

ORIGINAL SCIENTIFIC PAPER

The Development of Physical Education Learning Models for Mini-Volleyball to Habituate Character Values among Elementary School Students

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Abstract

This research aims to produce, implement, and test the effectiveness of a mini-volleyball learning model, in particular, to habituate character values among elementary schools students. It was conducted using a research development (R&D) method. The research samples comprised 30 physical education teachers and 252 elementary school students. The data were collected using quantitative and qualitative approaches. The research instruments were interview, questionnaires, rubrics, and authentic assessment. The learning model's content validity was tested by seven experts, and construct validity was tested using Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). Furthermore, the model's effectiveness instrument was developed based on a rubric and authentic assessment to assess character development. The validity was tested by three experts, and the reliability was tested with an interclass correlation (ICC) test. Four inter-rater or independent observers were involved in assessing the model's effectiveness. The results of this study determined that the model of mini-volleyball learning materials successfully habituated the character values of discipline, cooperation, and hard work with a t-value of -11.700 and significant value is 0.000.

Keywords: physical education, mini-volleyball, character, values

Introduction

Character and values are strongly associated with personal principles and attitudes in one's daily routine (Lestari, Adhe, & Al Ardha, 2019). They develop the most during childhood (Navarro-Patón, Pazos-Couto, Rodríguez-Fernández, & Arufe-Giraldez, 2020). Furthermore, children's environments have the most significant contribution in providing any character model (Ganiere, Howell, & Osguthorpe, 2007). Sport can be an appropriate source of conveying character values, with direct application in the field (Montesdeoca, Marchena, & Mateos, 2019). For example, children learn about cooperation, respect for friends and opponents in volleyball (Gomes & Buckley, 2017). Team sport activities are a great environment to enrich, develop, and display good character for children (Steen, Kachorek, & Peterson, 2002). Moreover, a sports environment benefits child with social and moral character experiences (Rudd, 2005).

Physical education (PE) not only develops students' physical development and motor skills but also their characters (Martín Ruiz, da Vinha Ricieri, Ruiz Sanchis, & Santamaría Fernández, 2018). It utilizes sport and physical activities to accomplish the learning objectives in school. This unique characteristic of the PE classroom may direct many sport activities in the class, including team sport activity, requires students to cooperate to strengthen the students as individuals in teams and to attempt to work together with others in teams (Barker, Quennerstedt, & Annerstedt, 2015). Moreover, teamwork creates a strong bond among the students via hard work and discipline (Halldorsson, Thorlindsson, & Katovich, 2017).

This learning model is expected to facilitate all students in



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their learning, including those that have special needs or concerns (Reich & Lavay, 2017). The Activity Theory of Leont'ev (1978) states that activities should: 1) facilitate for analysis; 2) be tiered in quality; 3) be carried out consciously by objects; 4) be able to change dynamically when conditions change; 5) have their internal and external elements fused; 6) be the smallest unit of analysis; 7) be impossible to be separated from their contexts; 8) have relations with artefacts or other activities; 9) be useful to develop research; 10) be able to be explained by Vygotsky's sociocultural theory. Hashim and Jones (2007) state that conscious understanding is an essential key in learning activities. Furthermore, the activity system has six core components, including subject, object, tools, community, rules, and worker division (Foot, 2014).

The present study aims to develop mini-volleyball learning models to habituate character values for elementary school students, specifically, discipline, cooperation, and hard work.

Method

Participant

Thirty physical education teachers $(32\pm3.1 \text{ years old})$ and 252 students $(11\pm0.8 \text{ years old})$ were involved as research subjects; they were selected by proportional random sampling technique. They were from five districts in Yogyakarta, Indonesia, with different mountainous, urban, and rural areas.

Measures

There were four instruments used in this research development R&D method. The first was unstructured interviews to explore the initial information or need assessment from the 30 physical education teachers. The second instrument was a questionnaire for the students and teacher. The last were rubrics and authentic assessment to test the effectiveness of character habituation (discipline, hard work, and collaboration). The rubrics and authentic assessment were given by an inter-rater or three physical education expert to verify the model's effectiveness.

Procedures

The schools were chosen by using proportional random sampling from each district. The parents were informed about this research and signed the inform consent for their children. The interviews were conducted during teachers' community service activities. The conceptual learning model was validated and tested to determine the content and construct validity. The treatment was conducted at five elementary schools, with 252 students from July to December 2019. This research is part of dissertation at a graduate school in Yogyakarta State University. Moreover, the research procedure was approved by the Yogyakarta State University Ethics Board.

Data Analysis

The data analysis was conducted using both qualitative and quantitative approaches. The qualitative approach was used to analyse the data of expert assessment and then quantitatively analysed using the formula of Aiken's V. Exploratory Factor Analysis, and Confirmatory Factor Analysis was conducted to check the questionnaire. The learning model's effectiveness was tested using pretest-posttest design and dependent t-test analysis with SPSS software. The rubric was designed based on students' performance and tasks characteristic (Wiggins, 2011). The authentic assessment involved teachers' formative feedback in helping students understand their strengths and weaknesses (Fook & Sidhu, 2010).

Results

Based on the results of the interviews with 30 physical education teachers in elementary schools, there were three types of



FIGURE 1. Conceptual learning model for mini-volleyball games

learning models applied: 1) the tactical approach (TGfU) was applied by five teachers (16.7%); 2) the psychomotor approach was applied by eight teachers (26.7%), and 3) the drilling approach was applied by 16 teachers (53.3%) in their learning processes. This result indicates that all of the PE teachers in elementary school focus on volleyball skill and knowledge in their teaching. As a result, the new conceptual learning model for mini-volleyball games was designed based on character values or its effects.

Then, this conceptual learning model was assessed by seven experts (physical education scholars and physical education teachers) by using Aiken's calculation method (Table 1). There were five items to be assessed: Item 1 (The purpose of the learning model); Item 2 (Character values and physical activities in volleyball games); Item 3 (Learning model); Item 4 (Facility size); and Item 5 (Authentic valuation items). The resulting learning model compiled by the researchers has adequate content validity, greater than 0.82 in every assessment item.

Tahlo 1	Fynert	validation	calculation	ofthe	model	using Δ	ikon V
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Freebreten	ltem 1		ltem 2		ltem 3		ltem 4		ltem 5	
Evaluator	Score	s								
А	0	0	1	1	1	1	1	1	1	1
В	1	1	1	1	1	1	0	0	1	1
С	1	1	1	1	1	1	1	1	1	1
D	1	1	1	1	0	0	1	1	1	1
E	1	1	0	0	1	1	1	1	1	1
F	1	1	1	1	1	1	1	1	1	1
G	1	1	1	1	1	1	1	1	0	0
Σs	6		6		6		6		6	
V	0.857		0.857		0.857		0.857		0.857	

Subsequently, a small-scale test involving 60 students was arranged to verify the conceptual learning model's construct validity. It used factor analysis and varimax rotation of SPSS 23.0 to investigate the distribution of items on variables for a number of factors. Furthermore, if an item's factor loading is below 0.30, the item will be discarded. The Kaiser-Mey-

er-Olkin Measure of Sampling Adequacy (KMO MSA) was also used to measure the degree of intercorrelation between variables and factor analysis. The factor analysis can be conducted if the value of KMO MSA is greater than 0.50. The resulting KMO value was 0.758; thus, factor analysis can be performed.

Common ant		Initial Eigenva	alues	Extraction Sums of Squared Loadings			
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	4.191	46.572	46.572	4.191	46.572	46.572	
2	2.001	22.230	68.802	2.001	22.230	68.802	
3	1.262	14.024	82.826	1.262	14.024	82.826	
4	.435	4.837	87.663				
5	.358	3.979	91.642				
6	.261	2.898	94.540				
7	.201	2.228	96.768				
8	.157	1.750	98.517				
9	.133	1.483	100.000				

Table 2. Eigenvalues

Based on the result of factor analysis and varimax rotation, there are three factors for which the value is greater than 1; and three of them could explain 82.826%. Factor 1 included the basic motion of passing, the basic motion of service, and the basic motion of the blocks respectively with a loading factor above 0.564. Factor 2 included mini-volleyball, the volleyball field or modifications to it, and mini-volleyball learning support tools with a loading factor is above 0.657. Factor 3 included the use of language in the model book, pictures in the model book, and the design of the model book with loading factors above 0.500.

The instruments of the large-scale test using CFA, in five elementary schools in the Special Region of Yogyakar-

ta (Turunan Panggang State Elementary School of Gunung Kidul; Muhamadiyah Sapen Yogyakarta Elementary School; Muhammadiyah Pendowoharjo Sewon Elementary School, Bantul; Klopo Sawit Turi State Elementary School, Sleman and Proman State Elementary School, Kokap Kulon Progo) in five districts and conducted by random cluster sampling in which the schools are either public or private, with the number of students of 252 people (Figure 2).

Figure 2 shows that the learning model consists of the variables: physical activity of volleyball game (K), volleyball game facilities and equipment (L), and language, pictures, and book design in the learning model (M). Indicators of the physical activity of volleyball variable include low and top passing



FIGURE 2. Standardized CFA.

motion material (A), basic serve move material (B), and basic smash and block moves material (C). Indicators of the volleyball game facilities and equipment include mini-volleyball (D), mini-volleyball court or its modification (E), and learning support equipment: blankets, cones, baskets (F). Indicators of language variables are the model book design and pictures, including language in the model (G), picture in the model (H), and the model of book design (I). The learning model effectiveness was an instrument that was formed by rubrics and authentic assessment of discipline, cooperation, and hard work character. The effectiveness instrument was validated by the expert in character education, the experts in the field of educational evaluation, and the experts in the field of physical education. The results of the experts' validation of the instrument for the test of model effectiveness can be seen in Table 3.

Table 3. Experts' validation for the test instrument of model effectiveness

Evoluator	ltem 1		ltem 2		ltem 3	
Evaluator	Score	s	Score	s	Score	s
А	1	1	1	1	1	1
В	1	1	1	1	1	1
С	1	1	1	1	1	1
∑s	3		3		3	
V	1		1		1	

The instrument's reliability of effectiveness was conducted by using the interclass correlation (ICC) test. The ICC value is 0.929 or in the excellent reliability criteria. The effectiveness instrument was given by the inter-rater or four independent observers in every treatment. The resulting mean difference between pre-test and post-test is -2.507, while the t value is -11.700 with a significance value of 0.000 (Table 4), which means that there are significant differences in discipline, co-operation, and hard work of students before and after the implementation of the learning model.

Table 4. Paired Samples Test								
		M±SD	t	df	р			
Pair 1	Pre-test Post-test	-2.507±1.855	-11.700	74	.000			

Discussion

Based on the t-test result, there was a significant difference after the implementation of the mini-volleyball learning model. The treatment successfully enables students to possess the characteristics of discipline, cooperation, and hard work. In addition to those three characteristics, the implementation of character habituation in this research included: 1) the value of self-confidence, shown when students succeeded in doing a large number of top pass with 43 times pass to the wall; 2) the value of helping or mutual assistance, shown when one student fetched the fallen chest number of another student and returned it to their friend; 3) the value of honesty, shown when a student reported to the teacher that their shift number was damaged due to being exposed to the ice cream that they had eaten; 4) the value communication, shown on blanket ball play where the four players counted together when throwing and catching the ball; 5) the value of courage, shown when students dared to ask to the teacher questions, and when one of the students dared to perform their slogans and playing pledges; 6) the value of sportsmanship, shown when playing mini-volleyball, in which each player played earnestly but not caring who ultimately won or lost, and everyone could accept whatever the results of the game were.

The hierarchy of character habituation activities in this research began with the value of cooperation as the main philosophical value of mini-volleyball games. Furthermore, character values of discipline and hard work are interconnected with each other in every mini-volleyball activity. Activities in the mini-volleyball game begin with the lowest level of difficulty, then increase to a higher level of difficulty in order for the students to easily learn the material of moves activities and the habituation of values in the game. These learning activities consciously carried out by students were also relevant to the theory of games that must be done consciously, voluntarily, and seriously (Hashim & Jones, 2007). The activity can be modified in any conditions, such as the weather and/or the students. It can also utilize both printed media and/or IT, which can be accessed by the teacher or the

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Conflict of Interest

The authors declare the absence of conflict of interest.

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student's devices.

The teacher's role in this learning model was to observe, model, assess, and facilitate the habituation of students' character values through mini-volleyball games (Spray, 2002). The teacher also interacted with students in order to achieve learning goals. The teacher should also guide the students to understand the causes and the consequences of physical education learning (Thompson, 2002).

The learning model has three main components: physical activity learning, learning facilities, and tools. Therefore, it is appropriate to habituate the character values, which is a learning process that cannot be automatically formed but requires a long process, in which learning is habituated both in theory and practice to prepare the children to face future challenges. It is important to follow the character education basic guide-lines for developing children's character (Pala, 2011).

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