LESSON STUDY IN PHYSICAL EDUCATION CLASSES:IMPROVING THE QUALITY OF TEACHER TEACHING

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Abstract

Innovation in the teaching of physical education is urgently needed by teachers in today's era. Therefore, our research aims to apply lesson study to improve the quality of teacher teaching. This study adopted a pre-experimental method. Participants in this study came from physical education teachers from the Surabaya (Indonesia) area, totaling 12 elementary school teachers.The quality of learning is measured by looking at two aspects: teaching skills observed from recorded processes on how teachers managed the classroom and from students' formative class evaluation questionnaire after the learning process. The initial measurement and training on managing the classroom were given to the participating teachers before lesson study was conducted. Furthermore, The lesson study program was carried out for 12 cycles. The same measurement was taken during and after lesson study concluded. All data in this study were processed using IBM SPSS with ANOVA analysis and effect sizesThe results of the study found that lesson study at the during and after stages was proven to significantly improve the quality of teacher teaching ($p<0.05$), but not at the previous stage ($p>0.05$). Thus, this study becomes one of the evidences regarding the positive effects provided by lesson study. This research contributes to efforts to improve the teaching quality of physical education teachers in Indonesia.

Keywords: Lesson Study. Physical Education. Quality of Learning

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Introduction

It is widely accepted that teachers are key players in determining the quality of education (Budiharso & Tarman, 2020; Sukadari et al., 2021). In Indonesia, the quality of teachers is cause for alarm, as average competency scores based on national standards tend to fall below national targets (Team of Directorate General of Teachers and Education Staff, 2018). Given the circumstances, there is an immediate need for the professional development of teachers to raise competency standards in Indonesia. For this research, the selected professional development program is a sustainable program that is integrated with teacher community projects. It was selected based on important findings from previous research on various ways of implementing continuing professional development programs, which includes traditional methods involving teacher communities or any professional learning communities as a central vehicle for the self-development of teachers (Armour & Yelling, 2007). However, when professional development relates to governmental policy, there should be collaborations between government, universities, and schools as intertwined parties to improve the quality of teachers (Curtis, 2015; Suroto, 2016; Kim, Raza & Seidman, 2019; Algethami, 2022). The determination of suitable professional development programs for teachers is indeed a complex task. However, research findings which successfully developed and adopted professional development programs for teachers are very helpful in providing appropriate references for decision-making.

Lesson study (LS) is a type of professional development program originating from Japan and believed to have an effective use in teacher professional development across countries (Takahashi & McDougal, 2016). This program has been adopted in many countries since it was first formulated two decades ago (Lewis et al., 2006; Perry & Lewis, 2009; Aykan & Yıldırım, 2022). Basically LS is a professional development where teachers have to plan, implement, observe and discuss lessons in class (Alvine, Judson, Schein & Yoshida, 2007; Huong, Thi Thuy Quynh, Thi Ngoc & Mau Duc, 2021). Previous studies suggested that LS can also connect to many types of effective professional development programs, such as overcoming learning practices problems, teacher's focus in teaching students, group teaching practices, creating a professional learning community and sustainable ongoing learning opportunities (Desimone, 2009; Jansen, Knippels & van Joolingen, 2021). When it comes to integrating LS to research, this method is classified as action research with adjustable features to the needs of teacher professional development (Lewis et al., 2009; Dudley, 2013; Danday, 2019). A research in the UK conducted by the University of Exeter that works with more than 100 teachers has identified several benefits provided by LS, that LS gives significant changes in teaching and learning practices in schools through teacher collaboration (Ylonen & Norwich, 2012). LS can be applied starting from the macro-level context (covering national), meso-level (organization) and micro (learning context) (Hadfield & Jopling, 2016).

Although research on LS has been popular and well documented (Grimsæth & Hallås, 2015; Kihara et al., 2021; Borghouts et al., 2021; Aykan & Yıldırım, 2022), however there is still little research on LS in the context of physical education. In this research, LS refers to the implementation of LS at the micro-level to improve the learning process. Specifically, the improvement focuses on the quality of classroom management conducted by teachers, without having to intervene in school policy, let alone the educational system. Instead, LS processes are adjusted to accommodate the needs of schools to meet national curriculum standards in improving the learning process. Although it does not intervene in school policy, LS implementation requires support from the school through the role of the principal as the program supervisor. Hence, the process of quality control is carried out by the main supervisor, the school principal (van der Bij et al., 2016). By involving the school principal as a driving force in the school, it is hoped that LS can produce a sustainable improvement in quality of learning.

This study aims to apply LS in physical education class to improve the quality of teacher teaching. This research is also expected to contribute to increase teacher professional is in the teaching and learning process at school. Finally, the result contributes to other evidence on the effects of LS on the learning process as well as indicating one of the problems faced by the researchers in an attempt to improve the learning process.

Materials and methods

Participants

Data for the present research was obtained using an action research process which aimed at helping PE teachers developing their professionalism. The action research activities were conducted for a teacher community of a primary school at the district level. Twelve PE teacher comprising of 12 male teachers were appointed by their communities to take part in conducting LS.

The ways to recruit them are (1) researchers conducted a survey to several schools in Surabaya (Indonesia), (2) researchers sent invitations to participate in research via Whatsapps to teachers, (3) researchers recorded how many teachers were willing to participate in research In this case, (4) teachers were provided with information about the research and required to make a statement about their willingness to participate in all activities in the intervention program, (5) teachers who participated in the study were given a $10 gift as a thank you for participating. The socio-demographics of the participants are presented in (Table 1).

Instrument

The instruments used were a checklist for teaching skills (TS) and formative class evaluation (FCE). The TS checklist focused on PE teachers' skills in managing their classrooms. A total of 12 skills (Metzler, 1990; Siedentop & Tannehill, 2000; Silverman, 1991) were assessed by the rater team through analyzing

Table 1. Socio-demographic of participants

Participants	Age	Degree	Work experience
Teacher 1	34	Bachelor	6
Teacher 2	51	Bachelor	29
Teacher 3	41	Master	6
Teacher 4	36	Bachelor	7
Teacher 5	52	Bachelor	30
Teacher 6	29	Bachelor	5
Teacher 7	40	Bachelor	6
Teacher 8	31	Bachelor	4
Teacher 9	44	Bachelor	10
Teacher 10	39	Bachelor	6
Teacher 11	44	Master	16
Teacher 12	40	Bachelor	6

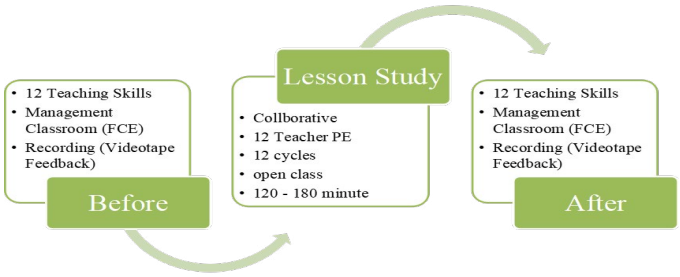

Figure 1. Lesson Study Program.

instructional videos. The score was obtained by counting the number of times that the indicators appeared during the instruction. Each skill consisted of 5 indicators (activities). When one indicator occurred, the teacher in the video achieved a score of 1. When the teacher completed all indicators, s/he would achieve a total score of 60. Indicators used in the research were adjusted with the learning demands cited in the National Curriculum for Indonesia. The second instrument was FCE, which refers to a questionnaire to measure the effectiveness of PE learning by making use of students' responses. The use of this questionnaire is considered valid and reliable in Japan (Hasegawa et al., 1995) and Indonesia (Wijaya & Astono, 2006). The FCE questionnaire comprises of 9 items with 4 components: outcome, motivation, way of learning and cooperation (Suroto, 2005).

Procedures

This research was conducted in three phases and lasted for three years (2020-2022). This research was carried out at the State University of Surabaya (Indonesia) with the approval number: E-458/UNESA/2020). In addition, the research follows the guidelines of the World Medical Association Code of Ethics (Helsinki Declaration for humans). The first year was a preliminary assessment. The second-year began with training in managing PE learning using LS. The training was aimed at discussing all indicators that must be achieved to achieve good quality instruction. Also, it informed the teachers on the standards of the National Curriculum for Indonesia. The second-year was also a phase where the researchers implemented LS training for teachers, which consisted of mentoring and open-classes. Each learning process was discussed with the researchers (as subject experts) and school principal/other supervisors to give correctional feedback. Teachers then used LS for 12 cycles. The third-year is where the final assessment conducted. The LS program is presented in (Figure 1).

Statistical analysis

The data analysis started with descriptive statistics (mean and standard deviation) followed by normality test Kolmogorov-Smirnov with p>0.05. To determine the significance of value change, the researchers used a ANOVA (Singh et al., 2013) and effect size (d) using calculations: small d:<0.5, medium d: 0.5-0.79 and large d: >0.85 (Gani et al., 2022; Juliantine & Setiawan, 2022).

Results

The results of descriptive statistics are presented in (Table 2). While the results of the normality test show that the distribution of each variable is normal (p>0.05). (Table 3) shows that there is no difference in the value of TS and FCE at the stage before LS. Meanwhile, there are differences in the values of TS and FCE at the stage during the LS (Table 4) and (Table 5) shows that there are difference in the value of TS and FCE at the stage after LS.

Table 2. Descriptive statistics.

Variable	Assessment stage	M	SD	N
TS	Before	27	5.97	12
	During	33.5	4.62	12
	After	25.3	5.43	12
FCE	Before	2.7	0.135	12
	During	2.8	0.091	12
	After	2.8	0.104	12

Note. TS: Teaching skills, FCE: Formative class evaluation, M: Mean, SD: Std. Deviation, N: Participants

Table 3. The difference between the TS and FCE scores in the Before LS Stage.

Variable	M	SD	p-values	d
TS	22.65	2.32	0.123	0.002
FCE	24.65	1.12	0.137	0.003

Note. TS: Teaching skills, FCE: Formative class evaluation, M: Mean, SD: Std. deviation, d: Effect size

Table 4. The difference between the TS and FCE scores in the During LS Stage.

Variable	M	SD	p-values	d
TS	56.34	4.32	0	0.82
FCE	45.67	3.12	0.002	0.78

Note. TS: Teaching skills, FCE: Formative class evaluation, M: Mean, SD: Std. deviation, d: Effect size

Table 5. The difference between the TS and FCE scores in the After LS Stage.

Variable	M	SD	p-values	d
TS	58.12	5.32	0.004	0.87
FCE	49.56	4.12	0	0.81

Note. TS: Teaching skills, FCE: Formative class evaluation, M: Mean, SD: Std. deviation, d: Effect size

Discussion

This study aims to apply LS in physical education class to improve the quality of teacher teaching.

The findings of this study indicate that LS is significantly proven to improve the quality of teacher teaching. In addition, this study found that the increase in TS and FCE occurred during and after the of applying LS, but not at the before stages. This is because the stages during the implementation of LS focus on improving learning and mentoring from facilitators as long as LS succeeds in changing the quality of teachers in managing learning (Skott & Møller, 2020). Guidance from facilitators and collaborative learning among teachers facilitates the overcoming of problems encountered during LS (Vermunt et al., 2019). Hence, teachers, facilitators and feedback videos can perform their reflective function in learning environment to improve the quality of learning (Faria, 2015). The results of this study are in line with previous studies which reported that LS is a strong intervention aspect in influencing the quality of learning in schools (Smela et al., 2019). LS can be used to improve the quality of the learning process and can be a solution to problems faced by teachers before implementing LS (Marttinen et al., 2020; Skott & Møller, 2020). Basically, the main strength of LS is that it can increase the motivation in the teacher, so that there is a change in teaching abilities (Navarro-Patón et al., 2019; Montesdeoca Hernández et al., 2019).

Finally, the LS program can run optimally if it follows the curriculum implemented in schools, so that LS can be aligned with the school's vision (Kihara et al., 2021).

Conclusions

This study concludes that the LS program applied to physical education classes has proven to be effective in improving TS and FCE. However, this study still has limitations in that the participants used are relatively few and only come from one area in Indonesia. Therefore, future research needs to add more participants from several regions in Indonesia.

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Conflict of interest

All authors confirm that there is no conflict of interest whatsoever in this study.

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