



Developing Learning Tools of Long Jump Hang Style in Vocational High Schools Through Problem-Based Learning Approaches

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History Article

Received 02 October 2019
Approved 29 November 2019
Published November 2019

Keywords

Functional Movement Screening, Core Stability, Movement Pattern

Abstract

This study aimed at describing: 1) validity, 2) practicality, and 3) effectiveness of long jump hang style learning tools in vocational high schools through problem-based learning approach in terms of the learning outcomes and attitudes towards physical education learning. This research used the 4D model development research. The product trials were conducted in SMK N 1 Cangkringan at X class of APHP 1 and APL 1. The instruments employed 3 types to measure: a) its validity, b) its practicality, and c) its effectiveness. The results of the research showed that 1) the long jump hang style learning model with the problem-based learning approach in the form of syllabus, lesson plans, worksheets, and evaluation instruments respectively fulfilled the category of "very valid". 2) The learning tools also fulfilled the category of "very practical". 3) The passing rate of learning outcomes reached more than 75% in X class of APHP 1 and 80.65% in APL class X 1. The students' attitudes towards physical education learning obtained the high minimum category of more than 80%, namely for X class of APHP 1 and 90.32% for class X APL 1. Thus, the device can be declared as effective based on the learning outcomes and attitudes towards physical education learning

How to Cite

Listiono, B. & Winarni, S. (2019). Developing Learning Tools of Long Jump Hang Style in Vocational High Schools Through Problem-Based Learning Approaches *Journal of Physical Education, Health and Sport*, 6 (2), 43-49.

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INTRODUCTION

National education system is constantly evolving to adapt to the needs in the 21st century that emphasizes the ability to think critically and to make judgments; to solving complex problems, and to promote creativity and entrepreneurship; effective communication and collaboration; innovation; and responsibility for financial, health, and citizenship responsibilities (Winataputra, 2013: 10). This ability implies that education including physical education, sports, and health education not only has a role in gaining knowledge but also in shaping the students' attitudes and mindsets. As emphasized by Sysoieva and Dereka on the importance of cognitive motives and cognitive abilities of individual development as the basis for successful learning and readiness for self-education during professional physical training.

Physical Education is designed to improve physical fitness, develop motor skills, knowledge, and healthy and active life behaviors, sportsmanship, and emotional intelligence (Samsudin, 2008: 2). Physical education is a subject whose position is vital for the development of Human Resources (HR). The existence of Physical Education has been recognized by the government Law No. 20 of 2003 concerning the National Education System article 42, in particular, the contents of the elementary and secondary education curriculum which sets Physical Education as subjects that must be given at schools starting from elementary school to high school.

To educate and develop learners' skills, physical education trains students on how to behave and think with various problems in daily life. In fact, physical education in Indonesia mostly uses conventional methods. Most studies reveal its methods, approaches, and learning strategies used conventional methods. In conventional learning, most students are only given the material or method without being told the process of problem solving. As a result, students' mastery is limited to memorization.

The knowledge that is only based on memorization causes a lack of knowledge among students about physical education. It has been the cause of low learning achievement, especially for the long jump hang style. The preliminary observational data in April 2014 from X class of Agricultural Product Processing Technology/ Teknologi Pengolahan Hasil Pertanian (TPHP) in State Vocational High School 1 Cangkringan in the Academic Year of 2014/2015 showed that

most of students have difficulty in understanding and mastering the long jump hang style, i.e. 66.7% for male and 78.9% for female students.

In relation to learning outcomes, attitude plays a very important role. In order to achieve competence and good learning outcomes, it is obligatory to balance with a positive attitude. The students who start liking Physical Education will increase their intrinsic motivation to learn and vice versa. During the learning process, it is important to consider the material and characteristics of physical education, teaching practices, activities in the field, and the physical education teacher who becomes the facilitator in learning. It includes the placement of time, the selection of appropriate materials and learning methods, how to create student interest, and how to build a productive learning environment (Arends, 2012: 94).

The low ability of students urges to improve the quality of education, such as by providing supporting tools such as syllabus, lesson plans, worksheets, and qualified evaluation tools. The Government Regulations 19/2005 article 19 paragraph 3 expressly states that each education unit conducts a learning planning process, implements the learning process, evaluates learning outcomes, and monitors the learning process for an effective and efficient learning process. It is important to provide learning tools with a scientific approach so that the learning process can run as expected. For this reason, this study is trying to develop a learning tool for a long jump hang style in vocational high schools through a problem-based learning approach.

Problem based learning is considered appropriate to fulfill the skills needed in the 21st century by focusing on students' thinking skills, and problem solving skills through a variety of real situations; so they can become independent and autonomous learners (Arends, 2008: 43). The existence of collaboration features in problem-based learning allows students to work together with peers. Cooperation raises motivation among students to be involved in complex tasks (Arends, 2008: 43). In addition, Tan (2003: 25) explains «problem-based learning optimizes on goals, needs, and motivation that drives learning.» The cooperation and involvement of students will encourage students to enjoy the learning process, especially for physical education

METHOD

This study can be categorized as research and development based on 4-D model consisting

of define (initial-final analysis, student analysis, task analysis, analysis materials, and specifying learning objectives); design (test preparation, media selection, format selection, and initial design); develop (expert validation and test readability test and field test); and disseminate (validation testing and packaging, diffusion, adaptation)

This research was conducted at State Vocational High School 1 Cangkringan, Sleman. The test subjects were students of class X majoring in Agribusiness on Processing of Agricultural Products/ Agribisnis Pengolahan Hasil Pertanian (APHP) 1 and Laboratory Testing Analysis/ Analisis Pengujian Laboratorium (APL) 1 as well as partner teachers from the school. The determination of the research setting was the method of direct choice from the researchers. Meanwhile, the choice of X class of APHP 1 and APL 1 as subjects by considering the distribution of the female students that were higher than male students. In addition to the number, the selection of the two classes was based on different levels of cognitive ability in which APL values were higher than APHP. These differences were to be confirmed whether there were differences in mastery achievement of basic competencies in case of cognitive, psychomotor, and attitude.

The instruments used in this research and development activity consisted of 3 types to measure, a) its validity, b) its practicality, and c) its effectiveness. The data collected was then analyzed to gain the learning tools that met those three aspects. The total actual score obtained was then converted to five scales of qualitative data as shown in the following table 1

Table 1. The score conversion of five scales

Category	Interval Score
Very good (VG)	$(X > X_i + 1,5 S_{bi})$
Good (G)	$X_i + S_{bi} < X \leq X_i + 1,5 S_{bi}$
Moderate (M)	$X_i - 0,5 S_{bi} < X \leq X_i + S_{bi}$
Bad (B)	$X_i - 1,5 S_{bi} < X \leq X_i - 0,5 S_{bi}$
Very Bad (VB)	$X \leq X_i - 1,5 S_{bi}$

(Saifuddin Azwar, 2010:163)

Explanation:

X= Actual total score

X_i = mean of ideal score = $\frac{1}{2}$ (maximum score + minimum score)

S_{bi} = Ideal standard deviation = $\frac{1}{6}$ (maximum score – minimum score)

RESULTS AND DISCUSSION

The initial product and its supporting components were handed over to two expert validators to be given a score related to its validity. The validation results generally state that the instrument was feasible to be used with minor revision. The results of the assessment in the form of syllabus validation scores, lesson plans, and worksheets from each validator were summed, then the total score obtained was categorized according to the validity assessment table. For more details, here are the results of the validator assessment for syllabus, lesson plans, and worksheets on the long jump hang style

Table 2. Results of Product validation

Validator	Syllabus	Total Score Lesson plan	worksheets
I	63	111	91
II	57	102	87
Total	120	213	178
Category	Very Good	Very Good	Very Good

As for the validity analysis of the instruments in the form of achievement tests of basic competencies as well as nontest instruments in the form of questionnaires, the attitude towards the physical education was not analyzed as a whole but it was assessed per item. The score of each item from the two validators is summed then determined the criteria per item based on the device validity category table. The evaluation results of the instrument in the form of a test for achieving basic competence on the material long jump hang style presented in Table 3. Based on the results above, the learning tools in the form of syllabus, lesson plans, and worksheets as a whole can be categorized "Very Good". Meanwhile, the learning tools in the form of evaluation instruments which were gained 80% that can be categorized as "Good". It indicates that the developed had met the validity criteria.

The field trials produce practicality data from both teachers and students, the implementation results of the learning tools for the long jump hang style. In this case, the tools tested was only a long jump hang style. The field trials were conducted in two different classes, at the same time as a dissemination stage. Therefore, the practicality and effectiveness data analysis in field trials was carried out separately between X class of

APHP 1 and X APL 1 of State Vocational High School 1 Cangkringan.

Teacher practicality assessment data were obtained from teacher assessments in each development class, namely class X APHP 1 and X APL 1 SMK N 1 Cangkringan. The second assessment of the teacher is done after the teacher applies learning to use the hanging long jump learning device using a problem-based learning approach including syllabus, lesson plan (RPP), student worksheet (LKS), and Test. The follo-

wing are the results of the teacher practicality assessment and the categories on each device.

The data of practicality based on teachers' assessment were obtained from each development class, namely X class of APHP 1 and X APL 1. The second assessment of the teacher was done after the teacher applied the learning tools consisted of syllabus, lesson plan, student worksheet, and test. the results of the teacher practicality assessment and the categories on each component of learning tools presented **Table 4**.

Table 3. Results of Tes Instrument validation

Score Total Validator 1	Score Total Validator 2	Score Total	Precetage	Category
17	18	35	97,22%	Very Good
18	18	36	100%	Very Good
18	18	36	100%	Very Good
16	17	33	91,67%	Very Good
18	18	36	100%	Very Good
17	17	34	94,44%	Very Good
18	18	36	100%	Very Good
18	18	36	100%	Very Good
17	18	35	97,22%	Very Good
17	18	35	97,22%	Very Good
10	13	23	88,46%	Very Good
12	13	25	96,15%	Very Good
12	13	25	96,15%	Very Good

Table 4. The results of practicality assessment from teachers

	X Class Of APHP		Kelas X APL 1	
	score	Categori	score	Categori
Syllabus	28	Very Good	26	Very Good
Lesson plan	36	Very Good	31	Very Good
Worksheets	36	Very Good	30	Very Good
Test	31	Very Good	26	Very Good

Based on the practicality value of the teacher shows that the product of development in the form of learning tools with a problem-based learning approach to the long jump material hanging style SMK has a very good category. These results were obtained in both X class of APHP 1 and X APL 1. It means the developed learning tools had met the practical criteria according to the teacher's assessment.

The practicality aspect was not only obtained from the teacher assessment but also from the students' assessment. The assessment by stu-

dents was carried out once at the last meeting of long jump hang style learning in the two trial classes, namely X class of APHP 1 and X APL 1.

The analysis of the practicality assessment data among students in each class was done by summing the acquisition of practicality scores of each student. The total score obtained by each student was then categorized according to the student practicality evaluation table. Based on the categorization, a percentage of the assessment results of the learning tools practicality shown in the following **Table 5**.

Table 5. Percentage of Practical Results Categories from Students

Category	X Class of APHP 1 (N=32)		X Class of APL 1 (N = 31)	
	Students number	%	Students number	%
Very Good	14	43,75%	15	48,39%
Good	18	56,25%	14	45,16%
Moderate	0	0%	2	6,5%
Quite Bad	0	0%	0	0%
Bad	0	0%	0	0%

Based on the **Table 5** above, the percentage of students in X class of APHP 1 which stated that the practicality of the learning tools was 100% (43.75% from "Very Good" and 56.25% for "Good"). Meanwhile, in X class of APL 1, the practicality of learning tools with the good category was 93.55%. Based on the two class results, the field test results were obtained that there more than 80% practicality of the developed learning tools from students who stated in the good category. Thus, it can be concluded that based on the assessment of students, the developed tools had met the practicality criteria.

The observation data from the learning implementation were conducted in 2 (two) meetings during the learning process both in the trial class in X class of APHP 1 and X class APL. During this stage, the researchers acted as observers who investigated the course using the developed learning tools through the observation sheet. The statement items in the observation sheet were 12 items. The following is the recapitulation of the percentage from the learning outcomes and the category for 2 (two) meetings.

Table 6. Recapitulation of learning implementation .

Meeting	X Class of APHP 1		X class of APL 1	
	Percentage	Category	Percentage	Category
1	91,33%	Very Good	80%	Good
2	91,33%	Very Good	73,33%	Good

Based on the **Table 6** above, the learning implementation in X class of APHP 1 cannot be fully implemented 100%. In the first meeting, the students were not accustomed yet to the developed learning activities with problem-based learning approach in which in the closing activity, the students had not concluded what had been learned. On the other hand, the implementation of learning in X class of APL 1 cannot be done 100% since many students in X class of APL 1 had a chat with peers and created some noise in the classroom. This is almost happened in every subject. Therefore, in the meetings I to II, the discussion activities did not run smoothly and it also influenced the other activities.

The effectiveness data were obtained from the test data on the results of basic competencies and attitude questionnaire towards physical education learning. This data collection was done one time in the 3rd meeting after applying the long jump hang style using the developed learning tools.

The collection of effectiveness data in X class of APHP 1 was conducted on December 4, 2017, while in X class of APL 1 was on December 7, 2017. The students in each class determined the value of achieving basic potential. The results of these scores determined the number of students whether passed or did not pass to formulate the passing percentage from each class as presented below.

Table 7. Recapitulation of Basic Competence achievements

Tes	Explanation	X Class of APHP 1		X class of APL 1	
		Students (N = 32)	%	student (N=31)	%
KD	Pass	32	00%	25	80,65%
	Failed	0	0%	6	19,35%

Based on the **Table 7** above, the percentage who passed the Minimum Completeness Criteria in X class of APHP 1 and X APL 1 was 75%. It means that the developed learning tools is effective according to the results of students' achievements in basic competencies. Meanwhile, the results of the attitude questionnaire towards physical learning obtained the following recapitulation results.

Table 8. Percentage of Attitudes Questionnaire Results towards Physical learning.

Category	X Class of APHP 1 (N=32)		X Class of APL 1 (N = 31)	
	Students number	%	Students number	%
Very Good	13	40,42%	15	48,38%
Good	19	39,37%	13	41,93%
Moderate	0	0%	1	3,226%
Quite Bad	0	0%	2	6,4%
Bad	0	0%	0	0%

Based on the **Table 8**, the percentage of X class of APHP 1 who had a high minimum category was 100%. In X class of APL 1, the percentage of students who met the high minimum criteria was 90.332%. It indicates that the developed learning tools can be considered effective according to the results of the students' questionnaire towards Physical Education.

The aim of Physical Education learning is that students have the ability to master concepts, reasoning, problem-solving, ideas communication, and respect attitude. The goals of Physical Education learning certainly cannot be separated from the teacher role that is one of the important parts for the success of education.

Teachers play a crucial role in creating effective and efficient learning process that should be done in systematic planning. The learning plan can be done by providing learning tools including syllabus, lesson plans, worksheets, and proper evaluation instruments. The activities planned in the learning tools consist of the activities that are interactive, inspiring, fun, challenging, motivating, and providing sufficient space for initiative, creativity, and independence in accordance with the talents, interests, and physical and psychological development of students. However, the availability of Physical Education learning tools that contain inspirational and innovative activities, especially on the long jump style of hanging style, is still limited.

In this research, the learning tools for the long jump hang style in Vocational High Schools were developed using problem-based learning approach. The activities contained define, design, develop, and disseminate phase. The results of this development are in the form of the final

product of the learning tools and its supporting components that have been tested for its validity, practicality, and effectiveness.

The Validity of the learning tools

Based on the validation results (expert judgment), all learning devices in the form of syllabus, lesson plans, worksheets, and evaluation instruments in the form of tests had met the category very well. In addition, the developed products had met the theoretical study. In addition, the learning tools produced have components that were in accordance with the curriculum and the interrelated components. This is in accordance with the criteria of validity according to Nieven (1999: 127).

The Practicality of the learning tools

The results of the teacher's practicality assessment after applying the developed learning tools indicate that it can be used very well. This result is based on the assessment results that met the "Very Good" category. In addition, the students can use the tool very well, especially the worksheets. This is based on the results of the students' assessment who mostly stated "Very Good" in the practicality criteria of the tools.

In addition, the practical criteria were also assessed based on the results of the learning implementation which mostly categorized as "Very Good". This indicates that the learning implementation using the developed learning tools can be implemented and applied well in the physical learning process. It shows that there is consistency between the opinions from teachers and students and the components implementation in the field as mentioned by Nieven (1999: 127) for the practicality aspects.

The Effectiveness of Learning Tools

Based on the results of field trials, it is known that the learning tools of long jump hang style had met the effective criteria. Those criteria were based on learning mastery achievement in both classes, in which the students achieving Minimum Completeness Criteria at least 75% of the basic competencies. In addition, the results of the questionnaire analysis showed that the students' attitude towards the developed device was positive. This criterion is based on the achievement of the high minimum category for attitudes towards Physical Education, i.e. 80%. The effectiveness results in terms of attitudes towards the physical education learning above are in accordance with research conducted by Stanilaus Amsikan (2010) that problem-based learning is effective in improving students' level of thinking skills.

Based on the above study, it can be concluded that the development results of learning

tools for long jump hang style in vocational high schools through a problem-based learning approach that had been tested for its validity, practicality, and effectiveness was proven effective. It means that the developed product is feasible to be used as the learning tools for Physical Education learning and it can be an example for developing Physical Education learning tools on other materials with different approaches.

CONCLUSION

The results of the research showed that 1) the long jump hang style learning model with the problem-based learning approach in the form of syllabus, lesson plans, worksheets, and evaluation instruments respectively fulfilled the category of "very valid", 2) The learning tools also fulfilled the category of "very practical", 3) The passing rate of learning outcomes reached more than 75% in X class of APHP 1 and 80.65% in APL class X 1. The students' attitudes towards physical education learning obtained the high minimum category of more than 80%, namely for X class of APHP 1 and 90.32% for class X APL 1. Thus, the device can be declared as effective based on the learning outcomes and attitudes towards physical education learning.

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