

# Physical Education on Students' Motivation

Subjects: Environmental Studies

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The SEM is a curriculum and instructional model created to provide richer sports-related experiences for students during PE classes. The model is organized around a series of characteristics, which are, (1) units are considered seasons, (2) students are members of intact teams, (3) participation in formal competition, (4) students maintain roles beyond players, (5) formal records are kept, and (6) students participate in a culminating event.

Keywords: SEM ; sports education ; motivation ; student behavior ; attitude ; self-determination-theory

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## 1. Introduction

The model was created because physical education (PE) classes should not be limited to teaching techniques and tactics from multiple sports. PE should make students cultivate their habits of exercising and improve their sports culture along the way <sup>[1]</sup>. The SEM is a curriculum and instructional model created to provide richer sports-related experiences for students during PE classes <sup>[2]</sup>. The model is organized around a series of characteristics, which are, (1) units are considered seasons, (2) students are members of intact teams, (3) participation in formal competition, (4) students maintain roles beyond players, (5) formal records are kept, and (6) students participate in a culminating event <sup>[2]</sup>.

Motivation is important to influence students' learning <sup>[3]</sup>. Especially, intrinsic motivation has a positive impact on students' behavior and learning during PE <sup>[4]</sup>. Some studies related to intrinsic motivation in PE and sports have indicated that this construct is positively associated with self-effort and predisposition to participate in future physical activities <sup>[5][6]</sup>. For the teacher to improve these capacities in the students, they may impose tasks related to personal control or self-competence that will improve several adaptive responses to motivational imposes <sup>[7]</sup>.

Most research acknowledges that the SEM as a more effective model than the traditional and direct instruction model in various factors like students' attitudes, motivation, or self-determination towards PE <sup>[8]</sup>, mainly in low-performing students <sup>[9]</sup>. According to the self-determination theory, intrinsic motivation is promoted by fulfilling competence, autonomy, and relatedness <sup>[10]</sup>. For example, characteristics of the SEM, such as the festive finale, the student-centered approach and autonomy, engagement, and peer relationships in PE, can contribute to greater motivation <sup>[11][12]</sup>. In addition, the use of dynamic roles during the classes is viewed as an aspect with a very high relation to students' motivation <sup>[13]</sup>.

One of the objectives of PE is the increase of physical activity (PA) levels and motivation for PA in and out of school. Research suggests that students' motivation in PE following the SEM is significantly higher than students receiving traditional PE <sup>[8][9][14][15]</sup>. However, to better ascertain the role of the SEM on motivation, it is important to summarize the existing evidence. Thus, the objective of this study was to analyze the impact of the SEM on the motivation for PA.

## 2. Development and Findings

The majority of the 14 studies were performed in Spain (9), China (3), United States (1), and England (1). All, except one study <sup>[16]</sup>, used a theoretical framework of motivation in their investigation. All 14 studies included descriptions of the SEM, discuss the relationship between the SEM and motivation and enjoyment in PE (8), social affiliation (2), PA participation (2), and some other motivational outcomes (7). The greatest number of articles achieved this assessment criterion.

(n = 1132 boys, n = 950 girls) from the 14 included studies. Most studies were performed in high schools (aged 14–17) While most studies examined the SEM in a co-educational context, one examined boys in a single-sex PE context <sup>[17]</sup>. Moreover, three studies described the ethnicity of the participants <sup>[17][18][19]</sup>.

Six studies did not describe participants' eligibility criteria and selection <sup>[13][20][16][21][22][23]</sup>. Twelve of them included information about teachers' experiences in sport education and/or PE <sup>[8][13][17][14][20][16][24][21][22][18][19][23]</sup>, but only seven reported students' experiences <sup>[9][17][14][15][24][21][23]</sup>.

All studies but two [13][22] included more than one class regarding PE settings. Three studies did not specify how many classes are included [14][15][24]. Eight studies included one school, two included two schools [18][23], while four look at the setting of secondary educational centers, instead of regular schools [14][20][24][22].

Seven studies used a quasi-experimental design [8][9][13][20][24][22][23] and three nonequivalent control-group designs [17][16][18] to investigate the motivational impact of a the SEM program by including one intervention and one control group, except for one study that had three different intervention groups [8]. Two studies used a pre-experimental pre-/post-test design [14][15], one study used a crossover design [21], and another one used a cluster randomized study design [19].

Concerning the program duration, 11 studies examined one season [8][9][13][17][14][15][20][16][24][22][23]; Gil-Arias, Harvey, Cárceles, Práxedes, and Del Villar [21] investigated two seasons; Wallhead, Garn, and Vidoni [18] investigated four seasons; and Choi, Sum, Leung, Wallhead, Morgan, Milton, Ha, and Sit [19] investigated seven seasons. The season length ranged from 8 to 25 lessons, lasting from 5 to 16 weeks. The lesson frequency ranged from one to three lessons per week. The lessons were mostly 40–60 min long, although some programs used a double-lesson format of 90 min [19].

The sport education programs were frequently delivered by one to three teachers with teaching experience. The majority of teachers had more than five years of teaching experience. However, only less than half of them had prior teaching experience in sports education.

Thirteen studies (93%) reported a significant relationship between the SEM and students' motivation (Table 1). Higher autonomy and more enjoyment toward PE sessions were associated with the SEM. Furthermore, the SEM promoted an inclusive PE learning environment [15][23] and showed that students became more interested than direct instruction or the traditional education model [16][21].

**Table 1.** Study characteristics and main findings.

Source	Country	Study Design, Sample Characteristics (n, Sex, Age), Recruitment	Sport Education Model Experience	Data Assessment (Instruments to Assess Motivation)	Main Findings
Burgueño, Medina-Casaubón, Morales-Ortiz, Cueto-Martín and Sánchez-Gallardo [24]	Spain	Quasi-experimental study. Pre-and post-test measures and intra- and inter-group analysis. 44 high school students (22 boys, $M_{age} = 16.32 \pm 0.57$ ).	Following the structural guidelines of the SEM established by Siedentop et al. (2011) for 12 sessions of basketball teaching.	Situational Motivation Scale.	The SEM significantly improved the level of intrinsic motivation and identified regulation about TEM. SE has significantly reduced external regulation and amotivation in students regarding TTM.
Burgueño, Cueto-Martín, Morales-Ortiz and Medina-Casaubón [14]	Spain	Pre-experimental pre-/post-test design. 75 high school students (38 boys, $M_{age} = 16.75 \pm 0.87$ ).	The intervention programme under SE conditions included 3 classes, twelve 50-min lessons each, twice per week in regular PE schedule. Based on the preference of the three PE teachers, indoor soccer, volleyball and basketball were taught.	Perceived Locus of Causality Scale. Achievement Goal Questionnaire-Physical Education (Spanish version). Social Goal Scale Physical Education (Spanish version).	The SEM was a pedagogical model that favours the adequate motivational response of high school students in terms of self-determination, motivational achievement, and social motivation in the sports teaching-learning process in PE classes.
Chenchen, Rong and Shuaijing [16]	China	Study with nonequivalent pre-test-post-test. Two groups: IG (the SEM group) n = 36 and CG (traditional sport Model) n = 28; Aged 16–17 years old from a senior high school in China.	Students participated in one lesson per week for 16 weeks in a semester, and each lesson should last for 40 min of table tennis classes taught following the SEM.	Questionnaire of student's attitude and interviews.	The learning attitudes of students in SE class including cognitive, emotional, and behaviour disposition improved significantly after the season.

Source	Country	Study Design, Sample Characteristics (n, Sex, Age), Recruitment	Sport Education Model Experience	Data Assessment (Instruments to Assess Motivation)	Main Findings
Choi, Sum, Leung, Wallhead, Morgan, Milton, Ha and Sit <sup>[19]</sup>	China, Hong Kong	A Cluster-randomised study design. 372 participants. Two groups: IG (the SEM group) n = 188 and CG n = 184. M <sub>age</sub> 18.5 years. 95% of the study sample were Chinese. 70% of the study sample were male.	SE seasons were designed for badminton, basketball, football handball, physical conditioning, swimming, and volleyball. Each SE season included ten 90-min lessons, 1-day per week.	Situational Motivation Scale (SIMS). Physical activity enjoyment scale (PACES). Empowering and disempowering motivational climate questionnaire in PE (EDMCQ—PE).	The SE group presented higher scores in the internalised regulations of intrinsic and identified regulation motivations. They also had lower scores in external and amotive regulations.
Cuevas, García-López and Serra-Olivares <sup>[20]</sup>	Spain	Quasi-experimental design. Two groups: IG (the SEM group) n = 43; and CG (traditional PE lessons) n = 43. 86 PE students (49 girls) between 15 and 17 years of age (M <sub>age</sub> = 15.65; SD = 0.78).	The teaching unit on volleyball consisted of 19 55-min sessions (two/week in the regular PE schedule) structured based on the SEM.	Questionnaire for Evaluating Motivation in Physical Education (CMEF). Sport Satisfaction Instrument (SSI). Intention to be Physically Active Scale (IPAS).	The results showed improvements in intrinsic motivation in the SEM intervention group.
García-González, Abós, Diloy-Peña, Gil-Arias and Sevil-Serrano <sup>[15]</sup>	Spain	Pre-experimental pre-/post-test design. A final sample of 49 students, M <sub>age</sub> = 15.5 ± 0.57, 49% female from secondary education level.	A hybrid SE/TGfU volleyball teaching unit was applied twice per week over five weeks (10 lessons of 50 min).	The Basic Psychological Needs Support Questionnaire in PE. Basic Psychological Need in Exercise Scale (BPNES). Novelty Need Satisfaction Scale (NNSS). Perceived Variety in Exercise questionnaire (PVE).	This hybrid SE/TGfU could improve the students' motivation during the PE classes, particularly those who showed an early low or moderate self-determined motivation at the beginning of the intervention. This model could bring more positive experiences to the students and be more inclusive.
Gil-Arias, Harvey, Cárceles, Práxedes and Del Villar <sup>[21]</sup>	Spain	A crossover design was utilised, using the technique of counterbalancing. 55 students (M <sub>age</sub> = 15.45 ± 0.41, min. 27 females from Secondary Education school.	The intervention was conducted over eight weeks (two months) for a total of 16 lessons and focused on the team sports of volleyball and ultimate frisbee. One group experienced a hybrid SE/TGfU unit, followed by a unit of direct instruction. A second group had the units in the opposite order.	Perceived Locus of Causality. Basic Psychological Needs in Exercise Scale. Enjoyment in Sport Scale. The intention to be physically active scale was administered to participants.	A hybrid model of TGfU/SE stimulated increases in autonomy, relatedness, competence, autonomous motivation, enjoyment, and intention to be more active compared to direct instruction.
Gil-Arias, Harvey, García-Herreros, González-Víllora, Práxedes and Moreno <sup>[23]</sup>	Spain	Pre-intervention/post-intervention quasi-experimental design. IG (the SEM group) n = 148; M <sub>age</sub> = 10.39 ± 0.48, 71 females; G (direct instruction) n = 144; M <sub>age</sub> = 10.43 ± 0.49, 69 females. Students were in their fifth year of elementary school	A hybrid SE/TGfU basketball teaching unit was conducted during 16 lessons (8 weeks), 50 min twice a week.	Perceived Locus of Causality Questionnaire. PA Class Satisfaction Questionnaire. Autonomy-Supportive Coaching Strategies Questionnaire. BPNs in exercise scale. Relationship goals questionnaire-friendship version.	A hybrid TGfU/SE unit encouraged an autonomy-supportive, inclusive, and equitable PE learning environment. All students have chances to increase their commitment, enjoyment, and social interactions within PE lessons.

Source	Country	Study Design, Sample Characteristics (n, Sex, Age), Recruitment	Sport Education Model Experience	Data Assessment (Instruments to Assess Motivation)	Main Findings
Kao and Luo <sup>[9]</sup>	Taiwan, China	Quasi-experimental design. IG (the SEM group) n = 59; M <sub>age</sub> = 21.42 ± 0.75, 32 men; CG (direct instruction) n = 56; M <sub>age</sub> = 21.38 ± 0.73, 29 men.	A SE-based badminton teaching unit was conducted over 10 weeks.	Elective Motivation Scale of Physical Education Curriculum (EMSPEC).	Students' elective motivation toward PE improved and was higher than those who received direct instruction. The SEM also increased the elective motivation of low-performing students.
Medina-Casabón and Burgueño <sup>[22]</sup>	Spain	Quasi-experimental design. 44 students (22 girls, M <sub>age</sub> 16.32 ± 0.57). IG (the SEM group) n = 22; CG (traditional teaching group) n = 22.	A SE basketball teaching unit was conducted for 12 lessons of 55 min.	The Questionnaire to Support Basic Psychological Needs in Physical Education.	the SEM improved the perceived level of autonomy support and structure in the inter-group analysis and the intra-group.
Méndez-Giménez, Fernández-Río and Méndez-Alonso <sup>[8]</sup>	Spain	Quasi-experimental design with three levels of treatment: (1) Traditional model = 110, (3) SE- with conventional resources: N = 107, and (3) SE- with self-made materials: N = 78. In total 295 students (159 males), M <sub>age</sub> = 14.2 ± 1.68. Participants belonged to different class groups from 7th to 11th grade	A SE Ultimate-Frisbee learning unit of 12 sessions of 50 min each. Two SE approaches were considered: (1) SE with conventional resources and (2) SE with self-made materials.	Achievement Goal Questionnaire-Physical Education (AGQ-PE). Friendship Goals in Physical Education Questionnaire. Basic Psychological Needs in Exercise Scale (BPNES).	Both the SEM groups reported improvements over time in autonomy, competence, and relatedness to others, versus the only improvement in autonomy in the traditional model. The SEM was shown to be more effective than the traditional method at the motivational and attitudinal levels.
Puente-Maxera, Méndez-Giménez and de Oieda <sup>[13]</sup>	Spain	Quasi-experimental, pre-test, and post-test measures study. 36 students (17 women; mean age 11.36 ± 0.59). Participants belonged to elementary school	A SE handball teaching unit of 10 sessions of 60 min each.	Motivation Orientation (GOES). Climate Motivation (CMI). Basic Psychological needs satisfaction (EMMD). Interviews.	the SEM produced an oriented climate to the task. Dynamic roles were shown as a powerful methodological strategy for students' motivation.
Wallhead and Ntoumanis <sup>[17]</sup>	England	Non-equivalent control group (IG (the SEM) n = 25; CG= (traditional teaching approach), n = 26. In total, 51 boys (46 Caucasians and 5 Asian descent; M <sub>age</sub> 14.3 ± 0.48).	8-week intervention of SE basketball teaching unit.	Enjoyment, Effort, and Perceived Competence (IMI). Achievement goal orientations (TEOSQ). Perceived Autonomy (ASRQ). Perceptions of motivational climate (LAPOPECQ).	Students in the SEM had significantly higher post-intervention enjoyment and perceived effort than those taught with the traditional PE approach.
Wallhead, Garn and Vidoni <sup>[18]</sup>	United States, Midwestern	Non-equivalent control-group design (IG = the SEM approach; CG = multi-activity model of instruction). 568 students from 2 high schools (310 girls; M <sub>age</sub> 14.75 ± 0.48; ethnic minority students 20%-30%).	Four 25-lesson seasons of floor hockey, volleyball, team handball, and basketball were taught using the SE approach.	Perceived Locus of Causality Questionnaire (PLCQ). Academic Motivation Scale (AMS). Intrinsic Motivation Inventory (IMI).	The SEM group reported greater increases in perceived effort and enjoyment of the program than the students taught within the multi-activity model. Those positive affective outcomes were enabled by the development of more autonomous forms of motivation.

Abbreviation: ACQ-PE, Achievement Goal Questionnaire-Physical Education; AMS, Academic Motivation Scale; ASRQ, Academic Self-Regulation Questionnaire; BPNES, Basic Psychological Needs in Exercise Scale; CBAS, Coach Behavior Assessment System; CG, control group; CMI, Escala de Percépcion del Clima Motivacional de los Iguales; EMMD, Escala de los Mediadores Motivaciones en el Deporte; EMPSEC, Elective Motivation Scale of Physical Education Curriculum; GOES, Escala de las Orientaciones de Meta en el Ejercicio; IMI, Intrinsic Motivation Inventory; LAPOPECQ, Learning and Performance Orientations in Physical Educations Classes Questionnaire;  $M_{age}$ , mean age; PA, physical activity; PE, Physical Education; SD, standard deviation; SE, sport education; the SEM, Sport Education Model; TEM, Traditional Education Model; TEOSQ—Task and Ego Orientation in Sport Questionnaire; TGfU, Teaching Games for Understanding; TSM, Traditional Sports Model.

### 3. Conclusions

This review shows that the SEM offers a large range of opportunities for students to develop more self-determined motivated behaviour in PE class with high levels of responsibility and engagement. In this aspect, the SEM can be considered a useful methodological instrument to change the current trend of declines in motivation and participation in PA by adequately implementing the SEM in PE classes.

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