Development of JONES Game Modifications to Improve the Physical Fitness of Class V Elementary School Students

Wulyo Sigit Nawawi¹, Nanik Indahwati², Heryanto Nur Muhammad³

¹,²,³Physical Education, Faculty of Sport and Health, State University of Surabaya, East Java, Indonesia

wulyo.21021@mhs.unes.ac.id¹, nanikindahwati@unesa.ac.id², heryantomuhammad@unesa.ac.id³

ABSTRACT
This research in modifying the JONES game aims to 1) improve the physical fitness of class V students, 2) determine the effectiveness of modifications to the JONES game, and 3) improve physical fitness in class V elementary schools. This research uses descriptive analysis techniques in managing data, and data collection in the research uses student response anchors and validation sheets. The modification of the JONES game results in the effectiveness of the JONES game modification is based on: 1) the results of material expert validation tests with good criteria, 2) the results of media expert validation tests with good criteria, 3) the results of product trials and use trials with good criteria, 4) questionnaire results Student responses have good criteria.

INTRODUCTION
Several factors influence achieving success in sports and health sports, including Teachers, students, facilities, infrastructure, and curriculum. The existence of physical education and health education in schools shows that sports are a part of education that needs to improve the quality of human resources to build physical and spiritual health, improve discipline and sportsmanship, and achieve sports success (Atwi & Firdaus, 2020). Through this learning, attitudes, and awareness are created for each individual to improve their physical condition. Physical fitness is needed by everyone to carry out daily activities or activities. Students' physical condition is required for all activities both inside and outside the school environment. Students are expected to...
maintain fitness through regular exercise and lifestyle considerations because the quality of excellent physical condition is expected to influence the quality of learning and students’ way of thinking. According to Anggita et al. (2018) Basically, students need sufficient physical activity to support children's growth and development. To improve the quality of movement education and explore the abilities of elementary school children, students' physical fitness is an important thing to pay attention to (Rohmah & Muhammad, 2021).

From observations made on class V students at SDN Randegan in Dawarbandong District, Mojokerto Regency. Problems that often arise during the sports learning process in class V students result in students' lack of active movement in the PJOK learning process. When carrying out physical fitness activities, students experience tiredness, laziness, lack of enthusiasm, and complain more often so that they cannot learn sports optimally. This results in physical fitness not being achieved. Therefore, this raises a problem in increasing the effectiveness of physical fitness learning for class V students at SDN Randegan.

From the description above, there needs to be development in learning that can increase students’ effectiveness in learning physical fitness and make cardiorespiratory training activities interesting. According to Lestari et al (2022), modifying games will improve students' physical fitness. The modification of the learning model through games is also supported by the high interest of students in games, this can be seen from the results of observations of students, during break times students tend to play by using various simple items around them. The development of a learning model through games also aims to make learning more enjoyable because it is presented interestingly so that it does not cause boredom when practicing in the field. To overcome this, it is necessary to develop basic movement learning through modified games in physical education and health sports learning in elementary schools. By developing modifications to the JONES game on students' physical fitness material, it is hoped that the learning process will run effectively and efficiently which can influence the learning outcomes of fifth-grade elementary school students.

**METHODS**

This research develops a modification of the JONES game on class V physical fitness material which is expected to increase the effectiveness of students' physical fitness learning by using modified R & D model development method procedures (Sugiyono, 2018). The development of the JONES game modification consists of 9 stages, namely 1) Potential Problems, 2) Collection, 3) Product Design, 4) Product Validation, 5) Design Improvement, 6) Product Testing, 7) Design Revision, 8) Usage Testing, 9) Product Revision, 10) Mass Products. The steps for this development can be seen in **Figure 1**. Steps of Research and Product Development.
Learning Physical Fitness Through JONES Game Modifications. The modification of the JONES game in this research only extends to the product revision step, so that the results of the effectiveness of the modification of the JONES game developed are known. The validity of the JONES game modification developed in this research was obtained after going through a material and media expert validation phase, while the effectiveness of the JONES game model was obtained from usage tests and student response questionnaires (Laksana, 2022). Instruments for collecting data use questionnaires, validation sheets, and sheets. The data collection methods used were use tests and questionnaires.

RESULTS AND DISCUSSION
Results
Research can be carried out with the opportunity for complete school facilities at SDN Randegan in Dawarblangdong District, Mojokerto Regency to carry out physical fitness activities and the problem is that students are lazy, less enthusiastic, and often complain that they cannot do sports lessons optimally. The data collected by the researchers were questionnaires, pretest, and posttest results, and JONES game modifications. The research product design is made based on an assessment of the old product so that weaknesses in the product can be found. The results of the JONES game modification are as follows:

<table>
<thead>
<tr>
<th>No.</th>
<th>Game Type</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cone moving game</td>
<td>This game is a modification of the TKJI test, namely the 100m run which aims to measure speed. In the game of moving cones, students are expected to be able to increase their running speed by moving two cones 10m in turn to the next post.</td>
</tr>
<tr>
<td>2</td>
<td>Game push up</td>
<td>This game is a modification of the TKJI test, namely the bent elbow hanging test, the aim of which is to measure arm muscle strength. In this game, students do push-ups for 30 seconds to train or increase arm muscle strength.</td>
</tr>
<tr>
<td>No.</td>
<td>Game Type</td>
<td>Information</td>
</tr>
<tr>
<td>-----</td>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>3</td>
<td>Game modified sit-up</td>
<td>This game is a modification of the TKJI test, namely the sit-up movement which aims to measure the strength of the abdominal muscles. In this game, students perform a modified sit-up movement with their hands free for 30 seconds.</td>
</tr>
<tr>
<td>4</td>
<td>Jump rope game</td>
<td>This game is a modification of the TKJI test, namely the vertical jump which is used to measure the height of the jump. This game aims to increase leg muscle strength. In this game, students jump rope for 30 seconds to increase leg muscle strength.</td>
</tr>
<tr>
<td>5</td>
<td>4x10m Shuttle Run game with rolling wheels</td>
<td>This game is a modification of the TKJI test, namely the 600m run. This game aims to increase cardiovascular endurance when running, by covering a distance of 10 m between 2 parallel lines while rolling the wheel (tyre).</td>
</tr>
</tbody>
</table>

1) **Game Benefits**

The benefits obtained from the JONES game include:

a) **Physical Fitness**

In the JONES game, you can find out the physical fitness of students because this game is a modification of the TKJI test items.

b) **Physical Development**

The JONES game is a game that uses physical activity so the benefits obtained are that children can do physical activities that involve the strength of various organs of the child's body (physical fitness).

c) **Movement Development**

In the JONES game, children can practice movement skills, namely jumping, running, and balance.

2) **JONES Game Goals**

The objectives of the JONES game are as follows:

a) **Cognitive aspect**

(1) Students know and explain the rules of the JONES game.

(2) Students can mention the equipment, rules, and equipment used in the JONES game.

b) **Psychomotor side**

(1) Students can play the JONES game.

(2) Students can practice the movements of the JONES game.

c) **Affective side**

(1) Students can play the JONES game together.

(2) Students can play the JONES game well and athletically.

(3) Students can practice the JONES game together.

3) **Implementation and Preparation Steps**

Several steps that need to be taken before playing the JONES game are:
a. Preparation Phase

Things that need to be considered at the preparation stage include:

(1) Time availability. In this activity, you can use your time as best as possible because this activity is limited by class hours.

(2) Knowledge of student characteristics such as gender and number of participants. Prepare facilities and infrastructure, such as used motorbike wheels, rubber ropes, mattresses, and stopwatches.

b. Implementation Stage

The main aim of implementing this activity is so that children can experience a new learning model and get results from the game model by adding basic movements such as in the TKJI test component and increasing cohesiveness when interactions occur in groups to achieve the fastest finish, making learning as interesting as possible, so that students feel happy and interested.

4) Game Rules

The JONES game has certain rules, including:

a) Facilities and Equipment

(1) Field

The shape of the field is free but wide.

(2) Equipment

The equipment used in the JONES game is motorbike wheels, cones, rubber ropes, mats, and stopwatches.

b) Player Equipment

Wear a sports uniform.

(1) Wear socks.

(2) Wear sports shoes.

c) Number of Players

Players participating in the JONES game do not have certain (free) criteria that adjust the number of students in the class used as the research topic.

d) Game Length

The duration of the JONES game is approximately 5 minutes per participant.

5) Referee

In this game, the referee is the sports teacher.

a) JONES' game is controlled by a referee.

b) The referee has the authority to supervise the progress of the JONES game and determine which group is the winner.

6) How to play

a) This game is competitive

b) Students are divided into 2 groups.

   Post 1. Students move four cones 10m to post 2.
   Post 2. Students do push-ups for 1 minute (as best they can).
   Post 3. Students perform modified sit-ups with free hand movements for 1
minute (as much as possible).
Post 4. Students jump rope for 1 minute (as much as possible).
Post 5. Students roll the wheel (tyre) by covering a distance of 10 m between 2 parallel lines while rolling the wheel (tyre). The fastest group to reach the finish.

**Design Validation**

The design validation process was carried out to determine the feasibility of the JONES game modification product design. Validation results from experts, namely:

1. **Materials Expert**
   
   Aspects of indicators that will be assessed by material experts. This aims to determine the modification of the JONES game on the material used by researchers. The results of the material expert validation aspect are as follows:

   \[ 3.78 = \frac{72}{19} \]

   The material expert’s assessment obtained an average score of 3.78 out of a maximum score of 4.0, or in other words, the development of JONES game modifications had good criteria.

2. **Media Expert**

   Aspects of indicators that will be assessed by media experts. This aims to determine the modification of the JONES game on the media used by researchers. The results of the media expert validation aspect are as follows:

   \[ 3.84 = \frac{50}{13} \]

   The media expert assessment obtained an average score of 3.78 out of a maximum score of 4.0 in other words the development of JONES game modifications has good criteria.

**Design Improvements**

Based on the validation results of the JONES game modification product design, there were no improvements so the research stage continued at the product trial stage.

**Product Testing**

Based on the validation results from experts, the JONES game modification model product can be tested directly on small groups. This small group was carried out as a simulation of using the modified JONES game for class V students at SDN Randegagan, totaling 10 students. Product trials are carried out to obtain feasibility information before the use trial stage. Product trial results are as follows:

**Table 2.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Average</th>
<th>Post 1</th>
<th>Post 2</th>
<th>Post 3</th>
<th>Post 4</th>
<th>Post 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Before</td>
<td>1,786</td>
<td>27.5</td>
<td>26.1</td>
<td>35.9</td>
<td>6,985</td>
</tr>
<tr>
<td>2</td>
<td>After</td>
<td>1,519</td>
<td>29.6</td>
<td>28.7</td>
<td>37.3</td>
<td>6,362</td>
</tr>
<tr>
<td></td>
<td>Different power</td>
<td>0.267</td>
<td>1.9</td>
<td>2.6</td>
<td>1.4</td>
<td>0.623</td>
</tr>
</tbody>
</table>

**Information** Faster More More More Faster
Based on Table 2, research on product trials has obtained effective results, in other words, it can be continued to the use trial stage.

**Design Improvements**

Based on the validation of material experts, media experts, and trials using JONES learning modifications there were no improvements, so the research continued to the trial use stage.

**Trial Use**

After successful product trials, the modified product was applied to a large group of 32 students. The results of the trial use before and after using the JONES game modification are described in Table 3:

<table>
<thead>
<tr>
<th>No.</th>
<th>Average</th>
<th>Post 1</th>
<th>Post 2</th>
<th>Post 3</th>
<th>Post 4</th>
<th>Post 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Before</td>
<td>2.03</td>
<td>26.2</td>
<td>27.0</td>
<td>30.1</td>
<td>8.27</td>
</tr>
<tr>
<td>2</td>
<td>After</td>
<td>1.67</td>
<td>28.9</td>
<td>29.2</td>
<td>32.5</td>
<td>7.65</td>
</tr>
</tbody>
</table>

**Table 3.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Average</th>
<th>Post 1</th>
<th>Post 2</th>
<th>Post 3</th>
<th>Post 4</th>
<th>Post 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Before</td>
<td>2.03</td>
<td>26.2</td>
<td>27.0</td>
<td>30.1</td>
<td>8.27</td>
</tr>
<tr>
<td>2</td>
<td>After</td>
<td>1.67</td>
<td>28.9</td>
<td>29.2</td>
<td>32.5</td>
<td>7.65</td>
</tr>
</tbody>
</table>

Based on Table 3, this research has good differences, therefore the modification of the JONES game can be applied to physical fitness material. The student response questionnaire to the JONES game modification obtained an average score of 4.3 out of a maximum score of 5.0 or the development of the JONES game modification had good criteria for student responses after using the JONES game modification. The researcher carried out a paired sample t-test or comparison test, which aims to find out whether there is a difference in the average of two samples (pre-test and post-test) that are paired or related. The results of the paired sample t-test are as follows:

**Tabel. 4**

<table>
<thead>
<tr>
<th>Unstandardized Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
</tr>
<tr>
<td>Normal Parameters</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Most Extreme Differences</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Test Statistic</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Based on Table 4.12, it is known that the Aslmp.Sig (2-tailed) significance value is 0.200 > 0.05, so according to the decision-making in the Kolmogorov-Smirnov normality test above, it can be concluded that the data is normally distributed. Thus, the assumption of normality in using the paired sample t-test has been fulfilled. The results of the paired sample t-test are as follows:
Table 5.
Output SPSS paired sample t-test

<table>
<thead>
<tr>
<th>Pair</th>
<th>Pre-Test</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-Test</td>
<td>18.7200</td>
<td>5</td>
<td>12.66661</td>
</tr>
<tr>
<td>1</td>
<td>Post-Test</td>
<td>20.7840</td>
<td>5</td>
<td>13.14171</td>
</tr>
</tbody>
</table>

Table 6.
Output SPSS paired sample t-test

<table>
<thead>
<tr>
<th>Pair</th>
<th>N</th>
<th>Correlation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>1.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 7.
Output SPSS paired sample t-test

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>95% Confidence Interval of the Difference</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Mean</td>
<td>Lower</td>
<td>Upper</td>
<td>T</td>
</tr>
<tr>
<td>Pre-Test &amp; Post-Test</td>
<td>-2.06400</td>
<td>.54395</td>
<td>.24326</td>
<td>-2.73940</td>
</tr>
</tbody>
</table>

Formulation of the problem:

H0 = There is no difference in the average between the pre-test and post-test results, which means there is no effect of using the JONES game modification on physical fitness material.

Ha = There is an average difference between the pre-test and post-test results, which means there is no effect of using the JONES game modification on physical fitness material.

According to Aminuddin & Mulyadi (2020), the decision-making guidelines in the paired sample t-test based on the significance value (Sig.) of the SPSS output results are as follows:

1) If the Sig. value (2-tailed) < 0.005, then H0 is rejected and Ha is accepted
2) If the Sig. value (2-tailed) > 0.005, then H0 is accepted and Ha is rejected

Based on Table 4.15, it is known that the Sig. value (2-tailed) is 0.001 < 0.005, then H0 is rejected and Ha is accepted. So it can be concluded that there is an average difference between the pre-test and post-test results. Which can be interpreted as influencing the use of JONES game modifications.

Discussion

This research aims to make the learning process run effectively and efficiently and can influence the learning outcomes of class V students. According to Sugiyono (2018), the stages in this development, modified by researchers, consist of nine stages: 1) Potential Problems, 2) Collection, 3) Product Design, 4) Product Validation, 5) Design Improvement, 6) Product Testing, 7) Design Revision, 8) Usage Testing, 9) Product Revision.
Validation Material experts and media experts fill out a validation sheet consisting of nineteen items. The validator fills out the questionnaire in each assessment column with a Likert scale of 1, 2, 3, or 4 for each question item by circling according to the expert’s assessment.

The material expert validation questionnaire showed an average value of 3.78 and was included in the good criteria. The material expert concluded that the development of the JONES game modification was said to be suitable for use.

The material expert validation questionnaire showed an average value of 3.84, which is included in the good criteria. Media experts concluded that the development of the JONES game modification was said to be suitable for use.

The student response questionnaire showed an average score of 3.5, which is included in the good criteria. So that the efficiency of developing JONES game modifications can be used for class V.

At the trial stage of use, there were differences before and after using the JONES game modification. This is based on the different powers before and after using the JONES game modification. This is in line with the research results of Lestari et al (2022). According to the paired sample t-test, the Sig value (2-tailed) is known to be 0.001 < 0.005, so H0 is rejected and Ha is accepted. So it can be concluded that there is an average difference between the pre-test and post-test results. Which can be interpreted as influencing the use of JONES game modifications. In other words, the modification of the JONES game can improve the physical fitness of fifth-grade elementary school students.

Based on the results of research conducted by Bile et al (2021) and validation results from media experts, materials, and usage tests, it can be concluded that the modification of the JONES game makes the learning process run effectively and efficiently and can influence the learning outcomes of class V students.

CONCLUSION

Based on the research that has been carried out, it can be concluded as follows:
1. This research aims to make the learning process run effectively and efficiently and can influence the learning outcomes of class V students. According to Sugiyono (2018), the stages in this development, modified by researchers, consist of nine stages: 1) Potential Problems, 2) Collection, 3) Product Design, 4) Product Validation, 5) Design Improvement, 6) Product Trial, 7) Design Revision, 8) Usage Trial, 9) Product Revision.

2. The results of the development of this JONES game modification are:
   a. The results of the development of the JONES game modification carried out by media experts show that the average value is 3.84 and material experts show that the average value is 3.78. Based on the results of the expert assessment, the JONES game modification was declared suitable for use.
   b. The results of the development of the JONES game modification. The student response questionnaire shows an average score of 3.5, which is included in the
good criteria. So that it can make learning efficient and effective for class V elementary schools.

c. At the trial stage of use, there were differences before and after using the JONES game modification. This is based on the different power before and after using the JONES game modification and the paired sample t test before and after states that there is an effect of using the JONES game modification.

After developing the JONES game modification, there are still shortcomings that need to be developed again. This makes the researcher's suggestions for further research, the researchers' suggestions are as follows:

1. The researcher has not been able to create a module to develop the JONES game modification, so it is recommended that further researchers develop a JONES game modification module.
2. The development of the JONES game modification developed by the researcher only reached the stage of trialing use and measuring student responses, so it is recommended that further researchers be able to measure student learning motivation.

REFERENCES


