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SPORT EDUCATION

Cultivating College Students' Motivation in Physical Education Through Sport Education Model in COVID-19 Era: A Prospective Cohort Study

Longxi Li, Michael Louis, Michelle E. Moosbrugger

Abstract

This study aimed to investigate the effectiveness of implementing the Sport Education Model on college students' well-being and motivation in physical education (PE) during the COVID-19 pandemic. Healthy college students (49.8% female; 50.2% male; N = 255; M_{age} = 18.87 ± 0.92 years) were recruited from two waves of data collection. The experimental group (n = 130) was enrolled in courses that implemented the Sport Education model. Comparisons were made to the control group (n = 125), which was enrolled in courses with direct instruction. Both groups engaged in a 15-week face-to-face intervention. Student motivation, goal orientation, perceived climate, self-efficacy in exercise, perceived stress, and psychological distress were measured through an omnibus electronic questionnaire at pre- and posttest. A series of 2 (group) × 2 (time) mixed factorial multivariate analyses of variance and analyses of variance with follow-up post hoc analysis demonstrated small-to-moderate effects for the intervention. Intrinsic motivation (interest enjoyment and effort importance), task orientation, and task-involving climate significantly increased from pre- to posttest in the Sport Education group. Mental wellness improved, and psychological

Longxi Li, Center for Leadership in Athletics, University of Washington. Michael Louis, Department of Physical Education, Springfield College. Michelle E. Moosbrugger, Physical Education and Health Education Department, Springfield College. Please send author correspondence to mmoosbrugger@springfieldcollege.edu

distress symptoms and perceived stress decreased significantly from pre- to posttest for both groups. The findings demonstrate the effectiveness of implementing Sport Education in creating a student-centered, task-involving climate and cultivating college students' motivation in PE. Engaging in face-to-face PE sessions is likely to improve college students' well-being in COVID-19 era.

Accumulating evidence shows that students transitioning into higher education are at risk due to significant declines in physical activity (PA) participation (Centers for Disease Control and Prevention, 2016) and motivation in physical education (PE; Mowling et al., 2004) and increases in sedentary behavior (Calestine et al., 2017) and screen time (Wu et al., 2015). The current issue facing physical educators is how to motivate students for PA through PE. Sport Education is an instructional model that aims to provide positive motivational climates and emphasize student-centered learning (Metzler, 2017; Siedentop et al., 2019). Research support for the Sport Education model is encouraging; however, effects on college student motivation and the motivational climate are not well understood. Particularly during the COVID-19 era, college students are experiencing a sense of social isolation, lack of motivation in PA, and increased mental health issues, leading to burnout (Li et al., 2021). The aim of this study is to investigate the effectiveness of Sport Education on college students' motivation, self-efficacy in PE, and well-being during the COVID-19 pandemic.

Sport Education as Playful Competitions

As specified by Siedentop (1980), PA and PE can facilitate achievement of physical, social, moral, and mental goals. Aligning with his philosophical standpoint, the primary focus of Sport Education is "to educate students to be players in the fullest sense and to help them develop as competent, literate and enthusiastic sportspeople" (Siedentop, 2002, p. 4). The underpinning of Sport Education is play theory or play education with sport as a form of play and a process of how people come to learn and participate in the physical culture (Siedentop & van der Mars, 2012). According to Siedentop et al. (2019), as "an institutional form of play," sport is highly structured governance with a set of rules to ensure fair and playful competitions (p. 14). Authentic sport experience is the

heart of Sport Education, which also takes seriously the need to help students understand and appreciate the rituals and conventions of various activities and to understand the differences between good and bad sport practices (Siedentop et al., 2019). Playful competitions are strengthened through developing and sustaining small diverse learning groups, also known as teams in Sport Education. Students take various roles and responsibilities to contribute to the team success. According to Cohen and Lotan (2014), delegating authority empowers students to be responsible for specific parts of their work; an attractive feature of Sport Education is the autonomy given to students. Because all competitions in Sport Education are among teams, "this pursuit of competence provides motivation for all students and can enhance learning and self-esteem" (Siedentop et al., 2019, p. 15). The cooperative learning environment in Sport Education also favors students' personal and social development as contributing to the ultimate goal of developing literate, enthusiastic sportspersons. When students have positive sport experiences in Sport Education, they may extend their participation and engagement from PE to a future self-determined physically active and healthy lifestyle.

Sport Education and Motivation

Motivation in PE is pivotal to furthering student learning outcomes and promoting out-of-school exercise (Tomczak et al., 2020). According to Deci and Ryan (1985), the infrastructure of self-determination theory (SDT) is associated with motivational mechanisms that individuals use while participating in PA. The theory can underpin Sport Education, which aims to empower students with achievement goals in motivational environments. The positive impact of Sport Education is evident in studies on motivation and positive development of school-aged youth (see Cuevas et al., 2016). Support for basic psychological necessities (competence, autonomy, and relatedness) encourages more self-determined levels of motivation, especially intrinsic motivation (Cuevas et al., 2016; Romar et al., 2018). Hence provision of a playful and motivational climate where students' stated needs are supported reinforces their self-determined behavior in Sport Education sessions. Observable correlations exist between the goal orientation component and the intrinsic motivation component of Sport Education (Tomczak et al., 2020). Using different dimensions of motivation to focus on underlying motivations for

an individual's behavior, "an ego orientation represents an internally controlling state that can undermine intrinsic motivation, whereas a task goal orientation represents a state in which individuals derive pleasure from participation," which facilitates intrinsic motivation (Chin et al., 2012, p. 152). Briefly, task orientation encourages intrinsic drive, whereas ego orientation encourages extrinsic motivation.

In addition, individuals' motivation can be influenced considerably by the motivational climate (Weinberg & Gould, 2003). A task-involving climate is an environment perceived to involve positive reinforcement of effort, improvement, and cooperation; an ego-involving climate is an environment perceived to reinforce social comparison, competition, and punishment for mistakes (Newton et al., 2000). Research assessing the relationship between goal orientations and motivational climate in collegiate PE is limited, but initial research suggests that the perceived motivational climate influences goal orientations, with a mastery climate leading to a task orientation and a performance climate leading to an ego orientation (Gencer & Öztürk, 2018). Therefore, it is necessary to assess students' intrinsic motivation, goal orientations, and motivational climate in Sport Education not only as separate constructs but also as interdependent variables.

Sport Education in The Present Study

This study presents novel features not found in prior studies. Noteworthy, studies analyzing motivation and goal climate related to Sport Education are extensive in K–12 education. Studies with a focus on student perceptions and motivations in PE with adequate sample size and a rigorous study design can fill the gap in the literature and provide more knowledge on implementing Sport Education in college environment. This study replicates and extends much of the Spittle and Byrne (2009) study by utilizing a 15-week intervention and examining the Sport Education model's influence on other closely related psychological factors, such as exercise self-efficacy. In addition, with the global COVID-19 pandemic, college students experience social isolation, life pressure, and high-intensity online learning and thus severe mental health consequences (Li et al., 2021). Because a foundational purpose of PE is to educate the whole person with improved physical and mental wellness, we measure students' well-being and aim to provide strategies to this serious social issue

from the perspective of PE. Along this line of consideration, to further explore Sport Education in a college context, the purpose of this study is to investigate the effectiveness of implementing the model on students' motivation, exercise self-efficacy, and well-being in the COVID-19 era.

Three hypotheses are proposed: First, students would, after the intervention, experience improvements in intrinsic motivation (interest enjoyment, perceived competence, and effort importance), task orientation, and the task-involving motivational climate, combined with reductions in tension pressure, ego orientation, and ego-involving motivational climate; second, students were expected to have increased exercise self-efficacy; and third, these students would exhibit less psychological distress symptoms and lower perceived stress in a Sport Education condition than in a Direct Instruction condition.

Method

Participants

A 4-year coeducational university in the Northeastern United States was selected as the research site. Participants of study were healthy college students (N = 255, M_{age} = 18.87, SD_{age} = .92) who enrolled in wellness and physical literacy or PE courses. The Sport Education model implemented units (experimental group) included net/wall games (45.7%) and invasion games (54.3%); Direct Instruction units (control group) included net/wall games (12.1%), track & field (3.1%), target games (10.3%), striking games (11.6%), and fundamental level exploring wellness through movement (65.9%). The courses were part of the instructional program for the general student population; students selected the courses to satisfy general education requirements. A prospective cohort study, with a quasi-experimental design, was implemented, in which experimental and control group were repeatedly measured before and after the intervention (Caruana et al., 2015). Intact sampling was employed; intact groups consisted of 25 students who registered for the same course. Validity of results from was determined by the process by which the group was formed (Schoonenboom, 2016). Participants were blinded on which instructional model would be implemented before pretest. Participants who dropped out or did not complete the

questionnaire at posttest thus were not included in the analysis (the recruitment process is attached in Appendix A). Given that initial group size and participant characteristics were critical to a rigorous design, we screened the data, and essentially equal sample sizes, gender, and ethnicity were demonstrated across groups (Table 1). After ethical approval was obtained from the college Institutional Review Board (IRB), participants electronically signed informed consent immediately before enrollment in the study.

Table 1
Participant Characteristics Listed by Group (N = 255)

	Condition				
Characteristic	**Experimental**	**Control**	***t*/χ^2**	***df***	***p***
Gender (female/male)	66/64	61/64	0.10	1	.75
Ethnicity [a]	-	-	8.70	4	.07
Student athlete (SA/NSA)	55/75	56/69	0.16	1	.69
Age, year (*M* ± *SD*)	18.67 ± 0.63	19.07 ± 1.11	3.50	253	< .001
Exercise/day, hr (*M* ± *SD*)	1.61 ± 1.14	1.59 ± 1.04	0.86	253	.39

Note. SA = self-reported as a student athlete; NSA = self-reported as a non-student athlete.

[a] Ethnicity was determined via self-report including (%) African American (5.9), Asian/Pacific Islander (4.3), Caucasian/White (82.4), Latino (6.3), Prefer not to Respond (1.2) across Sport Education Model (Experimental) and Direct Instruction (Control) groups.

Procedure

Two waves of data collection were conducted in Spring (January–May) and Fall (September–December) semesters 2021. Participants completed the pretest measures at the first week of the semester. Electronic questionnaires were generated on Qualtrics (Seattle, WA: Qualtrics International), enabling paperless data collection, minimizing the cross-contact risk in COVID-19. Instructors who enrolled in this study were provided a quick response (QR) code a week before the semesters began. Accordingly, instructors assigned 15 to 20 min in a session; students scanned the code and completed the psychometric battery individually on their own mobile devices (cell phone, tablets, etc.). The posttest measures were completed in

the last academic week via the same format in each condition. In addition to time, the second grouping variable was condition.

Conditions

The Sport Education condition (experimental) was compared with a traditional teacher-led instruction (control), also known as Direct Instruction (Metzler, 2017). We did not assign the instructors and ensured the fidelity of implementation of the pedagogical models in two ways. First, instructors were trained in a pre-semester, 1-day workshop with a focus on effectively implementing instructional models in their sessions, and second, learning objectives and student outcomes were predetermined at the department level and were consistent across all Sport Education vis-à-vis the Direct Instruction sessions. Instructors had an average of 3 years of prior experience teaching in PE and health education; those implementing Sport Education had taken coursework on the model at the undergraduate or graduate level and had access to Sport Education resources.

Sport Education

Participants in the experimental group were exposed to a 15-week face-to-face teaching format that consisted of either two 75-min or three 50-min sessions per week. Sport Education sessions were designed on the basis of Siedentop et al.'s (2019) six distinctive features: seasons, affiliation, formal competition, record keeping, festivity, and a culminating event. Sessions followed a three-phase format. The initial phase (Week 1–3) was largely teacher directed with skill assessment and development used for presenting the model, selecting roles, and introducing and developing fundamental sport skills. Instructors decided on the number of teams that would participate in the Sport Education season and the students were then asked to nominate a selection panel. Combining with skill assessment, the student selection panel and the instructor then selected and matched mixed-ability teams. Within teams, students selected individuals to undertake certain roles, such as captain, coach, player, referee, and journalist. In the second phase (Week 4–7), teams conducted warm-up games, skill drills, and team-led practice. Within each team, students gained hands-on experiences and deeper understanding of their role responsibilities and closely collaborated with teammates in preparation for the next phase. Largely student-led,

teams explored and planned for integration of physical and intellectual wellness practices to improve individual performance, tactical knowledge, and team interactions. The final phase (a week before midterm) included a festive event. Students served in various roles in the competition and celebration of a championship. In the second half of the semester, the whole class switched to a second student-selected sport within the identified game category; the same procedure was followed as in the previous season.

Control Condition

The control group engaged in Direct Instruction sessions in which the teacher acted as "the sole instructional leader who [took] all the decisions on content development, class management and student engagement patterns" (Pereira et al., 2016, p. 569). Identically, the control group participated in the 15-week face-to-face teaching format that consisted of either two 75-min or three 50-min sessions per week. Weekly format included content delivery, movement application, and assessment via individual and group reflection. Following the conventions of the Direct Instruction model, instructors were neither implementing Sport Education nor other instructional models in the class, which was organized as teacher-directed PE sessions throughout the semester. Instructors applied whole-group instruction. Students were neither selecting nor responsible for roles such as coach and player.

Measures

At pre- and posttest, participants' general demographic information, intrinsic motivation, goal orientations, perceived motivational climate, exercise self-efficacy, and well-being were collected through validated psychological instruments.

Intrinsic Motivation

Intrinsic motivation for sport and PE was measured via the 18-Item Intrinsic Motivation Inventory (IMI; McAuley et al., 1989), a scale widely tested in use with adolescents in PE (Goudas & Biddle, 1994). Considering there was more than one sport implemented across groups, instead of one specific sport (e.g., basketball, volleyball, tennis), items were reworded with the word "sport" with a highlight in the directions that "sport in the following statements

refer in particular to the sport[s] in your PE session". Four underlying dimensions of intrinsic motivation consisted of "I enjoyed this class very much" (interest enjoyment), "I am satisfied with my performance at this sport" (perceived competence), "I put a lot of effort into this class" (effort importance), and "I felt tense while playing the game" (pressure tension). Participants responded on a 5-point Likert scale from 1 (*very strongly disagree*) to 5 (*very strongly agree*). The negatively worded questions ($n = 4$) were reverse scored.

Goal Orientations

Goal orientations were assessed via the 13-item, two-factor Task and Ego Orientation in Sport Questionnaire (TEOSQ), which showed adequate validity and reliability in previous studies (Magyar et al., 2004). Participants were requested to think of their individual experience in their PE sessions. Two subscales consist of seven task-related and six ego-related items reflecting the definitions of success in the class. For example, "I feel most successful in sport when I learn something that is fun to do" (task orientation) and "I feel really successful in this PE session when the others can't do as well as me" (ego orientation). Participants indicated their degree of agreement on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

Perceived Motivational Climate

The Perceived Motivational Climate Questionnaire in Sport-2 (PMCSQ-2) was used in the assessment of students' perception of motivational climate in the PE sessions (Newton et al., 2000). The 33-item PMCSQ-2 consisted of two higher-order scales (task- and ego-oriented climates) showed acceptable validity and reliability (Zurita Ortega et al., 2018). Participants were asked to think about what it was like participating in their PE session. For example, in this PE class, "students are encouraged to work on their weaknesses" (task-involving climate) and "students are encouraged to outplay the other students" (ego-involving climate). Participants rated the climate on a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*).

Exercise Self-Efficacy

The 18-item Exercise Self-Efficacy Scale (ESS; Bandura, 1997) was originally developed to assess belief in a person's ability to continue exercising. Participants thought about several situations in which it

could be difficult to adhere to an exercise routine and scored how certain they were to perform their daily exercise routine regularly. Situations can be categorized into three subscales: situational/interpersonal factor (e.g., "when there are other interesting things to do"), competing demands (e.g., "if I don't reach my exercise goals"), and internal feeling (e.g., "when I am feeling anxious"). Each item had a 100-point percentage scale (10-point increments), ranging from 0% (*cannot do at all*) to 100% (*highly certain can do*). Overall, in IMI, TEOSQ, PMCSQ-2, and ESS, total strength for each subscale was then calculated via a sum of the ratings divided by the total number of items in the subscale.

General Health

The 12-item General Health Questionnaire (GHQ-12) was used in the assessment of psychological distress or the severity of a mental problem over the past few weeks (Hankins, 2008). On a 4-point Likert-type scale, from 0 (*never*) to 3 (*always*), a total score ranging from 0 to 36 was commonly reported and calculated via addition of each item together. There are three subscales: social dysfunction (e.g., "felt constantly under strain"), anxiety (e.g., "feeling unhappy and depressed"), and loss of confidence (e.g., "thinking of self as worthless"). The positively worded questions (n = 6) were reverse scored. The higher overall score indicated worse mental health.

Perceived Stress

The 10-item Perceived Stress Scale (PSS), a global stress assessment instrument (Cohen et al., 1983) with ten 5-point Likert-type questions on a scale from 0 (*never*) to 4 (*always*), was used in the measurement of the perception of experienced stress by the participants over the past month (AlAteeq et al., 2020). The PSS was validated empirically mostly in college populations (Lee, 2012). Participants were asked about their feelings and thoughts in the last month (e.g., "How often have you felt that you were unable to control the important things in your life?"). Positively stated items scores (n = 4) were obtained via reverse responses and then a sum across all scale items. Scores ranging from 0–13, 14–26, 27–40 were considered as low, moderate, and high perceived stress, respectively.

Data Analysis

A priori power analysis was implemented on the statistical program G-Power 3.1 and through this the minimum number of participants (N = 128) determined, with the assumptions of moderate effect and 80% of power (Faul et al., 2007). Data were analyzed by four 2 (condition) × 2 (time) mixed-factorial multivariate analyses of variance (MANOVAs) for subscales of IMI, TEOSQ, PMCSQ-2, and ESS, respectively, and two univariate analyses of variance (ANOVAs) for the overall score of GHQ-12 and PSS, respectively. In line with the previous studies with a similar design, follow-up univariate mixed-factorial ANOVAs were conducted as the post hoc analysis for further examining significant effects and testing the hypothesis (Mosewich et al., 2013). Significant interactions were followed up with a simple effect test for examination of differences between conditions at tests; main effect was examined via comparison of mean differences if no significant interaction was detected. The effect sizes were also determined in MANOVAs and ANOVAs via partial eta squared (η_p^2), interpretation as small ($\eta_p^2 < 0.01$), medium ($\eta_p^2 = 0.022–0.059$), and large ($\eta_p^2 > 0.083$); Cohen's d was reported in estimating of the magnitude of the difference between the two means, interpretation as small ($d = 0.2$), medium ($d = 0.5$), and large ($d = 0.8$) on the basis of benchmarks from Cohen (1988). Outliers were identified and removed with a Z score either greater than 3.29 or smaller than -3.29. Alpha level was set at .05. Date analysis was performed via IBM-SPSS software (version 28.0; Armonk, NY: IBM Corp).

Results

A priori data screening ensured that missing data and outliers were removed and basic assumptions including univariate and/or multivariate normality, homogeneity of variance, intercorrelation were assumed. All instruments showed the acceptable-to-excellent internal consistency with Cronbach's alpha ranging from .71 to .96. Table 2 provides a summary of the descriptive and inferential statistics (Appendices B & C show line graphs).

Table 2

Means and Standard Deviations for Sport Motivation, Motivational Climate, Self-Efficacy in Physical Education, and Well-Being in COVID-19 for the Sport Education (Experimental) and Direct Instruction (Control) Groups (N = 255)

	Pretest			Posttest				
Variable and group	**M**	***SD***	***α***	***M***	***SD***	***α***	***p***	η_p^2
Intrinsic motivation								
Interest enjoyment								
Experimental	2.00	0.65	.80	2.11	0.72	.82	.013	0.024
Control	1.90	0.61		1.77	0.69			
Perceived competence								
Experimental	2.14	0.70	.82	2.06	0.64	.79	.926	0.000
Control	2.01	0.68		1.92	0.66			
Effort importance								
Experimental	1.79	0.64	.73	2.09	0.72	.74	.019	0.022
Control	1.80	0.59		1.86	0.68			
Tension pressure								
Experimental	3.66	0.85	.74	3.60	0.82	.71	.123	0.009
Control	3.60	0.87		3.77	0.86			
Goal orientation								
Task orientation								
Experimental	1.58	0.59	.95	1.82	0.69	.95	.010	0.026
Control	1.64	0.65		1.60	0.63			
Ego orientation								
Experimental	2.66	0.93	.92	2.75	0.99	.93	.390	0.003
Control	2.71	0.95		2.67	0.97			
Perceived motivational climate								
Task-involving climate								
Experimental	3.81	0.99	.96	4.15	0.88	.96	.035	0.018
Control	3.83	0.93		3.86	0.96			
Ego-involving climate								
Experimental	1.88	0.67	.95	1.98	0.68	.95	.309	0.004
Control	1.61	0.56		1.61	0.61			

Table 2 (cont.)

	Pretest			Posttest				
Variable and group	**M**	***SD***	***α***	***M***	***SD***	***α***	***p***	η_p^2
Exercise self-efficacy								
Situational/interpersonal								
Experimental	59.21	19.54	.86	60.97	21.82	.90	.340	0.004
Control	61.23	20.17		60.10	20.87			
Competing demands								
Experimental	58.52	19.56	.85	60.16	20.56	.89	.090	0.011
Control	61.77	19.01		58.01	20.55			
Internal feelings								
Experimental	62.43	20.81	.90	57.75	20.39	.89	.241	0.005
Control	60.69	21.60		59.71	21.50			
Psychological distress								
Experimental	2.23	0.38	.72	2.10	0.51	.85	.139	0.009
Control	2.17	0.40		2.15	0.51			
Perceived stress								
Experimental	28.08	6.66	.82	25.74	7.02	.82	.208	0.006
Control	28.32	6.94		27.51	6.86			

Note. The *p* value refers to post hoc univariate ANOVAs on the Test × Condition interaction in subscales.The partial eta squared is the effect size of post hoc univariate ANOVAs. GHQ-12 and PSS were reported as sum across all scale items.

Changes in Intrinsic Motivation

Significant mean vectors were found between the experimental group and the control group across the four subscales in IMI: interest enjoyment, perceived competence, effort importance, and tension pressure, Wilks's $\Lambda = .947$, $F(4, 250) = 3.48$, $p = .009$, with a medium effect size, $\eta_p^2 = .053$. In the follow-up post hoc analysis, significant interactions were found in interest enjoyment, $F(1, 253) = 6.33$, $p = .013$, $\eta_p^2 = .024$, effort importance across groups, $F(1, 253) = 5.57$, $p = .019$, with a medium effect size, $\eta_p^2 = .022$. In the simple effect tests, the experimental group ($M = 2.11$, $SD = 0.72$) had a significantly higher interest enjoyment than the control ($M = 1.77$, $SD = 0.69$) at posttest, $t(253) = 3.94$, $p < .001$, with a small to medium effect

size, d = 0.48. The experimental group (M = 2.09, SD = 0.72) had a significantly higher effort importance than the control (M = 1.86, SD = 0.68) at posttest, $t(253) = 2.62$, p = .01, with a small to medium effect size, d = 0.33. No significant interaction and main effect were found between the experimental group and the control group at pre- and posttest in perceived competence and tension pressure (ps > .05).

Changes in Goal Orientations

Significant mean vectors were found between the experimental group and the control group across two subscales in TEOSQ: task orientation and ego orientation, Wilks's Λ = .973, $F(2, 250) = 3.45$, p = .033, with a medium effect size, η_p^2 = .027. In the post hoc analysis, significant interactions were found in task orientation across groups, $F(1, 253) = 6.79$, p = .01, with a medium effect size, η_p^2 = .026. In the simple effect test, the experimental group (M = 1.82, SD = 0.69) had a significantly higher task orientation than the control (M = 1.60, SD = 0.63) at posttest, $t(253) = 2.72$, p = .007, with a small to medium effect size, d = 0.33. No significant interaction and main effect were found between the experimental group and the control group at pre- and posttest with response to ego climate (ps > .05).

Changes in Motivational Climate

No significant mean vectors were found between the experimental group and the control group across two subscales in PMCSQ-2: task-involving climate and ego-involving climate, Wilks's Λ = .979, $F(2, 250) = 3.45$, p = .066, with a small effect size, η_p^2 = .021. In the post hoc analysis, significant interactions were found in task-involving climate across groups, $F(1, 253) = 3.06$, p = .035, with a small effect size, η_p^2 = .018. In the simple effect test, the experimental group (M = 4.15, SD = 0.88) had a significantly higher task climate than the control (M = 3.86, SD = 0.96) at posttest, $t(253) = 2.03$, p = .012, with a small to medium effect size d = 0.31. No significant interaction and main effect were found between the experimental group and the control group at pre- and posttest with response to ego climate (ps > .05).

Changes in Exercise Self-Efficacy

No significant mean vectors were found between the experimenta group and the control group across three subscales in ESS: situational/interpersonal factor, competing demands, and internal feelings, Wilks's $\Lambda = .980$, $F(3, 251) = 1.73$, $p = .16$, with a small effect size, $\eta_p^2 = .020$. In the post hoc analysis, neither significant interaction nor main effect was found across subscales (ps > .05).

Changes in Well-Being

No significant interaction was found ($p > .05$) between the experimental and the control conditions at pre and posttest with response to well-being; participants scored significantly lower psychological distress symptoms at posttest ($M = 26.42$, $SD = 4.66$) than pretest ($M = 25.55$, $SD = 6.10$), $t(254) = -2.03$, $p = .043$, with a small effect size, $d = 0.16$. Intriguingly, a significant interaction was found between time and group with response to social dysfunction, $F(1, 253) = 5.63$, $p = .018$, with a medium effect size, $\eta_p^2 = .022$. No significant mean difference ($p > .05$) was found between tests in the control group. Participants in the experimental group had a significantly lower level of social dysfunction at posttest ($M = 2.03$, $SD = 0.51$) than pretest ($M = 2.21$, $SD = 0.53$), $t(253) = 3.19$, $p = .002$, with a small to medium effect size, $d = .36$. No significant interaction was found ($p > .05$) between the experimental and control conditions at pre and posttest with response to perceived stress; students scored significantly lower perceived stress at posttest ($M = 28.20$, $SD = 6.79$) than pretest ($M = 26.63$, $SD = 6.98$), $t(254) = -2.60$, $p = .01$, with a small to medium effect size, $d = 0.23$.

Discussion

The results of this study suggest that successful implementation of Sport Education increases student enjoyment and collaboration in class along with cultivating motivation in PE. Undergraduate students who participate in Sport Education perceive higher task-involving climate and demonstrate improvements in intrinsic motivation and task orientation in sport and PA aligning with the outcome of developing competent, literate, and enthusiastic sportspeople. With beneficial emotional effects on students' active involvement in PA and sports, Sport Education enables facilitation of motivation,

autonomy, and social interactions for college students while helping them develop teamwork and interpersonal skills of responsibility, respect, and compassion (Fraguela-Vale et al., 2020; Liang et al., 2016). With Sport Education, students experience further support of their effort and grow in competence and relatedness in a student-centered and playful class atmosphere. In this way, the college students have significant latitude in decisions, which supports autonomy (Bebeley et al., 2017; Perlman & Goc Karp, 2010; Wallhead et al., 2014). Furthermore, the necessary engagement between students throughout these activities empowers them to strengthen relatedness and sociability (Carlson & Hastie, 1997). Social learning and student empowerment may be augmented through use of the Sport Education, and it appears that if a student feels they have greater control over the perceived outcomes of a unit, intrinsic motivation may simultaneously increase.

This study also shows that students in Sport Education have more of a task orientation, which is indicative of using self/team-referenced goals on the basis of learning or task mastery. With stronger task orientation, students are more likely to select and persist at challenging tasks because they value the effort to attain new skills. A progressive task orientation represents a flow in which students derive from Sport Education pleasure that facilitates intrinsic motivation. Accordingly, individual's goal orientation can impact intrinsic motivation and likewise couple with the perceived motivational climate (Roberts, 2001; Yang & Dong, 2017). Compared to direct instruction, Sport Education more sufficiently fulfills students' basic psychological needs in a unit, which aligns with previous research (Cuevas et al., 2016). This study's results are consistent with evidence in school-aged youth (Spittle & Byrne, 2009) that students who enroll in courses with Sport Education perceive task-involving climate, develop higher task orientation toward sport, and improve intrinsic motivation. In line with Siedentop (2002), Sport Education aims to provide positive motivational sport experiences in PE, fostering the task-involving climate for students by simulating the features of authentic sport.

When students participate in Sport Education, their views of competence tend to improve (Siedentop et al., 2019; Spittle & Byrne, 2009) and their self-efficacy in exercise and PA is more likely to de-

velop (Roldan & Reina, 2021). However, although there are positive trends of perceived competence and self-efficacy, the results do not reflect similar characteristics in this study. Although self-efficacy (interpersonal/situational factor and competing demands) remotely increase for students in Sport Education, students exhibit no progress on perceived competence and internal feelings toward sport. One reasons might be the question framing, which may lead students to reflect on more general competence or self-efficacy in daily exercise routine rather than the sport(s) in which they participate within the course. On the other hand, this contradictory result might be related to social isolations and COVID-19-related restrictions (e.g., mask mandate, adapted class regulations due to safety concerns) in and outside of the PE unit. Unfortunately, since the pandemic, many college students have been living in a socially dysfunctional environment in which they are experiencing the high intensity of distance learning and a high prevalence of negative emotional conditions, which lead to PA reductions (Talapko et al., 2021). As a result, even positive emotional outcomes from Sport Education might fail to improve students' expectations in developing perceived competence and self-efficacy in certain sports.

Mental health and well-being are more and more concerning in college populations but commonly undervalued. College students experience a variety of psychological issues. Events such as the pandemic aggravate these symptoms with the proportion of depression and anxiety increasing 18% to 33%, respectively (Li et al., 2021). Encouraging signs in this study include improvements in mental wellness through participating in varying sports for 15 weeks. The result that students in both groups perceive less stress and psychological distress symptoms at the end of the semester than the beginning is promising. The results reveal that students in Sport Education group show less social dysfunction than those in the courses with direct instruction. In our perspective, PE is fostering not only an engaging environment for students to participate in regular PA but also an effective approach that connects students with their cohorts, counterbalancing the negatives of social isolations due to the COVID-19 crisis. Implementing Sport Education is evidently more effective than direct instruction in creating a socially engaged environment with students collaborating in teams and competing

and communicating with peers in the culminating event. Therefore, affiliation and formal competition as stimuli can further connect and reinforce social networks among students, which is in advanced demand now and postpandemic recovery.

Limitations

There are two major limitations in this study that provide opportunities for future research. First, the findings are limited to instructors' (n = 14) interpersonal characteristics on course delivery, even though a presemester workshop reinforces teaching skills and consistency. However, ecological validity ensures generalizability of the the results to other authentic PE settings. Second, due to convenience sampling at one study site in northeastern United States, this is a not a geographically and ethnically representative sample; hence, future studies need to conduct the intervention across contexts.

Practical Application

On the basis of the knowledge we gained from this study, we suggest the following two practical applications. According to Siedentop et al. (2019), adding festive elements is a reasonably low-cost endeavor that makes a Sport Education session more authentic and significant to students. Enhanced meaning may increase the likelihood of promoting physically active lifestyles outside the PE program. In efforts to develop an authentic sport experience, students can lead creation of these elements, with team members creating a website (e.g., Google Sites) together and posting team photos, blogs, and player portfolios. This may increase opportunities for dialogue in and out of the session, and these interactions may support well-being and festivity. It is also important that physical educators are aware not only of the positive aspects that Sport Education provides but also of the various social issues. Within the model, we recommend that teachers integrate culturally relevant pedagogy to develop student cultural competence and to assist them in developing positive ethnic and social identities as well as their ability to recognize and critique societal inequalities in a physically active context (Ladson-Billings, 2021). In future practices, students can create diverse team cultures through discussions, reflections, and events that support them to uphold their cultural identities.

Conclusion

Physical education as a key component of a healthy lifestyle is necessary for all grade-level students. Sport Education needs to be an integral part of the core curriculum in higher education. The results suggest varying promises of implementing Sport Education in a college context in terms of enhancing motivation, task orientation, and task-involving climate in PE as well as relieving stress and anxiety during the COVID-19 pandemic. Our research builds upon previous evidence; the group-level effects range from small-to-moderate and are in line with the outcomes of implementing Sport Education more in general education college PE settings. The results of this study reaffirm the importance of embedding Sport Education in college curricula to support development of perceived motor competence, tactical knowledge, and skill proficiency in sport skills and, more importantly, creating a new fountain for students to develop social connectivity. We hope that this study enables physical educators and policy makers to rethink the importance and effectiveness of Sport Education on college students' wellness and physical literary, especially for this population who are burning out and struggling during the pandemic.

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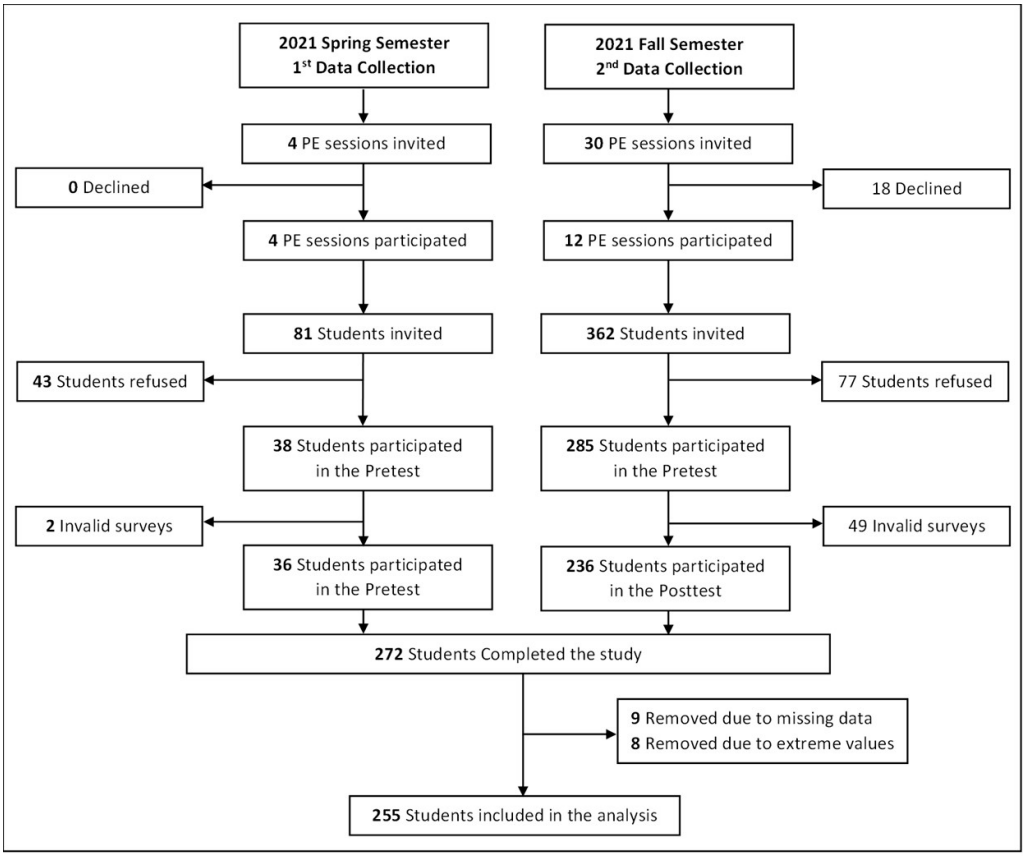
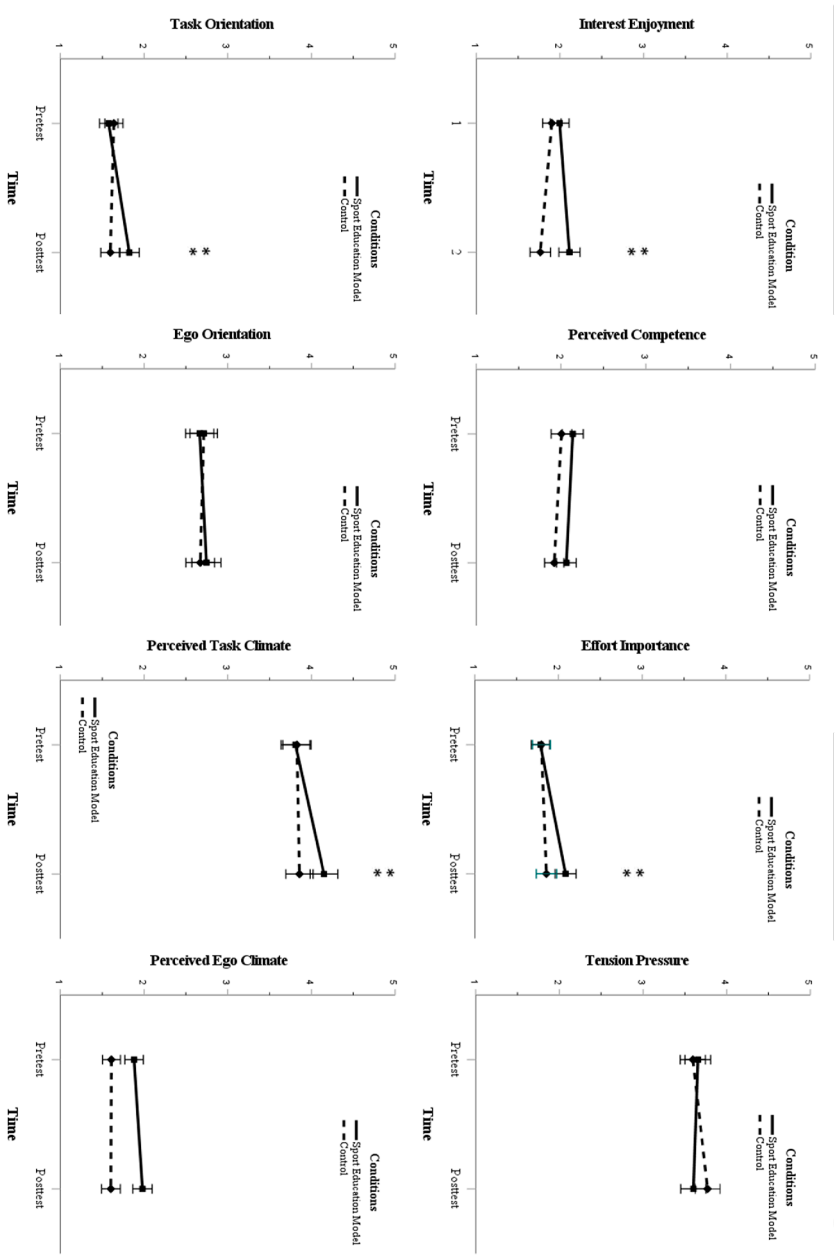
Appendix A

Recruitment Process



Appendix B

Pretest and Posttest Comparisons of Student Outcomes on Intrinsic Motivation, Goal Orientation, and Perceived Motivational Climate between Conditions



Appendix C

Pretest and Posttest Comparisons of Student Outcomes on Exercise Self-Efficacy and Well-Being between Conditions