

Summer 8-17-2017

Alternative Teaching Approaches to Promote Student Motivation in Physical Education at the Secondary Level

Brittany Brace
bbrac1@u.brockport.edu

Follow this and additional works at: http://digitalcommons.brockport.edu/pes_synthesis

 Part of the [Health and Physical Education Commons](#), [Kinesiology Commons](#), and the [Sports Sciences Commons](#)

Recommended Citation

Brace, Brittany, "Alternative Teaching Approaches to Promote Student Motivation in Physical Education at the Secondary Level" (2017). *Kinesiology, Sport Studies, and Physical Education Synthesis Projects*. 25.
http://digitalcommons.brockport.edu/pes_synthesis/25

This Synthesis is brought to you for free and open access by the Kinesiology, Sport Studies and Physical Education at Digital Commons @Brockport. It has been accepted for inclusion in Kinesiology, Sport Studies, and Physical Education Synthesis Projects by an authorized administrator of Digital Commons @Brockport. For more information, please contact kmyers@brockport.edu.

Alternative Teaching Approaches to Promote Student Motivation in Physical Education at
the Secondary Level

A Synthesis Project

Presented to the

Department of Kinesiology, Sport Studies, and Physical Education

The College at Brockport

State University of New York

In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Education

(Physical Education)

by

Brittany A. Brace

July 29th 2017

THE COLLEGE AT BROCKPORT
STATE UNIVERSITY OF NEW YORK
BROCKPORT, NEW YORK

Department of Kinesiology, Sport Studies, and Physical Education

Title of Synthesis Project: Alternative Teaching Approaches to Promote
Student Motivation in Physical Education at the Secondary Level

Read and Approved by: Melanie Perreault
Melanie Perreault, Ph.D.

Date: August 8, 2017

Accepted by the Department of Kinesiology, Sport Studies, and Physical Education, The College at Brockport, State University of New York, in partial fulfillment of the requirements for the degree Master of Science in Education (Physical Education).

8/17/17
Date:

Cathy Houston-Wilson

Dr. Cathy Houston-Wilson
Chairperson, Department of
Kinesiology, Sport Studies, and Physical
Education

Abstract

The purpose of this synthesis was to examine the existing body of literature on alternative teaching approaches in physical education and their relationship to student motivation at the high school level. The self-determination theory was used throughout the critical mass of articles as a guide to measure student motivation levels. Themes were organized by varying teaching approaches used within each study. Prevalent research focused on the sport education model (SEM) as a major alternative teaching model that was useful when measuring student motivation. To provide concrete findings, more research needs to be conducted in regards to other alternative teaching styles in connection to student motivation in physical education. Specifically, future research should examine alternative teaching approaches that are “less-direct” to see if there is a correlation between student involvement and student motivation to participate.

Keywords: [increased student motivation, autonomy, amotivation, student participation, teaching styles or methods, pedagogy or teaching or learning, self-determination theory, sport education model, teaching games for understanding, and constraints-led approach]

Table of Contents

Chapter 1- Introduction.....	7
Motivational Framework.....	8
Rationale.....	9
Scope of Synthesis.....	10
Operational Definitions.....	11
Chapter 2- Methods.....	12
Data Collection.....	12
Inclusion Criteria.....	13
Data Analysis.....	14
Chapter 3- Results.....	14
Sport Education Model.....	14
Cooperative Learning.....	20
Constraints-Led Approach.....	22
Alternative Teaching Approaches.....	23
Summary.....	25
Chapter 4- Discussion.....	26
Team Camaraderie.....	26
Teaching Climate.....	28
Limitations.....	30
Future Research.....	33
Conclusion.....	34

References.....35

Appendix A- Synthesis Article Grid.....37

Appendix B- Mosston and Ashworth’s Teaching Styles.....42

Figures

Figure 1- The Self-Determination Continuum as presented by Ryan and Deci
(2000).....9

Chapter 1

Introduction

The level of student participation in physical education is an issue that has continued to be of topic. Some studies associate intrinsic motivation with enhanced concentration, effort, and continued participation in physical activity (Moy, Renshaw & Davids, 2016). As research has found, student motivation in physical education declines as students progress through school (Mowling et al., 2004; Spittle & Byrne, 2009). Current research conveys that the issue of lack of student motivation and participation in physical education is primarily at the pre-teen and teenage level. Therefore as students continue throughout school, specifically after entering high school, the level of motivation students possess in physical education drops.

Research has been conducted to find reasons as to why secondary level students lack motivation to participate in physical education. Social factors, lack of skill in activity, lack of importance in physical education class, and teaching style are all reasons students lack motivation to participate in physical education (Perlman 2012a; Perlman & Karp, 2010). As a result, students are not benefiting from the opportunities they have in physical education class to stay active and healthy. Although research has found such reasons, there still are unanswered questions as to how physical education teachers can help increase student motivation and participation of secondary level students in physical education. Therefore, physical education teachers need to find ways to get secondary students to become more motivated and interested in physical

education. If successful, positive benefits may occur (e.g., increased social interactions, skill competence, health and fitness benefits).

Motivational Framework

One way we can understand student motivation is through the use of the self-determination theory. The self-determination theory views motivation on a continuum that ranges from complete absence of motivation (i.e., amotivation) to activities that are personally valued and internalized (i.e., intrinsic motivation) (Moy et al., 2016) (see Figure 1). While many students at the secondary level lack motivation to participate in physical education, the self-determination model can be used as a way to understand where on the continuum a student falls. It is believed that the level of competence, relatedness, and autonomy are psychological needs that determine an individual's level of social development and personal well-being (Ryan & Deci, 2000). *Competence* is the feeling of success or mastery within an activity while *relatedness* is when an individual feels a sense of belonging or connection while receiving support from others. Furthermore, *autonomy* is when individuals are provided with the freedom of choice or control over their own behavior (Moy et al., 2016). Therefore, when one's psychological needs are met, an individual will possess more characteristics near the intrinsic motivation end of the spectrum. By viewing the different components of the model, physical education teachers should be able to see what qualities a student is lacking. Moreover, physical education teachers should target the amotivated audience in order to find ways to connect to students and possibly increase their perceptions of physical education. By using the self-determination theory, results from the critical mass can be

reviewed and discussed to see common reasons as to why students lack motivation to participate in physical education.

The Self-Determination Continuum Showing Types of Motivation With Their Regulatory Styles, Loci of Causality, and Corresponding Processes

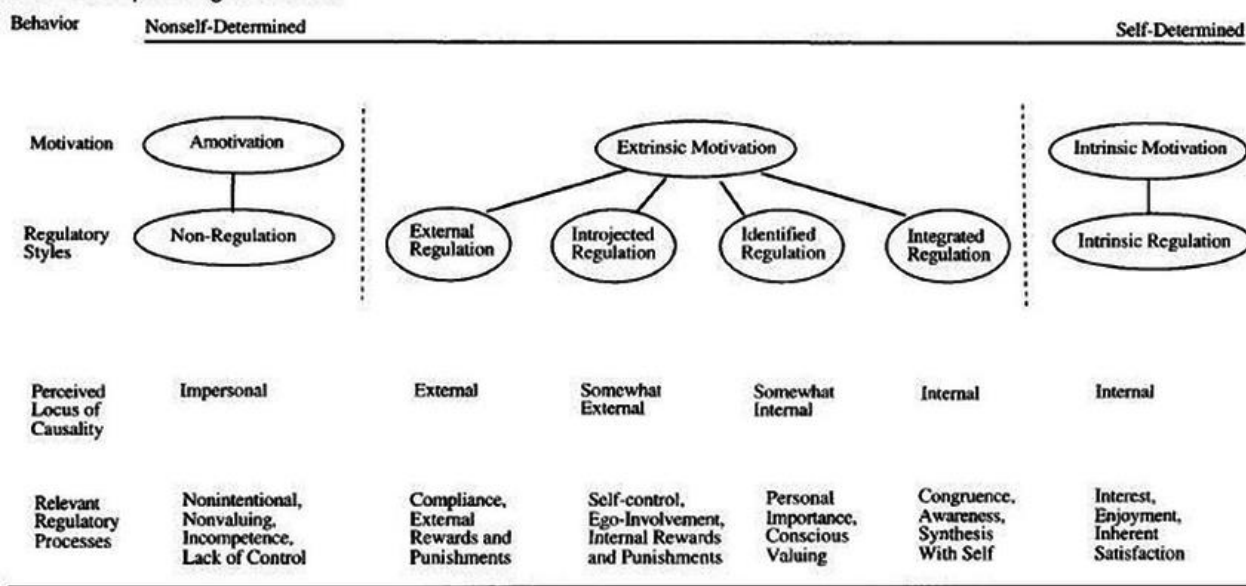


Figure 1. The Self-Determination Continuum of Motivation as presented by Ryan & Deci (2000).

Rationale

The most prevalent physical education teaching approach worldwide is the traditional teaching approach (Moy et al., 2016). To explain, a traditional teaching approach involves direct instruction from physical education teachers that focuses on a more “teacher-centered” or teacher-led physical education curriculum. By using the traditional teaching approach as a common teaching style, students are directed on what tasks to perform rather than having control or choice in the matter. Hence, it is possible that the traditional teaching approach is connected to the decreased level of student motivation in physical education. In other words, if students are given more

choices and options with different tasks that are more stimulating, their level of interest and motivation to participate is likely to increase.

Student-centered teaching approaches focus on allowing students to have more control of their physical education experience. In contrast to traditional teaching styles, many alternative teaching approaches are student-centered. By allowing students to make their own choices, solve problems, and work together with their peers, students become more responsible and accountable for their participation in physical education. By providing students with an environment that promotes student input, levels of motivation, interest, enjoyment, and effort are likely to increase. When these variables increase, students are closer to the self-determined and intrinsically motivated end of the continuum. As a result, the purpose of this synthesis is to see what information is known about alternative teaching styles for physical education teachers to use to help increase student motivation to participate in physical education.

Scope of Synthesis

Research for this synthesis will involve exploring studies that focus on using alternative teaching approaches to increase student motivation in physical education. Within the different articles, there will be established instructional models such as the sport education model (SEM) along with specific teaching styles. Other studies will focus on general strategies targeting an autonomy supportive physical education climate. The majority of these studies will focus on participants at the high school level, while a few will take place at the college level.

Operational Definitions

Competence. The feeling of success or mastery within an activity (Moy et al., 2016).

Relatedness. When individuals feel a sense of belonging or connection, with support from other individuals (Moy et al., 2016).

Autonomy. When individuals are provided with the freedom of choice or control over their behavior (Moy et al., 2016).

Amotivation. Refers to when an individual does not act at all, or acts without intent, as just going through the motions. Amotivation results from not valuing an activity, not feeling competent to do it, or not expecting a desired outcome from doing such activity (Ryan & Deci, 2000).

Extrinsic motivation. Refers to actions that are performed for some set of external factors, such as obtaining a reward or influenced by a feeling or guilt (Deci & Ryan, 2000; Perlman, 2012a).

Intrinsic motivation. A level by which an individual will engage in behaviors or actions for the internal pleasure that they provide them with (Deci & Ryan, 2000; Perlman, 2012a). For instance, feeling a sense of accomplishment, challenge, and enjoyment are internal feelings that cause an individual to want to perform a specific behavior or action.

Chapter 2

Methods

Data Collection

A compilation of online databases were used to collect studies that focused on the synthesis topic of student motivation in physical education. SPORTDiscus and Academic Search Complete were the main online databases used to collect articles of interest. Google Scholar was also used periodically to search for more suitable articles.

When searching for articles that focused on student motivation in physical education, the initial search found approximately 1,094 articles. In conducting the initial search, the online database SPORTDiscus was used with the key words, “student motivation” and “physical education”. Therefore, other key words were added to additional searches in order to filter out articles of little relevance. Other key words that were used in searches included, “increased student motivation”, “autonomy”, “amotivation”, “student participation”, “teaching styles or methods,” “pedagogy or teaching or learning”, “self-determination theory”, “sport education model”, “teaching games for understanding”, and “constraints-led approach”.

The ancestry or footnote chasing method was also used where key words or titles were searched after looking at the reference section of previously collected articles. Key words, in this case, authors, were then searched. This search consisted of “Perlman”, “Mosston”, “Ntoumanis”, “Deci”, and “Ryan”.

Inclusion Criteria

When searching for suitable articles to include in the critical mass, different avenues of deciphering were used. At first each search focused primarily on the discussion of increasing motivation in physical education within the article. As a result, some articles discussed studies that focused on increasing physical activity in sports teams or intramurals, or perspectives from the physical education teachers. Although the information collected was current and credible, it was not specific enough to the synthesized topic.

As the search continued, more specific points were needed in the articles to be used for the synthesis. For instance, articles that discussed a specific teaching model or strategy used to increase student motivation were chosen. Specifically, articles that discussed the use of alternative teaching models and strategies, rather than the traditional style of teaching were selected. In addition, articles that used the self-determination theory to measure student motivation were applicable. Other theories to measure motivation or effort, such as the constraints-led approach were also added to the critical mass. As a result, the main focus was to search for different teaching models or theories that were non-traditional and measured student motivation in the physical education setting. From the articles selected, most of the participants were high school aged students. However, there were a few articles that used elementary aged participants and therefore were eliminated from the critical mass to present more sound findings.

Data Analysis

An article grid was created in order to extract important information from each source. Using the article grid, information from studies was placed in different categories based off the teaching model or approach used, as well as the overall findings. Themes created depict the findings collected from the articles within the critical mass.

Chapter 3

Results

The following section will provide known information regarding alternative teaching models (i.e., non-traditional) and strategies that affect student motivation and participation in physical education. During the collection process, approximately 30 articles were reviewed that were relevant to the topic of teaching strategies to promote student motivation in physical education. From the 30 articles reviewed, 11 articles are included in this section that focus specifically on different teaching styles or strategies used to promote student motivation in physical education. The results are organized as follows: Sport Education Model, Cooperative Learning, Constraints-Led Approach, and Alternative Teaching Approaches.

Sport Education Model

Daryl Siedentop developed the SEM in order to provide students with a sport-based educational experience that consisted of understanding and applying knowledge to game play skills (Perlman, 2012b). However, it was not until more recently that the SEM became a popular teaching model used in physical education (Perlman & Karp,

2010). By using the SEM there is a de-emphasis on winning, and an emphasis on other aspects such as teamwork, communication, cooperation, and student accountability.

The SEM is a non-traditional style of teaching that allows students to have more choice or control, collaborate with teammates, and focus on fairplay tactics. Because the SEM does not focus on winning, students that are amotivated in physical education class are more likely to try this alternative approach. The SEM is organized so that all students are important and held accountable for their responsibilities, which is an aspect that varies greatly compared to direct instruction (i.e., traditional teaching). Within the studies provided below, the SEM is compared to traditional styles of teaching to see if there are significant findings.

Wallhead and Ntoumanis (2004) conducted a study that focused on using the SEM against traditional teaching approaches. Participants within the study consisted of 13 and 14 year old students. The study consisted of pre and post test questionnaires, such as the Intrinsic Motivation Inventory (IMI) and the Learning and Performance Orientations in Physical Education Class Questionnaire (LAPOPECQ) that measured enjoyment, effort, and perceived competence. Results revealed that participants involved in the SEM had increased levels of enjoyment, effort, and competence compared to participants that were involved in a traditional teaching approach.

Likewise, Spittle and Byrne (2009) organized a study that also used the SEM verses a direct style of teaching. The participants were 13 and 14 years of age. The IMI and LAPOPECQ were the main questionnaires used for the study. Interest/enjoyment and effort/importance were variables that had significant findings. Similar to Wallhead and Ntounmanis (2004), results indicated that students that were participants in the

SEM showed increased levels of interest/enjoyment and effort/importance from pre to post test scores, compared to those involved in the traditional teaching approach provided.

Wallhead, Garn, and Vidoni (2014) conducted a similar study using a multi-activity program in comparison to the SEM. The multi-activity program consisted of short units that exposed students to sport-based activities. Specifically, when involved in the multi-activity program students were provided little feedback, limited gameplay, and not held accountable for game performance. In other words, the multi-activity program is similar to how sport-based content is traditionally taught at the high school level and therefore may not have as much of an impact on student motivation than alternative teaching styles.

The effects of the SEM on students' motivation in physical education and leisure time activity was measured in comparison to the multi-activity program (Wallhead et al., 2014). The study was conducted for two semesters, within the school year, where block scheduling was used. Therefore, students received physical education two to three times a week for 90 minutes classes. The study measured levels of student enjoyment, effort, autonomy, competence, and relatedness. In regards to students' perceived effort and enjoyment, an IMI was used. Results concluded that students engaged in the SEM showed increased levels of enjoyment from pre to post test. Students' levels of effort slightly decreased from pre to post test scores when involved in the SEM. However, in comparison to students involved in the multi-activity program their levels of effort were still significantly higher. Even more so, the multi-activity program pre test scores for effort were the highest score and ultimately decreased the

most. Although studies found slightly different results in relationship to effort, it can still be concluded that the overall levels of enjoyment, interest, effort, and importance are higher when submerged in the SEM verses more traditional styles of teaching. Increased perceptions towards physical education when involved in the SEM can be associated with increased motivational levels.

The skill-drill-game (SDG) approach was another teaching style that was compared to the SEM (Perlman, 2012b). The SDG approach consists of skill/tactical development, game drill and inter-team game play, and postseason. Therefore, the difference between the SDG and the SEM is that SDG is teacher led. Also, the SDG uses inconsistent teams where there is a stronger focus on winning and skill, rather than accountability and fairplay.

In the study (Perlman, 2012b), 9th and 10th grade students were randomly assigned to be a participant in the SEM or the SDG model. While undergoing a 4-week unit, students were to complete a weekly Learning Climate Questionnaire (LCQ) and a Sport Motivation Scale (SMS). Results indicated that students that were involved in the SEM rated higher levels of motivation and perceived autonomy support. Even more so, pre-service teachers that taught using the SEM also felt that their interactions with students were more autonomy-supportive. Therefore, the psychological need of autonomy was higher in students that were involved in the SEM, which matches with the higher levels of motivation recorded.

Similar to Perlman's (2012b) 4-week study, a more recent experiment consisted of using a hybrid combination of the Teaching Games for Understanding (TGfU) model and SEM (Gil-Arias, Harvey, Carceles, Praxedes & Del Villar, 2017). Participants within

the study were 15 and 16 years old. The study consisted of two interventions. Each intervention consisted of a “hybrid” and a “traditional” group. The hybrid group consisted of a volleyball unit using aspects of both the TGfU and SEM while the traditional group consisted of an ultimate frisbee unit taught with direct instruction. Similar to the SEM, the TGfU allows students to have a “voice” and consider different tactical and strategic approaches to complete a task within a particular sport.

When examining data from both sessions, results indicated that participants showed higher levels of autonomous motivation, autonomy, competence, relatedness, enjoyment, and intention to be physically active when participating in the TGfU/SEM intervention (Gil-Arias et al., 2017). Thus, the level of intrinsic motivation of students involved in the TGfU/SEM was likely higher, since the three basic psychological needs were at a higher level than prior.

In contrast to previous articles depicted, the use of qualitative data was found to be insightful when measuring students’ perceptions of the SEM and motivational levels overall. For example, Perlman (2012a) examined the perceptions and beliefs of amotivated secondary physical education students during the use of the SEM. The SEM was tested in a 9th grade physical education class for an entire semester. As a result, four different SEM units, consisting of approximately 14 lessons each, were implemented throughout the semester. The units consisted of basketball, volleyball, flag football, and ultimate frisbee. Interviews and field notes were collected during the first few weeks (weeks 1-5) of the SEM. At that time, many of the amotivated students did not see the importance of physical education as a whole. For instance, students made references to physical education as “stupid”, “the dumbest class”, and “worthless”.

Furthermore, during student interviews, students discussed that they felt they did not do anything that was of “importance” in physical education. Additionally, students that were considered amotivated tried to put effort in during previous classes but became frustrated when they were not successful. For instance, a student explained that no matter how hard he would try he would never be able to “catch up” or “belong”. Thus, issues such as lack of interest, importance, and skill were variables that caused one to be near the amotivation level on the self-determination theory continuum.

Perlman (2012a) also interviewed amotivated students later in the “season” to examine any changes in their opinion on physical education and the SEM as a whole. Students talked about working on a team with “nice” people, said they felt less worried about making a mistake, and found physical education class to be more “fun”. Therefore, it is noted that when a team was doing well, the amotivated students began to demonstrate behaviors of enjoyment (Perlman, 2012a). As a result, using the SEM was able to alter some of the amotivated students’ perceptions of physical education. However, a variety of teaching styles, other than the SEM, may also benefit amotivated secondary level students.

Similarly, Perlman & Karp (2010) had topics of disinterest as common points of discussion when conducting interviews and taking field notes during the beginning weeks of a SEM introduction. The SEM was placed in the physical education setting for a total of seven weeks. Within the seven weeks, two different 3-week SEM units were implemented: football and soccer. When asked what students thought of the fairplay and sportsmanship aspect of the SEM, one student responded, “It is stupid. I lost my fairplay point because I yelled out...that happens in regular sports” (p.411). When asked

if fairplay has any value in class he stated, “No, but I follow it now because the teacher is making us” (p. 411). However, other students disagreed completely and were in favor of the fairplay aspect of the SEM, among many other aspects. One student explained, “I guess it is like we are having more fun and everyone is active, not like when only the best people would score all the goals and think they’re the greatest at every sport” (p.411). As a result, there were mixed feelings about the implementation of a new teaching model that provided students with more choice and control, but also made them more accountable and responsible for their “part”.

Cooperative Learning

Cooperative learning is a style of learning that involves components of competition and cooperation as students learn with, by, and for each other. Specifically, five elements are highlighted as principles that define a learning structure to be considered cooperative. These five elements include: a) positive interdependence: students succeed in a task only if the other group mates succeed too, (b) promotive face-to-face interaction: students work in direct contact to each other during the task, (c) individual accountability: students must contribute to the group’s goal, (d) group processing: students reflect and discuss during and after each task, and (e) interpersonal and small-group skills: students learn to listen to each other, to share ideas, to give and receive feedback, to take turns, to encourage others (Fernandez-Rio, Sanz, Fernandez-Cando, & Santos, 2017). Consequently, using cooperative learning is an alternative teaching approach that focuses on students interacting in a positive-supportive manner and motivating one another to be as successful as possible.

Fernandez-Rio and colleagues (2017) conducted a study that focused on the use of cooperative learning versus a traditional teaching style to see the impact of a sustained cooperative learning intervention on student motivation. The study consisted of 249 students and four teachers enrolled in four different urban high schools in Spain. The participants within the cooperative learning group received the cooperative learning style of pedagogy for three learning units, while the participants in the traditional teaching group experienced three similar units through a traditional teaching style. Variables measured consisted of intrinsic motivation, identified regulation, introjected regulation, external regulation, amotivation, and cooperative learning.

Results from the study (Fernandez-Rio et al., 2017), consisted of both qualitative and quantitative findings. Students involved in the cooperative learning structure had to relate to their teammates and work with them to perform the designed tasks. One student stated, "My relationship with my two classmates has improved because we were in the same group and I have helped them ..." (p.99). Another student explained that he was placed in a group with teammates he did not know prior to the activity and enjoyed working with new individuals. Students in the cooperative learning group showed increased levels of intrinsic motivation, identified regulation, introjected regulation, and cooperative learning while students in the control group had the inverse effect. Interestingly, both groups had decreased levels of external regulation while only the cooperative learning group had increased levels of amotivation. As a result, numerical findings may not be as reliable. Students in the cooperative learning group showed high levels of intrinsic motivation but also increased levels of amotivation,

which in relation to the self-determination theory is contradictory. Nonetheless, it is still important to take note that intrinsic motivation, identified regulation, and introjected regulation increased in the cooperative learning group while decreasing in the traditional teaching group.

Constraints-Led Approach

The constraints-led approach is a nonlinear pedagogical approach that allows students to explore multiple solutions to a specific task. The constraints-led approach is organized in a manner that elicits movement patterns that are based off of key ideas and concepts of the ecological dynamics and dynamic systems theory. Therefore, the constraints-led approach facilitates the skill learning needs of students in a physical education setting (Moy et al., 2016).

Moy and colleagues (2016) used the constraints-led approach verses a traditional teaching approach to see which participants resulted in higher intrinsic motivation. Competence, relatedness, autonomy, enjoyment, and effort were dependent variables measured when teaching a hurdle lesson. From the quantitative data collected, significant increases in students' levels of relatedness, competence, autonomy, effort, and enjoyment were found after participants experienced a hurdle lesson taught using the constraints-led approach. Participants involved in the traditional teaching group showed decreased levels of relatedness, competence, autonomy, effort, and enjoyment when in comparison to the constraints-led approach group. However, the study consisted of each group receiving both the traditional and constraints-led approach. Specifically, one group received the constraints-led approach first and the traditional teaching approach second, while the other group received each

teaching approach in the reverse order. Still, Moy et al. (2016) stated that results indicated that participants' exhibited behaviors were more self-determined and intrinsically motivated during the constraints-led approach lesson, which corresponds with the numerical findings.

Alternative Teaching Approaches

Additional teaching approaches have also been examined in the literature. These include the following: reciprocal, guided discovery, self-check, inclusion, divergent, and convergent teaching styles. To further explain each style, *reciprocal* teaching involves students being placed in small groups where one student is the evaluator while the other students are the performers. Set criteria is given by the teacher that students follow to the best of their ability as they are evaluated by their peers. Then roles are reversed. *Guided discovery* involves the physical education teacher asking questions to lead students into a specific area of discovery, where multiple responses can be correct. Guided discovery allows for students to use their creativity to respond to questions. The *self-check* teaching style consists of students reviewing their skill ability when compared to set criteria that is established by the physical education teacher prior. The *inclusion* style involves a differentiated approach where multiple levels of student performance exist in the same task allowing students to determine their own level within the activity. Lastly, *divergent* teaching requires teachers to design a problem that elicits a series of alternative solutions while *convergent* teaching is the opposite; only one solution is correct (See Appendix B).

Morgan, Kingston, and Sproule (2005) used both the reciprocal and guided discovery styles of alternative teaching in comparison to a more traditional teaching

style. Participants consisted of students between the ages of 12 and 13 years old. The instructors consisted of four student teachers. The activities taught entailed middle distance running (command/practice style), sprinting (reciprocal style), and shot put (guided discovery style). Participants were measured on positives and negatives of each teaching style along with task structure, authority and recognition/evaluation structures. By using the reciprocal style of teaching, 13% of participants discussed the element of “fun”. When emerged in the guided discovery method, students raved that the teaching style “progressed well” and that trying different techniques was “enjoyable”. In relation to negative aspects of using alternative teaching styles within this study, boredom was the most prevalent response in each of the three teaching models. However, when using the command/practice style of teaching, which is analogous to direct or traditional teaching in physical education, 30% of students reported boredom during the warm-up activity. During the main part of the lesson, 23% of students reported boredom discussing that the lesson was very repetitive. The reciprocal and guided discovery teaching styles had significantly lower percentages of boredom: 17% and 13%, respectively. Along with different aspects related to “fun” and “interest” when using different alternative teaching styles, the length that a new program or intervention was implemented into a physical education class may also alter students’ interests and motivational levels.

Likewise, Chatzipanteli, Digelidis, and Papaioannou (2015) used alternative teaching styles when conducting a study that consisted of 7th grade students. The experimental group consisted of numerous alternative teaching styles (e.g. reciprocal, guided discovery, self-check, inclusion, divergent, and convergent) throughout the 16-

week intervention while the comparison group (i.e., traditional teaching group) received traditional teaching approaches with no intervention. Each lesson within a unit consisted of two to three different alternative teaching methods within the alternative teaching group. No consistent testing pattern of the alternative teaching styles was used. Still, both groups were taught units of basketball, volleyball, soccer, track and field, fitness enhancement, and gymnastics. Both groups were given two questionnaires, one to complete at the beginning of the 16-week period and one at the end. Results indicated that students in the alternative teaching group had increased levels of intrinsic motivation and lesson satisfaction, while their levels of amotivation decreased. The reverse results were found in the traditional teaching group.

Summary

Information provided from the critical mass of articles offers strong evidence that alternative teaching styles are beneficial in increasing levels of student motivation in physical education. Ultimately the end goal is for students at the secondary level to be self-motivated and interested in participating in physical education. Students' perceptions and feelings toward physical education is something that can drastically affect one's intrinsic motivation levels. As a result, using alternative teaching styles such as the SEM, cooperative learning, constraints-led approach, and others included from the critical mass, are alternative solutions that can be implemented into a high school physical education curriculum in hopes of increasing student motivation and participation.

Chapter 4

Discussion

The results collected provide an understanding of how using alternative teaching styles can increase student motivation at the secondary level. The goal as physical education teachers is to promote student participation and motivation by finding tactics that can be beneficial in enticing students to participate for their own personal interest and benefit.

Providing students with alternative teaching styles that focus on teamwork, role responsibility, accountability, cooperation, communication, and fairplay create a positive sense of team camaraderie. Thus, an increase in student motivation to participate is more likely when involved in a team. Additionally, student perception of teaching climate is another factor that can affect students' level of interest and motivation to participate. By providing students with a physical education curriculum that promotes skill effort and personal improvement, students that are less motivated may be more motivated with the sense of less pressure.

Team Camaraderie

Relatedness is one of the three basic psychological needs that must be met in order to achieve higher levels of intrinsic motivation (Ryan & Deci, 2000). As Moy et al. (2016) explains, relatedness is when an individual feels a sense of belonging or connection while receiving support from others. Empirical evidence suggests that using alternative teaching styles can increase levels of relatedness in physical education classes.

According to Fernandez-Rio et al. (2017) students involved in the cooperative learning structure had to relate to their teammates and work with them to perform designed tasks. Participants discussed how they had to work with classmates to reach a common goal while establishing new connections and bonds. Before the implementation of the cooperative learning approach, classmates did not know their peers well and had not previously worked together for a common end result.

Perlman and Karp (2010) also found that students felt a sense of belonging and accountability when involved in the SEM. For instance, students explained that they didn't expect to get to know people in gym class and were pleasantly surprised when they were able to. Furthermore, some students explained they had stereotypes about one another and were hesitant to work together at first. However, after working together new friendships were formed. Thus, utilizing consistent teams helped to structure the environment in a manner that created bonding between classmates (Perlman & Karp, 2010). Likewise, perceptions of ability and affect (i.e., enjoyment and emotional security) improved when students participated in the SEM (Perlman, 2012a).

The SEM is organized in a way that promotes teamwork, affiliation, and cooperation, which was supported by many of the findings. For example, students that struggled to adapt to the SEM "roles" were helped by their teammates. Even more so, students were encouraged, given high fives, and given cheers from their teammates (Perlman, 2012a). Consequently, students that may not have been the most skilled were much more likely to participate and did not worry about "messing up" when they had teammates that supported them. Similar findings were observed in a study that focused on the use of guided discovery, reciprocal, and command/practice styles of teaching

(Morgan et al., 2005). It was founded that the guided discovery and reciprocal style lessons caused participants to prefer “cooperative friendship groups”, which in return was more consistent with a mastery climate.

By using alternative teaching methods that allow students to be responsible and accountable for their part on a team is an aspect of the SEM and other alternative teaching models that trigger student motivation. Thus, creating a curriculum that is less direct and allows students to have a “voice” while working together with their peers, has ultimately played a key role in the success of implementing alternative teaching models.

Teaching Climate

Like relatedness, competence is another basic psychological need that must be met in order to achieve higher levels of intrinsic motivation (Ryan & Deci, 2000). As Moy et al. (2016) explains, competence is the feeling of success or mastery within an activity. However, it is important to understand that there are two different types of climate that one can be involved in during an activity: mastery and performance. A mastery climate is a task-involving environment where skill development, effort, and personal improvement are emphasized. A performance climate is an ego-involving environment where results and outperforming others are promoted (Fernandez-Rio et al., 2016). Research suggests that being emerged in a mastery climate contributes to higher autonomy, competence, relatedness, intrinsic motivation, effort, responsibility, relationship, and enjoyment (Fernandez-Rio, Mendez-Gimenez & Cecchini, 2014) while performance climates have been associated with anxiety and boredom (Braithwaite, Spray, & Warburton, 2011).

Wallhead & Ntoumanis (2004) found that students had increased levels of task climate and task goal orientation when involved in the SEM. Therefore, it can be implied that students' perceptions of the SEM were more positive resulting in enhanced intrinsic motivation. Even more so, studies suggest that students that have higher levels of task orientation use individual improvement and effort to define success (Wallhead & Ntoumanis, 2004), which is what alternative teaching styles focus on. Similarly, students showed decreased levels of ego goal orientation and ego climate. Ego goal orientation and ego climate are two variables that are associated with traditional teaching styles that primarily focus on skill achievement and success, rather than skill improvement. Thus, it should be noted that high levels of skill and success were not occurring in the traditional teaching setting, as one would hope for. Due to decreased levels of both ego climate and ego goal orientation, it is likely that an inverse effect is occurring. As a result, students involved in traditional teaching approaches are showing decreased levels of enjoyment and effort while not improving in their skill acquisition overall. Therefore, findings indicate that participants involved in the SEM benefited more intrinsically by their increased levels of task climate and task goal orientation.

As explained prior, students are more likely to be successful when involved in an activity that promotes task climate (i.e., mastery climate) and task goal orientation. In contrast, students that have high levels of ego orientation tend to avoid learning difficult tasks, which might jeopardize their ability to perform a task (Wallhead & Ntoumanis, 2004). Hence, providing students with a mastery climate environment involves the use of positive reinforcement of effort, improvement, and cooperation (Spittle & Byrne, 2009), which in return increases students' level of competence.

Limitations

While the collective results from the critical mass supports the idea that alternative teaching styles or models increase secondary level students' motivation in physical education, there are a few limitations that should be considered. Among the critical mass, different methods were used. Specifically, studies varied in experience of instructors, type of participants, the process of data collection, and activities within each study.

Experience of instructors. Throughout the critical mass of articles, the majority of studies focused on participants at the high school level, where experienced physical education teachers were the instructors. However, Perlman (2012b) conducted a study that was two-fold. One focus of the study was to examine the influence the SEM had on pre-service teachers' autonomous instruction. The other focus was on students' perceptions of the autonomous instruction given by the pre-service teachers within the study. Therefore, the pre-service physical education teachers were the instructors for the study. Specifically, the pre-service physical education teachers were enrolled in one secondary physical education methods course for sixteen weeks. Within the course, pre-service teachers had to design, develop, and implement a 4-week team sport unit using the SEM or the SDG approach. Hence, it is important to note that the pre-service teachers did not have any prior experience teaching physical education full time, and had little prior experience with SEM. Thus, a novelty effect where participants' perceptions of the autonomous instruction may have been scored highly due to its new introduction into the physical education setting rather than the successfulness of the pre-service teachers' teaching ability.

Participants. Contrary to the use of pre-service teachers as instructors, Moy et al. (2016) utilized pre-service physical education teachers as participants. Therefore, the mean age range for participants within the study was 20 years of age, which falls outside of the secondary level range. Moreover, students in a physical education teaching program might be more interested and motivated to learn verses secondary level students.

The majority of studies included both male and female participants; however, a study by Wallhead and Ntoumanis (2004) may not be as comparable, as participants were only male students. Furthermore, physical education was taught in single-sex groups, which could also alter the findings due to no female students being present during the study. During teenage years, students are concerned about their appearance and what others think of them among many other aspects, especially in mixed gender scenarios. However, due to the fact that no females were present, levels of enjoyment and effort during the study may be altered.

Process of data collection. While a majority of studies focused on comparing the use of a traditional teaching style to an alternative teaching style (i.e., SEM, constraints-led approach, cooperative learning, etc.), the process in which studies were conducted differed. For example, Chatzipanteli et al. (2015) conducted an extensive 16-week study that focused on using different alternative teaching styles such as reciprocal, self-check, and guided discovery to see the influence on student motivation. By conducting a study of such duration it allowed students to get more comfortable with the transition of a new teaching style. However, some studies (e.g., Perlman, 2012b; Gil-Arias et al., 2017)

were only conducted for a few weeks; thus, a lack of adequate time may have affected the participants' ability to adapt well to the new teaching model.

Activities within study. Numerous studies (e.g., Wallhead & Ntoumanis, 2004; Spittle & Byrne, 2009; Perlman, 2012b; Wallhead et al., 2014) used the same sports/activities when teaching the traditional and alternative approach throughout their study. However, Gil-Arias et al. (2017) conducted a study that used two different sports when teaching the TGfU/SEM verses a traditional teaching style. Volleyball was used in the TGfU/SEM intervention while ultimate frisbee was used for the direct style of teaching. Moreover, volleyball and ultimate frisbee are two sports that are drastically different in multiple areas. While both sports are “team sports”, the skill, strategy, and tactics that are involved in each sport are quite diverse. Due to differences in activities, there may be individuals that preferred one sport instead of the other.

Likewise, a study consisted of different activities used within three different teaching approaches (Morgan et al., 2005). Specifically, when measuring student motivational levels and interests in the reciprocal, guided discovery, and command style of teaching, different track themed lessons were taught. Participants involved in the reciprocal teaching method took part in a sprinting lesson while participants involved in the command style of teaching focused on middle distance running. The guided discovery approach lesson focused on shot put. Therefore, although each of the three lessons were track and field related, each activity was very different. While two lessons focused on running, the other lesson focused on using muscular strength. Also, some students may have enjoyed one aspect of track and field more than the others

provided. As a result, there are factors that should be considered that may play a role in swaying the results collected from both of the studies depicted.

Future Research

Although a significant amount of research has been conducted on student motivation in physical education, there is a lack of research in regards to specific non-traditional teaching styles. For instance, there is limited research concerning the motivational effects of reciprocal teaching, guided discovery, divergent, convergent, self-check, and inclusion strategies (Chatzipanteli et al., 2015; Morgan et al., 2005). Therefore, more research needs to be conducted using different alternative teaching styles to close the research gap and aid in developing more concrete findings. In regards to the use of specific teaching models, the SEM has been researched quite extensively. The information gathered from such articles has proven significant, as findings are all congruent. However, the use of the cooperative learning, constraints-led approach, and TGfU are excellent alternative teaching models that promote student choice and control. Due to the fact that there is little research conducted using these models, and their relationship to student motivation at the secondary level, a call for further research to be conducted is necessary.

Although the use of alternative teaching approaches has shown to positively affect student motivation levels, using such approaches is novice to many current experienced physical education teachers. As a result, physical education teachers that are interested in implementing new alternative models into their physical education curriculum should be provided with enough information and knowledge to be able to do so. Thus, curriculum development courses could be created that further explain how

to implement models, such as the SEM, into a physical education setting for the first time. Also, online tips and tools would be very helpful for teachers new to alternative teaching approaches. Thus, advocating for alternative teaching styles would be needed to ease physical education teachers into trying new non-traditional teaching styles.

Conclusion

Physical education teachers should implement alternative teaching models into their secondary physical education curriculum as it has shown to improve students' levels of motivation as well as interest, effort, and enjoyment in physical education. There isn't a remedy to help all secondary level students become motivated to participate in physical education. However, using alternative teaching models provides students with a sense of togetherness and acceptance, while having more control and choice (Perlman, 2012a), which has shown to increase intrinsic motivation (Ryan & Deci, 2000). Although using alternative teaching approaches may be new to physical education teachers, it is imperative to test out these different teaching models. From using different alternative teaching approaches there may be a specific style that is more applicable to students' needs. By providing students with activities that promote autonomy, relatedness, and competence students are much more likely to feel a sense of intrinsic motivation which ultimately can increase their level of participation in physical education.

References

- Braithwaite, R., Spray, C., & Warburton, V. (2011). Motivational climate interventions in physical education: A meta-analysis. *Psychology of Sport and Exercise, 12*, 628-638.
- *Chatzipanteli, A., Digelidis, N., & Papaioannou, A. (2015). Self-regulation, motivation and teaching styles in physical education classes: An intervention study. *Journal of Teaching in Physical Education, 34*, 333-344.
- Fernandez-Rio, J., Mendez-Gimenez, A., & Cecchini, J. (2014). A cluster analysis on students' perceived motivational climate: Implications on psycho-social variables. *Spanish Journal of Psychology, 17*(18), 1-13.
- *Fernandez-Rio, J., Sanz, N., Fernandez-Cando, J., & Santos, L. (2017). Impact of sustained cooperative learning intervention on student motivation. *Physical Education and Sport Pedagogy, 22*(1), 89-105.
- Gil, A., Araujo, D., Garcia-Gonzalez, L., Moreno, M., & Del Villar, F. (2014). Implications of instructional strategies in sport teaching: A nonlinear pedagogy-based approach. *European Journal of Human Movement, 32*, 104- 124.
- *Gil-Arias, A., Harvey, S., Carceles, A., Praxedes, A., & Del Villar, F. (2017). Impact of a hybrid TGfU-sport education unit on student motivation in physical education. *Public Library of Science (PLoS) One, 12*(6), 1-17.
- *Morgan, K., Kingston, K., & Sproule, J. (2005). Effects of different teaching styles on the teacher behaviours that influence motivational climate and pupils' motivation in physical education. *European Physical Education Review, 11*(3), 257-285.

- *Moy, B., Renshaw, I. & Davids, K. (2016). The impact of nonlinear pedagogy on physical education teacher education students' intrinsic motivation. *Physical Education and Sport Pedagogy*, 21(5), 517-538.
- *Perlman, D. (2012a). An examination of amotivated students within the sport education model. *Asia-Pacific Journal of Health, Sport and Physical Education*, 3(2), 141-155.
- *Perlman, D. (2012b). The influence of the sport education model on developing autonomous instruction. *Physical Education and Sport Pedagogy*, 17(5), 493-505.
- *Perlman, D. & Karp, G. (2010). A self-determined perspective of the sport education model. *Physical Education and Sport Pedagogy*, 15(4), 401-418.
- Ryan, R., & Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist Association*, 55(1), 68-78.
- *Spittle, M., & Byrne, K. (2009). The influence of sport education on student motivation in physical education. *Physical Education and Sport Pedagogy*, 14(3), 253-266.
- *Wallhead, T., Garn A., Vidoni, C. (2014). Effect of sport education program on motivation for physical education and leisure-time physical activity. *Research Quarterly for Exercise and Sport*, 85, 478-487.
- *Wallhead, T. & Ntoumanis, N. (2004). Effects of a sport education intervention on students' motivational responses in physical education. *Journal of Teaching in Physical Education*, 23, 4-18.

Appendix
Synthesis Article Grid

Author	Title	Source	Participants	Purpose	Methods & Procedures	Analysis	Findings
Chatzipanteli, A., Digelidis, N., & Papaioannou, A. (2015).	Self-regulation, motivation and teaching styles in physical education classes	Sport Discus-EBSCO Host <i>Journal of Teaching in Physical Education</i>	- Participants were 601 7 th grade students (318 boys and 283 girls) -Physical education teachers were instructors for study	Investigate the influence on student-activated teaching styles through a specific intervention program	- Reciprocal, guided discovery, self-check, inclusion, divergent, and convergent teaching styles were used -Alternative teaching style group and traditional group were both taught units of basketball, volleyball, soccer, track and field, fitness enhancement, and gymnastics -Questionnaires were given to both groups (beginning and end of 16 week period)	-Metacognitive process in physical education questionnaire -Lesson satisfaction scale -MANOVAs were computed to examine the effects of the intervention plan using as independent variables: gender, and group (experimental or comparison)	-Increased levels of intrinsic motivation and lesson satisfaction, while levels of amotivation decreased -Reverse results were found in the traditional teaching
Fernandez-Rio, J., Sanz, N., Fernandez-Cando, J., &	Impact of sustained cooperative learning intervention	Google Scholar Physical Education	-249 student participants and 4 teachers	(1) Investigate the impact of cooperative learning intervention on	-Cooperative learning or traditional teaching groups were created -Questionnaire, pre	-Perceived motivational climate questionnaire -Open-ended questions	-Quantitative data showed increases in intrinsic motivation and identified regulation, and introjected regulation in

Santos, L. (2017).	n on student motivation	n and Sport Pedagogy	enrolled in urban high school	student motivation (2) Assess students' perceptions of the cooperative learning class climate	and post test -Qualitative and quantitative data was collected	-Peer review of qualitative data -Quantitative data was analyzed using the Statistical Package for the Social Sciences	experimental (cooperative learning) group -Qualitative themes: cooperation, relatedness, enjoyment, novelty, and disappointment
Gil-Arias, A., Harvey, S., Carceles, A., Praxedes, A., & Del Villar, F. (2017).	Impact of a hybrid TGfU-sport education unit on student motivation in physical education	Google Scholar Public Library of Science (PLoS) One	55 students from a school in south-eastern Spain (M=15.45 years old)	Investigate the effect of hybrid TGfU/SEM on the impact of student motivation	-Hybrid (TGfU/SEM) group and traditional teaching group -All participants experienced both teaching groups -Hybrid group consisted of volleyball -Traditional group consisted of ultimate frisbee	-Perceived locus of causality questionnaire was used Enjoyment/Boredom scale	- Results showed higher levels of autonomous motivation, autonomy, competence, relatedness, enjoyment, and intention to be physically active, when participating in the TGfU/SEM intervention
Morgan, K., Kingston, K., & Sproule, J. (2005).	Effects of different teaching styles on the teacher behaviours that influence motivation	Sport Discus-EBSCO Host European Physical Educatio	-4 Student teachers as instructors for study -92 students as participants (mean age of 12.91	Effects of different teaching styles on motivational climate, pupils' cognition, and affective responses in physical education	-Used reciprocal, guided discovery teaching, and command teaching during different track lessons	-Lessons were filmed -Teaching behaviors were measured using a computer-code system with guidelines on how to create a mastery climate	-Reciprocal and guided discovery resulted in more mastery and less performance-focused behaviors than command/practice style. -Students scored reciprocal and guided discovery with higher

	al climate and pupils' motivation in physical education	n Review	years old)				levels of "fun", "progressed well", and "enjoyable". -Lower levels of "boredom" compared to command style
Moy, B., Renshaw, I. & Davids, K. (2016)	The impact of nonlinear pedagogy on physical education teacher education students' intrinsic motivation	Sport Discus-EBSCO Host Physical Education and Sport Pedagogy	-54 Pre-service PETE students (28 male and 26 female) -PETE educator was the primary researcher and author	To investigate whether adopting the learning design and delivery of the constraints-led approach, guided by key pedagogical principles of nonlinear pedagogy (NLP), would address basic psychological needs of learners, resulting in higher self-reported levels of intrinsic motivation.	-Action research style -Participants experienced two 50-minute hurdles lesson; one with traditional approach and the other using the constraints led approach (CLA)	-After each lesson participants completed a questionnaire that consisted of validated motivation needs such as intrinsic motivation, enjoyment and effort -A two tailed paired-samples t-test was used to compare groups' motivation subscale mean scores for each teaching approach	-Participants' reported substantially higher levels of self-determination and intrinsic motivation during the CLA hurdles lesson compared to during the traditional hurdles lesson
Perlman, D. (2012a)	An examination of amotivated students within the sport	Sport Discus-EBSCO Host Asia-Pacific	33 amotivated students	Examine perceptions and experiences of amotivated students during the SEM	-Field notes, reflective journals and interviews were used -SEM consisted of 4 units, each of approx. 14 lessons	-Case-study approach - Constant – comparative methods to analysis field notes, interviews and observations -Triangulation, peer	-Findings support exposing students to SEM -Students created friendships -Felt apart of a team -Less pressure to win=more interested in

	education model	Journal of Health, Sport and Physical Education			-Units were basketball, volleyball, flag football, and ultimate frisbee	debriefing, member checks	participating -Still others needed more time to adapt to different teaching model
Perlman, D. (2012b)	The influence of the Sport Education Model on developing autonomous instruction	Sport Discus-EBSCO Host Physical Education and Sport Pedagogy	50 pre-service physical education teachers	To provide an initial examination into the influence of using the Sport Education approach on pre-service teachers autonomous instruction	-4 week observation and mini teaching for pre-service teachers -Design and implement a 4 week team sport unit using the Sport Ed model of skill drill game approach -Lessons were recorded -	-LCQ & SMS; 4 times each unit -Teacher instruction was collected daily, - ANOVA's for teacher instruction, student perception of autonomy support and motivation	-The Sport Education Model brought about positive changes in both student perceptions of autonomous social context and teacher instruction (SEM vs. SDG model)
Perlman, D. & Karp, G.G (2010)	A self-determined perspective of the Sport Education Model	Sport Discus-EBSCO Host Physical Education and Sport Pedagogy	24 US high school physical education students (17 male, 7 female) between 15 and 18 years old	To measure motivation of secondary students in physical education using qualitative techniques within the SEM	-Case study approach grounded in the Self determination theory (SDT) -Field notes, interviews and observations were conducted	-Constant – comparative methods to analysis field notes, interviews and observations -Triangulation, peer debriefing, member checks	Emergent Themes: <i>social support</i> (inclusion & fair play/sportsmanship), <i>winning as a team</i> and <i>influence on self-determination</i> . -Aspects of the SEM supported student need for relatedness, competence and autonomy
Spittle, M., & Byrne, K. (2009).	The influence of sport	Sport Discus-EBSCO	115 8 th grade students	Investigate the influence SEM on student motivation	-Pre and post tests were conducted -Participants were	-IMI -LAPOPECQ -Cranach's alpha used	- Interest/enjoyment and effort/importance were found to be slightly higher

	education on student motivation in physical education	Host Physical Education and Sport Pedagogy	(ages 13-14 years old)		involved in SEM or traditional approach (1 day per week for 10 weeks if SEM and 5 weeks if traditional approach; 100 minutes a week)	for reliability analysis	in students that were involved in SEM -Significant differences in perceived competence, task orientation, and mastery climate (increased for SEM)
Wallhead, T., Garn A., Vidoni, C. (2014).	Effect of sport education program on motivation for physical education & LT PA	Sport Discus-EBSCO Host Research Quarterly for Exercise and Sport	568 high school students in Midwestern United States	Examine the effect of high school sport curriculum program on students' motivation for physical education and leisure-time physical activity	-SEM vs. multi-activity program -Conducted for 2 semesters	-Intrinsic motivation inventory scale (IMI) -Measured effort, enjoyment, intentions, leisure-time physical activity, autonomy, competence, and relatedness	-Increased levels of enjoyment in SEM -Decreased in effort in both approaches -Drastic decreased in effort is multi-activity program
Wallhead, T. & Ntoumanis, N. (2004).	Effects of a sport education intervention on students' motivational responses in physical education	Sport Discus-EBSCO Host Journal of Teaching in Physical Education	51 13 and 14 year old boys (north of England)	Influence of SEM intervention program on students' motivational responses at high school level	-SEM vs. traditional teaching approach	-IMI -LAPOPECQ -Enjoyment and effort were measured	- SEM increased levels of both enjoyment and effort compared to participants that were involved in a traditional teaching approach

Appendix B

Mosston and Ashworth's Teaching Styles

Implications for using particular teaching styles with talented pupils

Teaching style	Explanation	Implications for use with talented pupils
A Command	Occasionally also referred to as a 'didactic' style of teaching; the teacher makes all of the decisions related to the activity as to what, where, when and how.	Pupils with high levels of physical ability are likely to excel in response to this style as it can be used to maximise the knowledge and performance base. While perhaps maximising performance product, this style of teaching suppresses creativity and inhibits the understanding of processes involved in the acquisition of knowledge and skills.
B Practice	Teacher makes decisions before and after the activity with learner making decisions during the task. Teacher determines parameters of learning.	Pupils with high levels of cognitive ability will begin to prosper in this environment as information processed from doing the activity can be used to determine actions in subsequent tasks.
C Reciprocal	Pupils are asked to evaluate a partner's performance using set criteria within roles of observer and doer with opportunities for role reversal. Teacher determines set criteria for performance and supports pupils where necessary.	As well as continuing to facilitate quality experiences for pupils with high levels of physical and cognitive abilities, pupils with high levels of social ability should encounter appropriate provision here as they are asked to communicate effectively with their peers and recognise strengths and areas of development.
D Self-check	Similar to teaching styles B & C in that teachers will establish the learning parameters although skills learnt in C are now used to focus on learners' own improvement according to set criteria.	This style is useful for a range of abilities as self-regulation is an inherent characteristic of talented pupils. Pupils with high levels of personal ability will develop effectively in this environment as they will generally have high levels of self-esteem and relish the opportunity to build upon their strengths.
E Inclusion	A differentiated approach to teaching whereby multiple levels of performance exist in the same task allowing the pupils to determine their own entry level into the activity.	In many respects this bears similarities to the previously mentioned 'triad enrichment model'. As the level of challenge is appropriate to the needs of individuals, and they are responsible for accessing the provision at their own level, this should afford talented pupils of all abilities opportunities for success. The nature and scope of the core task will determine the successful inclusion of talented pupils.
F Discovery	Whereas teaching styles A to E rely on memory recall and associated cognitive processes the discovery style engages the learner in the production of ideas and discovery of concepts. Allowing the learner the opportunities to develop and apply different ideas is fundamental in this style of teaching.	Pupils with high levels of creativity will flourish in this environment as they begin to flex their minds to the range of options available in response to the stimulus provided by the teacher. Some talented pupils with high levels of physical ability who have relatively low levels of creativity may prefer more structured environments and become frustrated with the lack of direction.
G Guided discovery	The teacher asks questions to lead pupils into specific areas of discovery.	As a result of the implications for using a discovery teaching style mentioned above, this style may be more suitable for teachers to challenge pupils with high levels of physical ability in a slightly more structured manner than F. This should then allow them to experiment with previously learned information and skills outside of their usual comfort zone.
H Divergent style	This teaching style requires teachers to design problems that elicit a series of alternative solutions.	For pupils with high levels of cognitive and creative ability this environment is extremely productive. Whereas previously pupils responded in different ways using previously acquired skills and information now diversity of thought is the key.