreign concept to her. I think her teammates don't really trust her. And that makes her not really trusting herself as well.

Likewise, Bella's teammates also expressed some dissatisfactions about her role due to her lack of understanding and experience of sports (e.g., team handball and other sports). For

example, Catlin, Bella's team member stated: "I think she is a good leader, and she tries to build us up. But sometimes she likes to push people (physically), and we kind of get upset about that."

Lack of Equal Opportunity to Play (n = 10). Every student deserves equal opportunities to play and should have the equal right to acquire skills and tactical awareness from game play when learning a sport (e.g., team handball). Providing students with equal opportunity was a corner stone of team cohesion development in PE setting. Britany (eighth grade, less-effective leadership team) complained that: "We need to work on a rotation and subbing out, because there's some people that sit out for 10 minutes, and there's some people that never go out. So we need to work on that. That's our main problem." (The second focus group interview).

Immaturity. Immaturity (n = 10) is another factor related to the development of team cohesion. In this study, a pronounced grade level difference in cohesion development was observed, which was substantiated by Coach Heather in the second teacher interview.

I feel like they kind of already know how to work together, at least some of the older girls. The sixth graders, they're still trying to figure it out. And it's not as cohesive because they don't really see the benefits of working well during play of the games. They haven't really reached that skill level yet.

Personal Factors. Student's personal factors was also a frequently cited barrier (n = 7), which had significant influence on their interactions with other teammates and on their efforts on court. When talking about the only game that the champions of eighth grade lost, a team member, Mary, said "I felt that day was not for me, and also kind of felt Cathy (team leader) was kind of down." Ali, another team member, also said "Yeah, I could feel everybody was kind of just like it is one of those days. It's just tired and stressful." Coach Heather in the second teacher interview also stressed this point:

I think sometimes they maybe had a bad day, and they don't want to participate because of something that happened two hours ago. They carry a lot of things with them, and they may just decide they want to shut off or if they're mad at somebody, because of what they

said earlier in the day or earlier that week, then they don't want to even engage with that person.

Complaint and Confusion. The students' reported complaints and confusion on tasks (n = 5) led to arguments or disagreements between teammates, which undermined cohesion development followed by poorer performance. Lindy, a team leader of an eighth grade, less-effective team stated that: "Normally, we work together pretty well. And we're all in sync. But for some reason, this past game, there was a little bit confusion of where to pass the ball, and how fast to pass the ball." (The second student leader interview).

Self-Inflicted Pressure. Self-inflicted pressure (n = 3) was another barrier that impeded the development of team cohesion, especially for the less-skilled students. Ode, an eighth grader on a less-effective leadership team was less skilled, and was disengaged or less engaged during team practice or competitions. She kept silent most of time during the interviews. At one moment, Ode broke the silence.

I pressure myself a lot. I think that the team is probably better without me. I feel I'm not going to do the best for the team. So I try to come up with myself out. I feel the pressure to make my teammates happy. I feel they're going to be happy without me being there. Because I feel they get to play more and then I don't really get passes from them lots of times because I just kind of go off, because there's no point of me being there. I don't really do very much. (The second focus group interview).

Self-inflicted pressures and the related psychological experiences as voiced by the less-skilled students such as Ode are concerning and should be addressed in PE and sports.

Lack of Communication. Lack of communication (n = 3) between teammates created distrust and misunderstandings, limiting team cohesion development. Andie (seventh grade, less-effective leadership team) said in the second focus group interview that: "Maybe we need to talk a little bit more because I know, we're all little bit shy sometimes."

Discussion

The findings of this mixed method study addressed two research questions: (a) to examine student teams' longitudinal change of team cohesion within a SE season; (b) to identify facilitators and barriers associated with the team cohesion development throughout the SE season. These findings are discussed below.

For the first research purpose, although the quantitative results did not support the hypothesized upward changing pattern of team cohesion development across three time points and the 15 teams demonstrated varying change trajectories, teams with effective student leadership exhibited considerable increase in team cohesion from pre to post ($\Delta M = 0.24$), especially for task cohesion ($\Delta M = 0.57$). Teams with effective student leadership increased task cohesion across three time points while teams with less-effective student leadership demonstrated a declining trajectory ($p < .05$). Interestingly, the most pronounced difference on task cohesion changing trajectory happened between T2 and T3. The findings suggest that effective student leadership may have a positive influence on team processing and functioning toward tasks such as establishing practicing routines, introducing team-playing strategies, presenting, assigning, and completing tasks, particularly from mid-season (T2) to late-season (T3). Being cohesive as a team from mid- to late-season was crucial to team performance and success, as it is when winning and losing games became more important, determining how well the teams would be placed. The finding of this study confirmed the previous research evidence that positive relationships existed between student leadership and task cohesion. Shields et al. (1997) found both perceived and self-reported leadership were positively related to team cohesion. Among them, the relationship between perceived leader behaviors and task cohesion was the strongest one. Callow et al. (2009) found that leadership behaviors such as improving

students' acceptance of team goals, encouraging team work and team spirits, and having higher expectation on team performance significantly predicted task cohesion, which also aligns with the qualitative results of this study.

The role of leadership in fostering team cohesion development has been well studied in military (Bartone & Kirkland, 1991), therapeutic settings (Antonuccio et al., 1987), and sports psychology (Callow et al., 2009). This study is the first to examine and identify a positive relationship between student leadership and task cohesion in the context of PE (SE-based PE) setting. One possible explanation of the positive relationship between leadership and task cohesion is the function of effective student leadership in motivating all team members (marginalized students included). According to the transformational leadership theory (Bass, 1985), transformational leaders motivate followers to exceed themselves by shaping their beliefs and attitudes. Based on observation data, for example, the leader of the championship team in eighth grade did a fantastic job to include and motivate the less skilled players in every aspect of team activity, while the other eighth grade team did not successfully motivate and involve those less skilled players and therefore did not achieve as much cohesive relationship and team success. The efforts and contributions made by all team members significantly enhanced team performance. The study also uncovered empirical evidence that student leaders' prior sport experience and teamwork spirit were essential for them to be transformational leaders in the SE-based PE unit.

To address the second research purpose, positive social interaction and whole team mentality were the most frequently cited factors (other than student leadership) that facilitated the development of team cohesion. The SE model provides ample social interaction opportunities for students to collaborate with each other toward common goals. Kao (2019) found that

compared to the teacher-led, traditional PE, the SE model offered meaningful social interdependence to improve teamwork and interpersonal interaction. Previous research showed that students enjoyed the group affiliation provided through the persisting team memberships (Kinchin et al., 2009). Wallhead et al. (2013) found that students who experienced two semesters of SE had higher than average scores on social affiliation goals, suggesting the effect of the SE model on nurturing positive social relationship. The findings of this study also provided empirical evidence that the essential features of SE, particularly team affiliation and festivity facilitated the development of team cohesion. This finding is consistent with previous observations that becoming an affiliated member of a persisting team improved student's sense of belonging and feelings of identity (MacPhail et al., 2004). After all, peer acceptance and group inclusion are major driving forces for adolescents' everyday lives (Cotterell, 1996).

Winning and the determination to win was another factor that facilitated the development of team cohesion. The study found that some teams did not have strong desires to win or failed to carve out the appropriate relationship between competition and cooperation. Previous research found that a competitive context positively affected how individuals handled a task and influenced their desires to perform better (Sansone & Harackiewicz, 1996). Although competition might contribute to negative behaviors and outcomes (Deci & Ryan, 1985; Kohn, 1992), the combination of competition and cooperation generally has positive impacts on intrinsic motivation and team performance (Tauer & Harackiewicz, 2004). In this study, several teams prioritized cooperation and friendship over competition. Placing competition on the opposite side of cooperation undermined students' desire to compete and hampered team cohesion development. To improve team cohesion, the PE teacher should strive to assist students in striking a balance between competition and cooperation.

The most cited barrier was the lack of opportunity to play. Student leaders' leadership skills has been identified as problematic for the equitable participation (Hastie, 2011). Previous research also found that students who were more athletic usually had higher social status and dominated game play and important decision making process in team sports. Brock et al. (2009) found that students' status, which significantly influenced playing time during the SE unit, was determined by four characteristics: athletic involvement, economic level, attractiveness, and personality. This study showed that the less skilled students (students with low status) often experienced self-inflicted pressure due to their lack of competence and confidence. Further research is warranted to investigate the micro cultures within each team to make sure every student has the autonomy and voice in the decision-making process and has equal opportunities to grow and learn. After all, one essential aspect of the SE model is to create equitable and inclusive learning experiences for all students in school-based PE experiences (Siedentop, 1994).

The qualitative data further revealed that students' maturity played a significant role in team cohesion development. Students in higher grade levels were deemed more mature as they had been exposed to more youth sports or PE experiences than their younger counterparts. They had a better understanding of the teamwork mechanism and knew how to communicate effectively with other team members. The findings of this study highlight the importance of teaching teamwork mentality and instilling teamwork spirits to younger students throughout the SE unit, especially when they are first exposed to the SE model.

This dissertation is one of the very few studies that have investigated the development of team cohesion in the K-12 PE context. It is the first study to study team cohesion development within a SE-based K-12 PE context. The novel findings have addressed the existing research

gaps by studying these important topics in adolescent girls and by utilizing comprehensive mixed methods to understand team cohesion development.

Despite the potential contributions of this study to the field, I acknowledge three limitations. First, the small sample size (all girls), recruited from one single convenience private school, limited the statistical powers of my inferential analyses as well as the generalizability of the research findings to broader populations from diverse schools. The small sample involved in the study was caused by the COVID-19 related restrictions and limited resources. Future research with greater amount of resources beyond the pandemic would generate more robust, generalizable findings. Second, the study was conducted at the time when the students just finished a tag football SE season. Although teacher rearranged the team formation for the team handball season, this limited, varying growth of team cohesion across the three time points might have been more or less influenced by the lingering effect of the students' prior experiences at the preceding season. Likewise, most of the students in seventh and eighth grade had previously socialized together over a long period both within and beyond the school, which might have further limited the growth of cohesion development, as observed in this study. Future research may examine student teams' cohesion development in schools where students just got placed into new classes (and team) and had no to little prior experiences with the SE model. Third, the SE unit in this study, despite it being 17-lesson long, only lasted for a month. The team cohesion changing trajectory would be different for schools that have less frequent PE instruction and a longer SE season (e.g. two PE classes each week for three month). Future studies are warranted to investigate the changing patterns of team cohesion within a SE season.

The findings of this study have several practical implications to the curriculum and instruction in PE. First, student leaders' leadership skills demand teacher's particular

consideration when designing a SE curriculum or during the delivery of the sport content. The SE model provides rich experiences for students to develop their leadership skills and embrace challenges in small-sided heterogeneous group. Presenting task cards to student leaders and instructing them on how to include marginalized students may considerably improve their leadership skill and facilitate the development of team cohesion. Second, PE teachers need to instill and permeate the teamwork mentality to their students, especially to those who lack of prior sport experience and prior exposures to the SE model, to help them strike a balance between competition and cooperation. Third, a PE teacher's instructional practice should emphasize creating a motivational learning environment to help students overcome barriers in their everyday lives and teach them how to resolve conflicts with other students, which is critical to the development of team cohesion and team performance.

Conclusion

Providing inclusive, equitable, and meaningful SE-based PE curriculum and instruction may foster students' team cohesion development. Understanding students' changing trajectory of team cohesion development and identifying facilitators and barriers related to cohesion development in a SE unit are topics of novelty in PE pedagogy. The dissertation study revealed limited and varying changes of team cohesion throughout the team handball SE season, but the changes appeared to be moderated by student leadership, especially for task cohesion. The study also unraveled multiple factors that facilitated or hampered the development of team cohesion. Future research and practice may emphasize these facilitators and overcome the barriers, to improve all students' socialization processes and outcomes, build cohesive teams, and ultimately have positive and successful PE experiences and outcomes.

Appendix A. The Observation Protocol

Today's Date _____ **Today's Day:** _____

Lesson Time: _____ **Week # of the Season:** _____

Class grade: _____

1. Draw diagrams of the gym setting (space and equipment layout, location of teacher and students, etc.) by time segments (early, mid, late phase of the lesson)

2. Describe the teacher's instructions chronologically.

3. Describe the teacher's behaviors related to facilitation of team cohesion (e.g., interact with team leaders, help resolve conflict, providing assistance, etc.).

4. Describe student teams' behaviors and actions in general.

5. Describe student teams' behaviors and actions related to team cohesion.

6. Describe student leaders' behaviors (leadership, instructions, role modeling, encouragement, support, etc.)

7. Describe my reflective thoughts:

Appendix B. Youth Sport Environment Questionnaire

Name: _____ Gender: _____ Team: _____
 Class: _____ Date: _____

The following questions ask about your feeling toward your team. Please CIRCLE a number from 1 to 9 to show how much you agree with each statement.

1. We all share the same commitment our team's goals.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

2. I invite my teammates to do things with me.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

3. As a team, we are all on the same page.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

4. Some of my best friends are on this team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

5. I like the way we work together as a team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

6. I do not get along with the members of my team.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

7. We hang out with one another whenever possible.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

8. As a team, we are united.

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

9. I contact my teammates often (phone, text message, internet).
1 2 3 4 5 6 7 8 9
Strongly Strongly
Disagree Agree
10. This team gives me enough opportunities to improve my own performance.
1 2 3 4 5 6 7 8 9
Strongly Strongly
Disagree Agree
11. I spend time with my teammates.
1 2 3 4 5 6 7 8 9
Strongly Strongly
Disagree Agree
12. Our team does not work well together.
1 2 3 4 5 6 7 8 9
Strongly Strongly
Disagree Agree
13. I am going to keep in contact with my teammates outside of PE.
1 2 3 4 5 6 7 8 9
Strongly Strongly
Disagree Agree
14. I am happy with my team's level of desire to contribute and win.
1 2 3 4 5 6 7 8 9
Strongly Strongly
Disagree Agree
15. We stick together outside of practice in PE.
1 2 3 4 5 6 7 8 9
Strongly Strongly
Disagree Agree
16. My approach to playing is the same as my teammates.
1 2 3 4 5 6 7 8 9
Strongly Strongly
Disagree Agree
17. We contact each other often (phone, text message, internet).
1 2 3 4 5 6 7 8 9
Strongly Strongly
Disagree Agree
18. We like the way we work together as a team.

9

Strongly Agree

Task		Social	
Item#	Score	Item#	Score
1		2	
3		4	
5		7	
8		9	
10		11	
14		13	
16		15	
18		17	
Sum		Sum	
Mean		Mean	

Each factor is summed and then an average taken for individuals.

Appendix C. IRB Approval Letter



TO: Chen, Senlin
LSUAM | Col of HSE | Kinesiology

FROM: Alex Cohen
Chairman, Institutional Review Board

DATE: 04-Aug-2021

RE: IRBAM-21-0613

TITLE: A MIXED METHODS RESEARCH
INVESTIGATION OF TEAM
COHESION WITHIN A SPORT
EDUCATION SEASON

SUBMISSION TYPE: Initial Application

Review Type: Exempt

Risk Factor: Minimal

Review Date: 03-Aug-2021

Status: Approved

Approval Date: 03-Aug-2021

Approval Expiration Date: 02-Aug-2024

Exempt Category: 2b

Requesting Waiver of Informed Consent: No

Re-review frequency: Three Years

Number of subjects approved: 200

LSU Proposal Number:

By: Alex Cohen, Chairman

Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.

5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.**

**All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at <http://www.lsu.edu/research>*

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Vita

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