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The influence of Sport Education on student motivation in physical education

Michael Spittle* and Kate Byrne

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Background: Physical educators are faced with trying to provide motivating and enjoyable experiences in physical education. Sport Education is an instructional model that aims to provide positive motivational sport experiences by simulating the features of authentic sport. Research support for Sport Education is positive, however, the effects on student motivation and the motivational climate are not well understood.

Purpose: To investigate the influence of the Sport Education model on student motivation (intrinsic/extrinsic motivation, goal orientations, and perceived motivational climate) in secondary physical education.

Setting: Six classes were selected according to teacher and class availability in the sports of soccer, hockey, and football codes in a co-educational government school.

Participants: Participants were 115 (male = 97, female = 18) Year-8 students (aged 13–14 years), in a Sport Education condition (n = 41) and a Traditional condition (n = 74).

Measures: At pre- and post-test, all participants completed three questionnaires: the Intrinsic Motivation Inventory, the Task and Ego Orientation in Sport Questionnaire, and the Perceived Motivational Climate in Sport Questionnaire.

Intervention: Participants completed either a Sport Education condition or a Traditional condition for one double period (100 minutes) one day per week for 10 weeks (Sport Education condition) or for five weeks (Traditional condition). The Sport Education condition incorporated six distinctive features: seasons, affiliation, formal competition, record keeping, festivity, and a culminating event. The Traditional condition used whole-group instruction led by the teacher.

Research design: The study used a non-equivalent control group design with pre- and post-test procedures. The independent variable was teaching condition and the dependent variable was student motivation (assessed by intrinsic motivation, goal orientations, and motivational climate). The groups were already established and selected for convenience purposes.

Data collection and analysis: Participants completed pre-test measures and then participated in their pre-established classes. Post-test measures were completed in the last class in each condition. A reliability analysis on measures was conducted using Cronach’s alphas. A pre-test manipulation check was performed to check for any initial differences in motivation. To compare the difference in changes between conditions on motivation, a series of 2 × 2 repeated measures analyses of variance were conducted. A comparison of the relationship between motivation measures was conducted using Pearson’s product moment correlation coefficients.

Findings: There was a significant difference between the conditions on changes in perceived competence, task orientation, and mastery climate, with the Traditional condition decreasing significantly from pre- to post-test compared with the Sport Education condition. There were no significant differences on interest/enjoyment, effort/importance, pressure/tension, ego orientation, or performance climate. A mastery
climate was positively related to task orientation and intrinsic motivation and a performance climate was related to ego orientation.

Conclusions: The Sport Education condition was more successful in maintaining high levels of intrinsic motivation, task orientation, and mastery climate than the Traditional condition. That is, the Traditional condition was associated with a decrease in adaptive aspects of motivation for students, whereas the Sport Education condition maintained existing levels of motivation.

Keywords: sport education; intrinsic motivation; goal orientations; motivational climate

Introduction

Student motivation in physical education declines as students progress through school (Mowling et al. 2004). Consequently, an issue for physical educators is how to motivate students in physical education. Two areas of motivation that have been studied extensively in education and sport are intrinsic motivation and achievement motivation (Treasure and Roberts 2001; Zahariadis and Biddle 2004). Intrinsic motivation occurs when individuals engage voluntarily in an activity for its own sake, whereas, extrinsic motivation occurs when individuals are motivated by external factors, such as rewards and social recognition (Gill 2000). Intrinsically motivated individuals show interest and experience enjoyment in the activity (Deci and Ryan 1985; Pelletier et al. 1995; Ntoumanis 2001), and adhere to participation better than extrinsically motivated individuals (Ryan et al. 1997).

A focus in the achievement motivation literature has been on achievement goals and motivational climate (Carpenter and Morgan 1999; Roberts 2001). There are two primary achievement goals: a task goal orientation and an ego goal orientation (Nicholls 1989), which are also known as learning and performance goals (Dweck and Leggett 1988) or mastery and ability goals (Ames 1992). An individual with a task orientation uses self-referenced goals that are based on learning or task mastery, whereas, an individual with an ego-orientation uses norm-referenced goals that are based on demonstrating ability. These goal orientations influence behavioural and affective responses, such as choice of activity, satisfaction, and enjoyment, with motivation more likely to be enhanced through the promotion of a task orientation rather than an ego orientation (Treasure and Roberts 2001; Zahariadis and Biddle 2004). It appears that as adolescents progress through high school they tend to develop a stronger ego goal orientation (Xiang, Lee, and Shen 2001), which corresponds with reduced motivation in physical education (Mowling et al. 2004). A task orientation is often linked with intrinsic motivation because of its focus on internal control and task mastery (Goudas et al. 1995; Duda et al. 1995). An ego orientation has been linked with more extrinsic motives because of a focus on status motives and recognition incentives (Zahariadis and Biddle 2004).

An individual’s motivation can be influenced considerably by the motivational climate (Weinberg and Gould 2003). An environment that is perceived to involve positive reinforcement of effort, improvement, and cooperation is described as a mastery climate. An environment that is perceived to reinforce social comparison, competition, and punishment for mistakes is described as a performance climate. Research assessing the relationship between goal orientations and motivational climate in physical education is limited, but has suggested that the perceived motivational climate does influence goal orientations, with a mastery climate leading to a task orientation and a performance climate leading to an ego orientation (Carpenter and Morgan 1999; Treasure and Roberts 2001). An individual’s goal orientation, coupled with the perceived motivational climate, can also impact on an
individual’s intrinsic motivation (Roberts 2001). As a consequence, it is necessary to assess intrinsic motivation, goal orientations, and motivational climate as separate constructs, but also as interdependent variables.

Because the motivational climate influences individual motivation, manipulating the learning environment or climate might encourage the development of desirable motivational orientations. Physical educators can adopt various models of instruction, which could have different outcomes on motivation. Traditional physical education instruction tends to be based on content (Metzler 1999). Instruction is largely determined by the activity being taught, whether that is cricket, soccer, archery, or dance, so the activity is taught in the same way to different grade levels and the content, structure, and sequencing of learning activities remains quite similar. The Sport Education approach aims to shift the focus from content to skills, values, and attributes. The Sport Education model aims to provide positive motivational sport experiences in physical education by simulating the features of authentic sport (Siedentop 1994). Siedentop (1994) developed the Sport Education model to encompass six distinctive features: seasons (one season over a 10-week term); affiliation (students are arranged into teams and plan, practice and compete together throughout the entire season); formal competition (a game schedule with interspersed practice sessions); record keeping (formal records are kept on game play to assist with feedback, motivation, and assessment); festivity (continual festivity throughout the season to celebrate improvements, fair play, and genuine efforts); and a culminating event (a final game to determine the overall winner of the season and a celebration to recognise all accomplishments). A major feature of the Sport Education model is its emphasis on student-centred learning. It aims to provide experiences that are deeper and more complete than typical physical education approaches (Siedentop 1998). Its primary goals are to develop students who are competent, literate, and enthusiastic sportspeople (Siedentop 1994, 1998).

These objectives of the Sport Education model relate favourably to the positive predictors of intrinsic motivation. A literate sportsperson might be viewed as having high levels of perceived effort and view the activity as important. A competent sportsperson is likely to be high on perceived competence. The structure of the Sport Education model aims to create inclusiveness, through student-centred learning teams, by promoting affiliation and creating a sense of belonging. This team affiliation and positive bonding with fellow teammates may influence the motivation of students. Social learning and student empowerment might be augmented through use of the Sport Education model and it appears that if a student feels they have greater control over the perceived outcomes of a unit their intrinsic motivation might simultaneously increase.

A recent review by Wallhead and O’Sullivan (2005) reported that the available research is supportive of Sport Education as a physical education instructional method in secondary schools. Although not usually investigated directly, there is some indirect support for the positive effect of Sport Education on student motivation through changes in factors that appear to relate to student motivation, such as student enthusiasm (e.g., Alexander and Luckman 2001), student involvement and participation (e.g., Alexander, Taggart, and Thorpe 1996; Bennett and Hastie 1997; Hastie 1996, 1998c), equitable participation and inclusivity (e.g., Alexander, Taggart, and Thorpe 1998; Curtner-Smith and Sofo 2004; Hastie 1996, 1998b; Kinchin and O’Sullivan 2003), social responsibility and empowerment (e.g., Alexander, Taggart, and Thorpe 1996; Kinchin and O’Sullivan 2003; Richardson and Oslin 2003), and skill and tactical development (e.g., Curtner-Smith and Sofo 2004; Hastie 1998a, 1998b; Hastie and Buchanan 2000).
In their review of the Sport Education literature, Wallhead and O’Sullivan identified 62 peer-reviewed journal articles. Of these 62 articles, 34 were classified as focusing on discussion of practical strategies to implement the Sport Education model and 28 were designed to evaluate the influence of the Sport Education model on aspects of student learning. Much of the evaluative research was based on teachers’ perceptions of the Sport Education model and on qualitative data rather than objective data from the point of view of the student and, while this research has been very helpful in developing an understanding of Sport Education; other methodological approaches are needed to further our knowledge. In those studies that have investigated student perceptions, the sample sizes have generally been small and the designs have not incorporated appropriate comparison groups. To supplement the existing literature, what is needed are studies that focus on objective measures of student perceptions using appropriate comparison groups and adequate sample sizes that are based on appropriate theoretical models of student motivation in physical education.

One study that has investigated the effects of Sport Education on enjoyment, motivation, perceived effort, and perceived competence for physical education was conducted by Wallhead and Ntoumanis (2004). They compared the responses of 51 male secondary students in two physical education classes to a basketball unit taught using a Sport Education approach or a traditional teacher-led approach. Classes were conducted for one hour per week over an eight-week period. Students completed the Intrinsic Motivation Inventory (IMI), the Task and Ego Orientation in Sport Questionnaire (TEOSQ), the Academic Self-Regulation Questionnaire (ASRQ) and the Learning and Performance Orientations in Physical Education Classes Questionnaire (LAPOPECQ) one week before and one week after the completion of the unit. They found that Sport Education led to increased enjoyment and perceived effort and a task-involving climate. Although the study utilised a quantitative approach with established measures and a suitable comparison group, there were several limitations to the study. The teacher of the two classes was also the researcher and was, therefore, aware of the purpose of the study; the Sport Education unit only ran for an eight-week period; and the sample size was quite small, comprising only one class of students undertaking Sport Education and one class undertaking the traditionally taught unit. The current study replicates and extends much of the Wallhead and Ntoumanis (2004) study, by utilising a larger sample size, a full 10-week Sport Education unit, more sports, teachers who were not the researcher, and a different measure of motivational climate.

The purpose of the current study was to investigate the influence of the Sport Education model on student motivation in secondary physical education. A Traditional teaching condition was used as a comparison condition. Student motivation was assessed in terms of intrinsic motivation, goal orientations, and perceived motivational climate. It was hypothesised that interest/enjoyment, perceived competence, effort/importance, task orientation, and a mastery-oriented motivational climate would increase significantly more, and that pressure/tension, ego orientation and a performance-oriented climate would decrease significantly more in a Sport Education condition than in a Traditional teaching condition. In addition, a correlational analysis was performed to investigate the relationship between intrinsic motivation, goal orientations, and motivational climate. It was hypothesised that a mastery climate would be related to a task orientation and increased intrinsic motivation and a performance climate would be related to an ego goal orientation and reduced intrinsic motivation.
Method

Participants
Participants were 115 (male = 97, female = 18) Year-8 students (aged 13–14 years) from a co-educational government high school. Six classes were selected according to teacher and class availability in the sports of soccer, hockey, and football codes (a combination of Australian Rules Football, Gaelic football, and Touch football). This approach led to a sample of 41 participants in the Sport Education condition and 74 participants in the Traditional condition. There were 17 students in the Sport Education hockey class, 13 students in the Sport Education soccer class, 11 students in the Sport Education football codes class, 21 students in the Traditional hockey class, and 26 and 27 students in the two Traditional soccer classes. Female participants were matched evenly across the two instructional models, with nine female participants in the Sport Education hockey class and nine female participants in the Traditional hockey class.

Measures
At pre- and post-test, all participants completed three questionnaires to assess intrinsic motivation, goal orientations, and perceived motivational climate.

Intrinsic motivation
Intrinsic motivation for sport and physical education was measured using the IMI (Ryan 1982), as reworded for use in sport settings by McAuley, Duncan and Tammen (1989). Participants responded to 18 items, which assessed four underlying dimensions of intrinsic motivation: enjoyment/interest, effort/importance, perceived competence, and pressure/tension. For example, in a soccer class, questions included ‘I enjoyed this soccer class very much’ (interest/enjoyment), ‘I put a lot of effort into this soccer class’ (effort/importance), ‘I think I am pretty good at soccer’ (perceived competence), and ‘It was important for me to do well in this class’ (pressure/tension). Participants responded on a five-point Likert scale from 1 (very strongly disagree) to 5 (very strongly agree). The IMI has been found to have adequate validity and reliability when used with adolescents in physical education (Goudas and Biddle 1994; Mitchell 1996).

Goal orientations
Goal orientations were assessed using the TEOSQ (Duda and Nicholls 1992). The TEOSQ consisted of 13 items that asked participants to think of when they felt most successful in physical education. For example, ‘I feel most successful in sport when I work really hard’ (task orientation) and ‘I feel most successful in sport when I’m the best’ (ego orientation). Participants responded on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Research in physical education and sport has demonstrated adequate validity and reliability of the TEOSQ (Duda et al. 1992; Duda and Whitehead 1998; Magyar, Feltz and Simpson 2004).

Perceived motivational climate
The perceived motivational climate was measured with the Perceived Motivational Climate in Sport Questionnaire (PMCSQ). The PMCSQ consisted of 21 items containing two
subscales: performance climate and mastery climate. Participants were asked to think about what it was like participating in their physical education class. For example, in this physical education class: ‘Students feel good when they do better than their teammates’ (performance climate), ‘Students are punished for mistakes’ (performance climate), ‘Trying hard is rewarded’ (mastery climate), and ‘Each student’s improvement is important’ (mastery climate). Participants rated the climate on a five-point Likert scale from 1 (strongly agree) to 5 (strongly disagree). The PMCSQ is reported to have acceptable validity and reliability (Walling, Duda, and Chi 1993).

Conditions
A Sport Education condition was compared with a Traditional teaching condition. For both conditions, the teachers were not assigned by the researcher, but had taught extensively using the respective instructional approach.

Sport Education condition
Participants in the Sport Education condition completed one double period (100 minutes) one day per week for 10 weeks. The sports participated in were hockey, soccer, and football codes. The Sport Education condition incorporated Siedentop’s (1994) six distinctive features: seasons, affiliation, formal competition, record keeping, festivity, and a culminating event. To begin the unit, the teacher decided on the number of teams that would be participating in the Sport Education season and the students were then required to nominate a selector for each team. The student selectors and the teacher then selected matched mixed-ability teams. Following the selection process, the teacher drew the selectors’ names out of a hat to randomly assign each selector to a team. Within these teams, students were required to select people to undertake certain student roles, such as captain and coach. Other student roles that were experienced during the season were player, selector, captain, coach, referee, scorer, publicity officer, and social committee officers. The Sport Education condition tended to follow a three-phase format: an initial, largely teacher-directed, skill development phase; followed by a student-led activities and games phase; and finally a formal competition phase.

The initial phase consisted of three to four weeks of largely teacher-directed instruction to increase students’ knowledge of the games including skills, drills, and basic rules. A typical lesson would begin with students conducting the attendance roll for their teams and a team warm-up; followed by an explanation and demonstration of various skills and drills by the teacher; then some student-controlled game-based activity; and concluded with a modified game umpired by the teacher and another nominated student. During the student-led phase of five to six weeks, the students were responsible for the conduct of skill drills, activities, and games. The teams were required to organise and perform their own aerobic and skill-based warm-up in preparation for the formal competition phase. A round robin game schedule was implemented to augment participation and during this time the duty team took responsibility for the refereeing, scoring, and administrative duties. The final phase, the culminating event, included a final series where teams played off. The students were responsible for the running of this event, with activities including refereeing, scoring, and timekeeping. A presentation ceremony was carried out at the conclusion of the season to recognise achievements, improvements, and fair play performances.
Traditional condition

Participants in the Traditional condition completed one double period (100 minutes) per week for five weeks. The sports participated in were soccer and hockey. The lessons conducted in the Traditional condition were very similar over the duration of the study. A typical lesson began with an aerobic warm-up of approximately 10 minutes; followed by 5 minute static and dynamic stretches; followed by 30–40 minute skill development via the use of sport-specific drills organised by the teacher performed both individually and in small groups; and the final 30–40 minute encompassed game play, generally with two matched mixed-ability teams, which were again selected by the teacher. The teacher was not instructed specifically on how to teach the class, except that it should be a ‘normal’ physical education class. The teacher generally used whole-group instruction with minimal individual feedback. The majority of decisions were made by the teacher and students were not responsible for roles such as refereeing and scoring, unless they were non-participants.

Procedure

After informed consent was provided, participants completed the pre-test measures during the first 10 minutes of their class. Questionnaires were completed individually and anonymously. Participants then participated in their pre-established classes, either the Traditional condition or the Sport Education condition. The post-test measures were completed in the last 10 minutes of the last class in each condition.

Design

The design of the study was a non-equivalent control group design using pre- and post-test procedures. The independent variable was the teaching condition and the dependent variable was student motivation (assessed by intrinsic motivation, goal orientations, and motivational climate). The Traditional condition was utilised as a comparison condition to evaluate the effect of the Sport Education condition on student motivation. The sample groups were already established and selected for convenience purposes. The selection procedure of participants utilised the non-equivalent control group design, which recognises that the sample groups may differ and may not be entirely equal in terms of various characteristics.

Data analysis

An initial reliability analysis on the measures using Cronach’s alphas was conducted to determine their reliability. As the research design was a non-equivalent control group design, a manipulation check was performed at pre-test to check for any initial differences in motivation. To compare the difference in changes between the two instructional conditions on motivation, a series of $2 \times 2$ repeated measures analyses of variance (ANOVAs) were conducted with follow-up paired-sample $t$-tests conducted for significant ANOVAs. A comparison of the relationship between intrinsic motivation, goal orientations, and motivational climate was conducted using Pearson’s product moment correlation coefficients.

Results

Reliability

Cronach’s alpha coefficients for both conditions and all measures at pre- and post-test are displayed in Table 1. According to Nunnally’s (1978) cut-off criterion of .70 for the
psychological domain, the majority of the subscales were considered acceptable, with the exception of the IMI subscales of perceived competence at pre-test and pressure/tension at pre-test and post-test. Further analyses were conducted to establish which items within these subscales were affecting the reliability of the IMI. To improve the reliability of the measures, IMI items 2 and 15 were removed from further analysis. This improved the reliability of the IMI subscales of perceived competence to .72 at pre-test and pressure/tension to .70 at pre-test and .60 at post-test.

**Manipulation check**

Table 2 presents the descriptive statistics related to the measures at pre- and post-test. A manipulation check was performed to compare the conditions at pre-test for any initial differences in motivation due to the use of a non-equivalent control group design. There were no significant differences between the Sport Education and Traditional

<table>
<thead>
<tr>
<th>Measure</th>
<th>Subscale</th>
<th>Condition</th>
<th>Pre-test M</th>
<th>Pre-test SD</th>
<th>Post-test M</th>
<th>Post-test SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMI</td>
<td>Interest/enjoyment</td>
<td>Sport Education</td>
<td>18.85</td>
<td>4.40</td>
<td>20.90</td>
<td>3.94</td>
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<td></td>
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<td>18.92</td>
<td>4.15</td>
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<td>15.61</td>
<td>3.07</td>
<td>16.59</td>
<td>2.62</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>16.43*</td>
<td>2.95</td>
<td>15.65*</td>
<td>2.90</td>
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<td></td>
<td>Effort/importance</td>
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<td>15.85</td>
<td>3.01</td>
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<td>7.39</td>
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<td></td>
<td>Traditional</td>
<td>8.12</td>
<td>2.39</td>
<td>8.46</td>
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<td>TEOSQ</td>
<td>Task orientation</td>
<td>Sport Education</td>
<td>25.54</td>
<td>4.86</td>
<td>25.05</td>
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<td></td>
<td></td>
<td>Traditional</td>
<td>26.32*</td>
<td>4.67</td>
<td>24.47*</td>
<td>5.13</td>
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<td>14.07</td>
<td>4.89</td>
<td>13.27</td>
<td>4.60</td>
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<td></td>
<td></td>
<td>Traditional</td>
<td>16.03</td>
<td>5.45</td>
<td>15.96</td>
<td>4.80</td>
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<td>PMCSQ</td>
<td>Performance climate</td>
<td>Sport Education</td>
<td>34.61</td>
<td>8.58</td>
<td>32.20</td>
<td>8.96</td>
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<td></td>
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<td>33.49</td>
<td>7.83</td>
<td>34.64</td>
<td>6.84</td>
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<td></td>
<td>Mastery climate</td>
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<td>6.34</td>
<td>32.59</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Traditional</td>
<td>35.00*</td>
<td>5.61</td>
<td>32.14*</td>
<td>5.67</td>
</tr>
</tbody>
</table>

*Note: *p < .05.*
conditions before the intervention for interest/enjoyment ($t_{(113)} = -1.79; p = .08$; $d = -.04$), perceived competence ($t_{(113)} = -1.60; p = .32; d = -.03$), effort/importance ($t_{(113)} = -.88; p = .38; d = -.02$), pressure/tension ($t_{(113)} = -1.43; p = .16; d = -.03$), task orientation ($t_{(113)} = -.86; p = .40; d = -.17$), ego orientation ($t_{(113)} = -1.91; p = .06; d = -.04$), performance climate ($t_{(113)} = .71; p = .48; d = .01$) or mastery climate ($t_{(113)} = -1.64; p = .10; d = -.03$).

**Changes in intrinsic motivation**

No significant Group x Time interactions were found for interest/enjoyment (Wilks’ $\Lambda = .992; F_{(1,113)} = .87; p = .35; \eta^2 = .01$), effort/importance (Wilks’ $\Lambda = 1.00; F_{(1,113)} = .55; p = .46; \eta^2 = .01$), or pressure/tension (Wilks’ $\Lambda = 1.00, F_{(1,113)} = .53; p = .47; \eta^2 = .01$). A significant Group x Time interaction was found for perceived competence (Wilks’ $\Lambda = .92; F_{(1,113)} = .12; p = .002; \eta^2 = .08$), with a medium effect size. Follow-up pairwise comparisons (paired-samples $t$-tests) indicated that there was no significant difference between pre- to post-test scores on perceived competence for the Sport Education condition ($t_{(41)} = -1.95; p = .06; d = -.30$), but there was a significant decrease on perceived competence scores for the Traditional condition ($t_{(74)} = 2.62; p = .01; d = .31$).

**Changes in goal orientations**

A significant Group x Time interaction was found for task orientation (Wilks’ $\Lambda = .94; F_{(1,113)} = 6.73; p = .01; \eta^2 = .06$), a medium effect size. No significant Group x Time interaction was found for ego orientation (Wilks’ $\Lambda = .99; F_{(1,113)} = 6.97; p = .41; \eta^2 = .01$). Follow-up pairwise comparisons (paired-samples $t$-tests) on pre- to post-test scores on task orientation indicated that there was no significant difference for the Sport Education condition ($t_{(40)} = .56; p = .58; d = .09$), but there was a significant difference for the Traditional condition ($t_{(73)} = 3.98; p = .00; d = .46$), with lower scores at post-test. This indicates that task orientation decreased significantly for the Traditional condition from pre- to post-test.

**Changes in motivational climate**

No significant Group x Time interaction was found for performance climate (Wilks’ $\Lambda = 1.00; F_{(1,113)} = .60; p = .44; \eta^2 = .01$), however, a significant Group x Time interaction was found for mastery climate (Wilks’ $\Lambda = .93; F_{(1,113)} = .84; p = .005; \eta^2 = .07$), a medium effect size. Follow-up pairwise comparisons (paired-samples $t$-tests) indicated no significant change in mastery climate for the Sport Education condition ($t_{(40)} = .45; p = .65; d = .07$), but a significant decrease in scores in the Traditional condition for mastery climate ($t_{(73)} = 4.95; p = .000; d = .58$).

**Relationship between motivational climate, goal orientation, and intrinsic motivation**

The correlations between motivational climate, goal orientation, and intrinsic motivation are presented in Table 3. Mastery climate was positively related to task orientation and intrinsic motivation and a performance climate was related to ego orientation.
Discussion

The purpose of this study was to investigate the influence of the Sport Education model on student motivation in secondary physical education. There was a significant difference between the Sport Education and Traditional conditions on changes in perceived competence, task orientation, and mastery climate, with these measures decreasing from pre- to post-test in the Traditional condition compared with the Sport Education condition. There were no significant differences in interest/enjoyment, effort/importance, pressure/tension, ego orientation, or performance climate. The results suggest that the Sport Education condition was more successful in maintaining high levels of intrinsic motivation, task orientation, and mastery climate than a Traditional teaching approach. That is, the Traditional condition was associated with a decrease in adaptive aspects of motivation for students, whereas the Sport Education condition maintained existing levels of motivation.

Previous research on the Sport Education model has suggested that it is associated with student enthusiasm, involvement, and participation (see Wallhead and O’Sullivan 2005). These factors are likely to be associated with increased motivation. Wallhead and Ntoumanis (2004) found that Sport Education lead to increased enjoyment and perceived effort and a task-involving (mastery) climate. The current study was also supportive of the effects of Sport Education on a mastery climate. Interestingly, unlike Wallhead and Ntoumanis (2004), there was no significant difference in enjoyment or perceived effort, but there was a significant difference in perceived competence and task orientation. Therefore, although both studies supported the motivational effects of Sport Education, it was through different aspects of motivation. Also, Wallhead and Ntoumanis (2004) found that Sport Education led to significant increases in motivation, whereas in the present study, the differences between the conditions were due largely to decreases in the Traditional condition. Both studies did suggest that the perceived motivational climate was more mastery oriented in the Sport Education condition than the Traditional condition, which is likely to be associated with a task orientation and positive motivation (Treasure and Roberts 2001). Worryingly, the Traditional condition was associated with decreases in perceived competence, task orientation, and mastery climate. The reasons for these effects could be due partly to high initial levels of motivation. At pre-test, scores on the IMI, TEOSQ, and PMCSQ for both conditions were quite high for the adaptive

<table>
<thead>
<tr>
<th></th>
<th>IMI 1</th>
<th>IMI 2</th>
<th>IMI 3</th>
<th>IMI 4</th>
<th>TEOSQ 5</th>
<th>TEOSQ 6</th>
<th>TEOSQ 7</th>
<th>TEOSQ 8</th>
<th>PMCSQ 7</th>
<th>PMCSQ 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMI 1</td>
<td>1</td>
<td>.72***</td>
<td>.80***</td>
<td>−.12</td>
<td>.64***</td>
<td>.02</td>
<td>.61***</td>
<td>−.40***</td>
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<td></td>
</tr>
<tr>
<td>IMI 2</td>
<td></td>
<td>2</td>
<td>.70***</td>
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Notes: 1, Interest/enjoyment; 2, Perceived competence; 3, Effort/importance; 4, Pressure/tension; 5, Task orientation; 6, Ego orientation; 7, Mastery climate; 8, Performance climate. *p < .05; **p < .01; ***p < .001.
motivational scales and quite low for the maladaptive motivational scales. This could indicate a possible ceiling effect, where scores were unlikely to increase. It must also be noted that a number of the motivational scales measured in the current study did not show any difference between the two conditions. Similarly, Wallhead and Ntoumanis (2004) found no differences on a number of the motivational variables they investigated.

The significant differences between the conditions on perceived competence, task orientation, and mastery climate make sense according to theoretical models, because the motivational climate is likely to influence goal orientation and intrinsic motivation (Weinberg and Gould 2003). It would be expected that changes in mastery climate would lead to changes in task orientation (Treasure and Roberts 2001) and intrinsic motivation (Zaharias and Biddle 2004). This was confirmed by the correlational analysis, which suggested that a mastery climate was positively related to task orientation and intrinsic motivation, and a performance climate was related to ego orientation.

The reliability analysis supported the reliability of the TEOSQ and PMCSQ reported in previous research (e.g., Duda and Nicholls 1992; Duda and Whitehead 1998). Previous research has found that the IMI has adequate reliability when used with adolescents in physical education (Goudas and Biddle 1994; Mitchell 1996). In the current study, internal consistency of subscales of perceived competence and pressure/tension were below the acceptable cut-off criterion (Nunnally 1978). Some students may not have fully understood the meaning of some of the words (e.g., anxiety and competence). For example, items included: ‘I was anxious while playing soccer’ and ‘After playing soccer for a while, I felt pretty competent’. Future research should continue to investigate the reliability of the IMI using adolescent samples. Alternatively, studies might consider utilising alternative questionnaires, such as the Sport Motivation Scale (SMS) (Pelletier et al. 1995).

Although the findings of the current study add to and extend the existing Sport Education evidence base by filling some gaps in the literature, there were several limitations of the study that need to be addressed. The study adopted a non-equivalent control group design where participants were already in pre-established groups. The manipulation check at pre-test suggested that there were no pre-existing differences in motivation between the conditions, but this was not controlled for in the design. The sample size was 115 students in six classes, larger than most previous research, but was influenced by teacher availability and class size. Student absences were not controlled for, so some students were excluded from the sample because they did not complete both the pre- and post-test and some students who completed both the pre- and post-test may have been absent from some of the classes. In addition, the sample was all from one school and one year level, which is likely to reduce the number of extraneous variables, but might limit the generalisability of the findings. Future research designs could adopt larger samples from multiple schools.

One of the limitations of a study in a naturalistic or real-life setting is a reduction in internal validity. In the current study there were several confounding variables that were not controlled for or measured; consequently it is difficult to conclude a causal relationship between the independent variable and the dependent variables. Other factors may have influenced the motivational outcomes of students. Because the classes were already established, and not set up specifically for this study, teachers taught the Sport Education classes as they ‘normally’ did without specific instruction by the researchers on how to teach and, consequently, it is likely that what teachers did influenced the findings. Although this reduces the internal validity of the study, it is likely to have increased the ecological
validity. That is, the research was conducted on Sport Education classes as they are actually delivered in a secondary school, not just as defined by the researchers. The researchers recommend that future studies consider having tighter control over confounding variables or measure these variables.

The influence of the teacher must be considered as a limitation of the design. Different teachers were responsible for the classes and their interaction and instructional approach is likely to have had some impact on motivation. The practices of the teachers were not measured in the study. In addition, teacher intention was not controlled for or measured. Teachers’ goals or intentions for classes are likely to have an impact on student outcomes, including motivation. For example, it is possible that teachers were aiming to increase motivation, confidence or game performance, and these goals will influence whether students’ levels of motivation, engagement, or skill performance increased. As discussed previously, this could limit the internal validity of the study.

The length of the conditions was also a limitation of the design. The Sport Education condition was implemented over 10 weeks and the Traditional condition was implemented over five weeks. Thus, there could be difficulties with comparing interventions of different durations. This was due partly to the use of pre-existing groups, but also represented what tends to happen in a school context. That is, the Sport Education model is designed for a 10-week term (Siedentop 1994), however, traditional physical education classes rarely spend that amount of time on one sport.

A related issue to duration of the Sport Education condition is the distribution of sessions. There are 10 weeks in a Sport Education season, and in the current study this consisted of one session per week. The early sessions, three to four weeks, were largely teacher-directed. This means that only five or six weeks were heavily student-lead, which may reduce opportunities for students to experience the responsibilities associated with the roles they have adopted. Although this would alter the traditional format of Sport Education, future research might explore the impact of manipulating the distribution and amount of student-lead and teacher-lead sessions or activities incorporated in Sport Education.

Future research on the Sport Education model is encouraged to continue to develop and expand the existing literature. Some ideas for future research include examining the model’s influence on other closely related motivational variables, such as self-efficacy, self-confidence, and self-concept, as well as other expected outcomes such as competence and understanding of the sport. Another issue is whether increased (or maintained) motivation leads to an increase in sport and physical activity participation as would be expected by the model with its aim of producing enthusiastic sportspeople (Siedentop 1998). This highlights the need for longitudinal research and research that examines the effect of the Sport Education model on sport and physical activity participation beyond the classroom.

As the physical education curriculum faces further time constraints, it is important that teachers utilise the most effective instructional approach for enhancing student motivation. Adoption of an instructional model may be dependent on the desired outcomes of a physical education unit. For example, the Traditional model may be useful if skill development is desired, the Teaching Games for understanding model could be implemented if tactical development is a priority, and if motivation is an important outcome, the Sport Education model might be an appropriate instructional model. Using a combination of instructional approaches might be the most effective way to enhance students’ motivation to provide a variety of experiences. Although there were some limitations of the current study, it did
attempt to address many of the issues raised in the Sport Education literature. The results suggested that the Sport Education condition was more successful in maintaining high levels of intrinsic motivation, task orientation, and mastery climate than the Traditional condition.

References


