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The effect of sport education model on self-empowerment and self-confidence

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ABSTRACT

This study aims to examine the effect of the application of two different learning models (Sport Education Model and traditional teaching model) by pre-service teachers on the students' self-empowerment and self-confidence in Physical Education classes at secondary schools. The research design was a quasi-experimental pretest-posttest. The research sample involved 429 high school students from 8 schools in Jakarta, Indonesia. The sample consisted of 220 female students and 209 male students aged between 15 to 18 years old. The instruments used were the Psychological Empowerment Instrument and the Competitive State Anxiety Inventory-2 (CSAI-2). The results show that the Sport Education Model (SEM) is able to significantly increase students' self-confidence and self-empowerment. On the other hand, the students' self-confidence and self-empowerment did not increase significantly while using the traditional teaching model. The results of this study prove that SEM gives better improvement than the traditional teaching model.

Keywords: sport education model, traditional teaching, self-confidence, self-empowerment

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INTRODUCTION

In many parts of the world, the Sport Education Model (SEM) has been researched a lot in Physical Education learning, including in Indonesia. Several universities in Indonesia having Physical Education study programs, both at the master's and doctoral levels, do a lot of research on SEM. The research findings support positive and significant results on cooperation and learning outcomes (Kurniawan & Suherman, 2015), motivation (Burstiando, 2015), physical and competitive activity (Ginanjar et al., 2019), skills (Agustan et al., 2020), leadership and performance (Slamet et al., 2021). However, regarding students' personal and social development, further empirical evidence is still needed to compare and show the impact of different curriculum models, especially regarding two important but underdeveloped variables, namely self-empowerment and self-confidence.

Previous research has compared Physical Education subjects using SEM and traditional teaching on motor and cognitive (e.g. content knowledge, physical activity, and game performance techniques) and their impact on personal and social skills (T. L. Wallhead et al., 2014). In this case, the comparison between SEM and traditional teaching has focused more on building independence (Viciana Ramírez & Casado Robles, 2020), motivation (T. L. Wallhead et al., 2014), and enjoyment (Cuevas et al., 2016). All of those aspects have been effectively improved when the students experienced the Sport Education treatment. Basically, the teaching style of SEM tends to be very pro-autonomy (Hastie & Buchanan, 2000), while what is maintained

when comparing traditional teaching conditions reflects more of a controlling style. To the best of the researcher's knowledge, the impact of SEM and more traditional units on developing students' self-empowerment and self-confidence has not been measured or compared directly in previous research. Instead, they are part of a series of outputs obtained through student or teacher perceptions of learning models (Ang & Penney, 2013).

Furthermore, most of the comparative studies between SEM and traditional teaching, as well as research focusing on personal and social skills in SEM reported in the literature, have involved experienced teachers as instructors (Bessa et al., 2019). Recognizing the results of research showing that pre-service teachers have difficulty in implementing different teaching models (Curtner-Smith et al., 2008), it is relevant to develop research with pre-service teachers who provide training experiences that may be challenging to use different pedagogies and fill possible gaps, both in content knowledge and in pedagogical strategies. As a result, this forms the basis for the ability and motivation of pre-service teachers to apply different teaching models in the future.

For certain learning outcomes, an optimal learning environment must be designed (Metzler, 2017). There is still a lack of controlled comparisons between SEM and traditional teaching in promoting self-empowerment and self-confidence as core learning outcomes, let alone involving pre-service teachers. This is an opportunity to challenge pre-service teachers and share information about Physical Education training programs that aim to optimize teaching and learning about Physical Education (Penney et al., 2005). With the help of classes taught by pre-service teachers, it is possible to find out whether the pre-service teachers apply each teaching method appropriately and to understand whether students notice differences between teaching methods.

In addition, research on this topic enables the dissemination of relevant data demonstrating the power of various approaches to foster student engagement and accountability. Indeed, this research may contribute to removing potential barriers in adopting different Physical Education teaching approaches, such as resistance in some Physical Education departments or beliefs and habits of in-service teachers (Penney et al., 2005). In line with the above explanation, this study aims to examine the effect of two different teaching approaches (i.e. SEM and traditional teaching model) on students' self-empowerment and self-confidence in high school Physical Education classes.

METHOD

The research design was a quasi-experimental pretest-posttest, involving 18 classes from 8 different schools. The pretest took place in the first lesson, and the posttest took place in the last lesson of the unit. Two hundred and forty lessons in ten different classes in 6 schools were taught using a traditional teaching approach, while 192 lessons in 8 different classes were taught in 6 schools following the main principles of SEM. All classes are co-education and meet twice a week for 8 weeks (one lesson is scheduled for 45 minutes and the others for 90 minutes).

A total of 429 high school students from 8 schools in the Indonesian capital, Jakarta, participated in this study. The sample consisted of 220 female students and 209 male students ranging from 15 to 18 years old. The 17 pre-service teachers (10 male and 7 female teachers) involved in this study were teachers who were continuing their master's program in the fourth semester. The pre-service teachers have had experience in teaching lessons with SEM and traditional teaching during the previous year of the course. Furthermore, during student instruction, the pre-service teachers taught the full version of the model under the supervision of experienced teachers who have been familiar with each approach and model. All pre-service teachers previously taught SEM and traditional teaching units in the same class, and this research was conducted in the third semester of the school year. For this study, pre-service teachers only taught one of two conditions (SEM or traditional teaching) in a class. The first author's university ethics committee approved the study protocol, and all participants provided informed consent after obtaining parental consent.

Ten traditional teaching units were completed in 6 schools and involved a total of 226 students from 10 different grades. The traditional teaching unit is characterized by teacher-controlled decisions and teacher-directed patterns of engagement with students. In this model, the pre-service teachers were responsible for the main managerial controls: determining learning content, applying warm-up learning, determining the pattern of technical models, controlling the rhythm of tasks, the time involved in training and transitions between activities. The pre-service teachers often provided positive and corrective feedback to students. Lessons started with basic skills practice and games, with exercises arranged in student lines providing a high level of practice and repetition. At the end of each lesson, students chose a team to compete against each other (students had different teammates at each lesson). The last three lessons were dedicated only to competitions between teams, which were organized by pre-service teachers. All recording was done by the teachers. No formal statistics were kept. The students were involved in instruction throughout the class and were not responsible for roles such as refereeing and grading.

The Sport Education Model (SEM) employs the characteristics of affiliation, formal competition, recording, parties and top events. In early lessons (1-2), the pre-service teachers presented and explained the model, roles, and the format of the competition. Equally skilled teams were created by pre-service teachers, following criteria of homogeneity in gender and motor ability level. These teams were maintained throughout the season. After being placed in teams, students were given roles, designed colored shirts, and determined the name of their team. All students practiced different roles (at some point of the season) such as coaching the team, refereeing, keeping score, and maintaining team and individual statistics; however, no formal statistics were posted. The following four lessons (3–6) were led by a pre-service teacher for an introduction to basic skills. In the student-led phase, lessons began with a warm-up (led by students), practice in the first round and the second round seeing formal competition. Lessons 7 to 15 involved teams practicing and competing against each other while learning the roles such as referees, scorekeepers, and statisticians. Then, lessons 16 to 23 were dedicated to tournaments. In this lesson, the score associated with fair play was linked, which counted toward each team's final score. The final lesson consisted of the final competition and awarding ceremony.

A 10-item checklist with benchmarks (Hastie et al., 2013) was used to assess the behavioral fidelity of pre-service teacher instruction according to SEM or traditional teaching (Table 1). The checklist was checked by a trained observer to decide whether an item is representative of the lesson. In this case, two learning model experts with extensive research in learning models examined the video recordings of four randomly selected lessons from each class to confirm the characteristics of the model used in the lesson. The analysis performed by both experts revealed 100% inter-observer agreement, confirming the instructional model used in the lesson.

Table 1. Instructional Checklist (Hastie et al., 2013)

1	Groups of students go to designated areas of the house and start warming up in their own group.
2	Students warm up as the whole class under the direction of the teacher.
3	Students practice together with their groups/teams under the direction of a peer leader.
4	Students practice individually or in small groups under the direction of the teacher.
5	Students remain part of an easily identifiable group throughout the lesson and during different assignments.
6	The grouping of students across lessons is variable across assignments.
7	Performance records are kept by students.
8	Students perform specific tasks in groups/teams.
9	Student performance scores are calculated in formal and public assessment systems.
10	Student performance scores are not privately recorded.

To be effective, the learning model requires contextual conditions such as the teacher's ability and students' willingness to model it (Metzler, 2017). All pre-service teachers are familiar with both models, have experienced SEM and traditional teaching as participants during on-campus courses, and have taught SEM and traditional teaching unit/season. The pre-service teachers also attended a three-hour SEM workshop led by a researcher who is familiar with the SEM curriculum and the challenges of implementing this model in schools. There is sufficient

space and equipment (e.g. balls, goalscorers, whistles, etc.) in all schools for each grade to create adequate pedagogical and practical conditions. Table 3 provides data confirming the characteristics of the model used in lessons by each pre-service teacher.

Spreitzer's (Yu et al., 2015) 12-item Psychological Empowerment Instrument (PEI), (dos Santos et al., 2014), was used to measure students' self empowerment. The Psychological Empowerment Instrument test and retest reliability have been shown to be robust and the estimated validity for the dimension is usually around 0.80 (Uner & Turan, 2010). Items are distributed by four dimensions: meaning, competence, self-determination, and impact. Meaning reflects the value of goals or work goals, assessed in relation to the ideals or standards of the individual (Thomas & Velthouse, 1990). Then, competence, or self-efficacy, reflects an individual's belief in his capacity to perform activities with skill (Gist, 1987). After that, self-determination reflects autonomy in the initiation and continuation of behavior and work processes (Bell & Staw, 1989). Finally, impact reflects the degree to which an individual can influence strategic, administrative or operational outcomes in the workplace (Ashforth, 1989). Sample items include, "The role I have in class is very important to me" (meaning); "I am confident about the performance I have in Physical Education class" (competence); "I have significant autonomy in determining how I do my assignments in Physical Education class" (self-determination); and "I have a lot of control over what happens in Physical Education class" (impact). All items were measured using a 7-point Likert scale that ranged from 1 (strongly disagree) to 7 (strongly agree).

Self-confidence was measured with the 9-item self-confidence sub-scale of the Competitive State Anxiety Inventory-2 (CSAI-2) (Martens et al., 1990) translated and adapted for Indonesian populations by (Putra & Guntoro, 2022). CSAI-2 has been widely used by researchers as a means to explain independent forms of the influence of somatic anxiety, cognitive anxiety, and self-confidence on sports performance. The validity and reliability of this instrument have been verified (Putra & Guntoro, 2022). Sample items include "I feel comfortable" and "I feel safe". All items were measured using a 5-point Likert-type scale that ranged from 1 (never) to 5 (always).

Both questionnaires were completed in the classroom during school time in the presence of the first author. The average turnaround time was 10 minutes. Pre-test data were collected at the unit/season first lesson, while post-test data were collected after the unit/season last lesson.

The IBM Statistical Package for the Social Sciences (version 26) was used to analyze the data. Descriptive analysis performed to characterize the sample revealed an abnormal distribution of the data. Therefore, non-parametric statistics were used. Scale reliability was obtained for the pre-test and post-test using Ordinal alpha for Likert scale data. Ordinal alpha is conceptually equivalent to Cronbach's alpha and performs better for ordinal data (Zumbo, 2006).

The Mann-Whitney test for two independent samples (self-empowerment and self-confidence) was used to test for differences between groups in the two moments of assessment, pre-test and post-test. To examine intra-group differences from PreT to PostT, the Wilcoxon test was applied. When Wilcoxon results in a significant difference, further analysis is performed at the subscale level to provide insight into the exact location of the difference. The effect size is estimated with the r statistic for the non-parametric test (Field, 2018) using the formula: $r = Z/\sqrt{N}$ in which Z represents the Z score resulting from the non-parametric test; and, N to the total number of subjects. According to Cohen (Cohen, 1988), small effect sizes with $r < 0.30$, medium effect sizes with r between 0.31 and 0.50, and large effect sizes with $r > 0.50$ are considered. The statistical level for determining significance was set at $p < 0.05$.

FINDINGS AND DISCUSSION

Findings

Tables 4 and 5 present the Ordinal alpha coefficients and descriptive statistics for both conditions and all measures in the pre-test and post-test. Ordinal alpha coefficients of all subscales show values above 0.70, which can be considered acceptable. Regarding the descriptive statistics, there are certain changes in the mean and standard deviation between the pre-test and post-test in both groups.

Table 2. Descriptive statistics and subscale internal consistency for traditional teaching context (n = 226)

Measure Subscale	PRE-TEST				POST-TEST			
	Ord.α	M (SD)	M_e	Ske Kur	Ord.α	M (SD)	Me	Ske Kur
CSA-2	0.89	3.79	3.78	-0.40	0.91	3.70	3.79	-0.44
Self-confidence		(0.04)		-0.09		(0.05)		-0.25
SPES	0.95	4.90	4.90	-0.45	0.96	4.85	4.99	-0.46
		(0.06)		1.40		(0.07)		0.54
Meaning	0.87	4.88	4.88	-0.09	0.90	4.80	5.00	-0.36
		(0.07)		0.32		(0.08)		-0.09
Competence	0.86	5.25	4.98	-0.57	0.85	5.05	4.95	-0.59
				0.84		(0.07)		0.83
Self-determination	0.75	4.89	4.98	-0.70	0.89	4.89	4.95	-0.59
		(0.07)		1.39		(0.08)		0.50
Impact	0.70	4.61	4.54	-0.30	0.84	4.70	4.55	-0.31
		(0.07)		0.76		(0.07)		-0.03

Table 3. Descriptive statistics and subscale internal consistency for SEM context (n = 204)

Measure Subscale	PRE-TEST				POST-TEST			
	Ord.α	M (SD)	M_e	Ske Kur	Ord.α	M (SD)	Me	Ske Kur
CSA-2	0.84	3.68	3.68	-0.33	0.90	3.97	3.99	-0.69
Self-confidence		(0.04)		-0.87		(0.05)		1.09
SPES	0.95	4.79	4.73	-0.26	0.95	5.23	5.19	-0.32
		(0.06)		0.66		(0.07)		-0.34
Meaning	0.89	4.61	4.59	-0.44	0.89	5.13	5.00	-0.46
		(0.08)		0.18		(0.08)		0.12
Competence	0.88	5.15	4.98	-0.73	0.85	5.43	5.25	-0.26
		(0.07)		0.79		(0.07)		-0.31
Self-determination	0.71	4.92	4.98	-0.29	0.84	5.29	5.25	-0.66
		(0.08)		-0.09		(0.08)		0.50
Impact	0.68	4.51	4.28	-0.32	0.79	5.11	4.95	-0.12
		(0.07)		0.99		(0.08)		-0.35

In the pre-test, the initial homogeneity between groups was assessed using the Mann-Whitney test on the dependent variables: self-confidence and self-empowerment (Table 4). In the post-test, a significant difference was found between SEM and the traditional teaching groups on students' self-empowerment perception ($p = 0.001$), with a small effect size ($r = 0.18$). In addition, a significant difference was found in students' self-confidence perception ($p < 0.001$), with a small effect size ($r = 0.19$).

Table 6 presents the results of the Wilcoxon Rank test used to analyze the differences obtained within the groups. Significant pre-post intervention differences were found between study groups in the dependent variable examined (Table 6). Regarding the SEM group, there was a sizeable increase in students' perceptions for both variables, self-empowerment ($p < 0.001$, $r = 0.46$) and self-confidence ($p < 0.001$, $r = 0.34$), from pre-test to post-test. No significant differences were found in students' perceptions in the traditional teaching group for any variable.

Table 4. The analysis results between groups using the Mann–Whitney U test

Measure		PRE-TEST			POST-TEST			
	IA	Sum of Ranks	Z Scores	*P*	Sum of Ranks	Z Scores	*P*	R
CSA-2	TT	62,068.50	-1.79	0.078	54,972.00	-3.710	<0.001	0.19
(Self-confidence subscale)	SE	41,607.50			48,704.00			
SPES	TT	61,729.50	-1.38	0.147	44,233.50	-3.568	0.001	0.18
	SE	42,045.50			48,431.50			

Table 5. The analysis results using the Wilcoxon test for self-empowerment and self-confidence over time (results of pre-post test)

Measure	IA	Z Scores	P	R
CSAI-2	TT	-1.788	0.090	0.11
	SE	-4.536	<0.001	0.34
(Self-confidence subscale	TT	-0.618	0.598	0.06
	SE	-5.882	<0.001	0.54

Table 6 shows the subsequent analysis conducted at the self-empowerment subscale level to provide insight into the exact location of differences. Considering the perceptions of Sport Education students, the results show significant improvement on all subscales ($p < 0.001$), present a large effect size for impact ($r = 0.52$), and a sizable effect size for meaning ($r = 0.42$), competence ($r = 0.28$), and self-determination ($r = 0.28$).

Table 6. The analysis results using the Wilcoxon test for the self-empowerment subscale (results of pre-post test)

Measure	Subscale	IA	Z Scores	P	R
SPES	Meaning	SE	-5.581	<0.001	0.42
	Competence	SE	-3.571	<0.001	0.28
	Self-determination	SE	-3.651	<0.001	0.28
	Impact	SE	-6.623	<0.001	0.52

Discussion

The purpose of this study was to examine the effect of applying two different learning models (SEM and traditional teaching) by pre-service teachers on the self-empowerment and self-confidence of students in Physical Education classes at secondary schools. The results of this study indicate that only SEM is effective in increasing the high school students' self-empowerment and self-confidence, supporting the first hypothesis. This effectiveness was confirmed by comparison with data from the traditional teaching group, with a significant increase for the SEM group in the studied variables. While in the SEM group, the participants showed significant increases in levels of self-empowerment and self-confidence, in the traditional teaching group, no gain was found, which confirms the second and third hypotheses. In fact, in the traditional teaching group, the level of self-empowerment and self-confidence decreased over time, although this decrease was not significant. This kind of effect has previously occurred in research by Spittle & Byrne (2009) where traditional conditions were associated with a decrease in students' personal and social variables, namely perceived competence, task orientation, and climate mastery. According to these authors, this effect may be partly due to the high level of initial motivation. In addition, the length of traditional instructional units may also have contributed to this decline, since traditionally, this type of physical education class rarely spent so much time on just one sport. If the experience is not positive and successful, students can become demotivated and sacrifice their sense of self-empowerment and self-confidence.

Looking at the decrease in student empowerment in traditional classrooms, one possible explanation for this finding is that pre-service teachers are in charge of all decisions (planning, teaching, evaluating, student participation models, etc.), limiting students to passive and generative behavior, leaving no room for decision making or problem-solving.

On the other hand, a marked (though not significant) decrease in students' self-confidence in the traditional classroom group was observed when there was a lot of positive feedback from the teacher. This may be because students have previously experienced different models of SEM, and may ultimately have had fewer opportunities to develop these variables. In addition, we also believe that the results of self-empowerment may have influenced these results. Therefore, when students do not feel empowered, they do not feel confident.

The effectiveness of the SEM class in empowering students and increasing self-confidence mainly lies in the strategies used during the season. Examples include opportunities to have specific roles and responsibilities that encourage students to express themselves and make decisions, opportunities to exercise control over learning, and opportunities for students to solve

problems and make decisions. In this sense, students can experience motivation for self-esteem and self-confidence. Likewise, it can help students make decisions and encourage them to solve problems on their own, so they feel in control. This can ultimately increase a sense of belonging and empowerment, both of which are important ingredients in developing self-confidence.

Regarding variables learned for the benefit of SEM, similar results have been reported in the research of (Gil-Arias et al., 2017), wherein a hybrid TGfU/Sport Education Unit, students feel empowered because they are given the opportunity to solve certain tactical problems. Likewise, (Hastie & Buchanan, 2000) which is incorporated throughout the TGfU/Sport Education Unit shows many examples of problem-solving without providing solutions, which are suggested to contribute to student empowerment. Regarding self-confidence, the results of this study are consistent with previous research showing that self-confidence-boosting strategies, stimulating learning environments and perceptions of different roles used during Physical Education classes are positive keys for student development (MacPhail et al., 2004).

A review of research on the development of students' personal and social skills when participating in Physical Education classes with SEM (Bessa et al., 2019) shows that only 23% of studies (12 studies) incorporate comparisons with traditional teaching. Among those studies, only one study (Burgueño et al., 2017) had pre-service teachers teaching Physical Education classes, reporting a significant increase. Regarding the effect size of SEM, the results of this study confirm not only changes in the studied variables but also moderate to large effect sizes. Similar results were achieved in a different study using experienced teachers (Bessa et al., 2019), indicating that pre-service teachers use each teaching approach appropriately.

Although the literature on pre-service teacher experiences in teaching SEM identifies certain challenges such as omissions of vital aspects of the model (Curtner-Smith et al., 2008; McCaughtry et al., 2004) or problems in encouraging students to work (McMahon & MacPhail, 2007), the results of this study indicate that pre-service teachers who teach SEM are able to create conditions that are conducive to the development of self-empowerment and self-confidence. These results highlight the effectiveness of Physical Education teacher education programs attended by pre-service teachers, taking into account recommendations (Curtner-Smith, 2011) to provide practical experience, as students and teachers, with different teaching approaches and models, supervised by experienced teachers.

We can note several strengths in this study. First, teacher loyalty to teaching each model is measured and reported. The second sthength is shown by that this research involved a large sample in different schools. Thirdly, the duration of SEM exceeds the appropriate recommendations in high schools (Siedentop et al., 2011). However, research has shown that programs on social and emotional learning need to continue and adopt a multi-year approach. Thus, in strengthening the suggestion of past reviews (Araújo et al., 2014; T. Wallhead & O'sullivan, 2005), future research should adopt more longitudinal data collection protocols, involving multiple seasons/units.

CONCLUSION

This research suggests the suitability of SEM in Physical Education classes but is not without limitations. To reduce the "teacher effect" that may occur when different teachers teach different learning approaches (Browne et al., 2004), future research should involve the same teacher in the same class to teach all groups. Pre-established classes in schools complicate the random assignment of students, but must be considered as a design limitation. Future research might consider developing experimental research because randomly assigning students to experiments and comparison conditions provides a greater certainty that between-group differences in outcome measures could result from interventions. Another limitation is that this study was conducted in the context of a real Physical Education class which reduces the internal validity. However, the importance of ecological validity must also be considered, which consequently makes the results and conclusions relevant.

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