Game Model to Improve the Motor Abilities of Primary School Students

Tuswan[1], Hari Yuliarto[2], Sri Mawarti[3], Anastasia Erlina L.[4], Sb.Pranatahadi[5], Hadwi Prihantanta[6], Margono[7]

[1,2] Faculty of Sport Health, Universitas Negeri Yogyakarta
[3,4,5,6,7] Faculty of Vocational, Universitas Negeri Yogyakarta

ABSTRACT: This research aims to produce a learning model to improve children's motor skills through traditional games which are prepared based on the curriculum and characteristics of elementary school students. Research development procedures use Research and Development. The results of the development research obtained five game models, namely: bicycle wheel racing, rubber band throwing, rubber band unclang, mineral water bottle toss, and bicycle wheel rim target balls which were arranged in the form of a guidebook. The manual for motor skills game models for elementary school students was declared suitable for use based on the assessment of material experts and elementary school teachers. The results of the experts' assessments are as follows: 1) the bicycle wheel racing game is included in the "very good" category with an average rating of 4.8, which means X > 4.2; 2) the mineral water bottle gandon game is included in the "very good" category with an average rating of 4.9, which means X > 4.2; 3) the rubber band throwing game is included in the "very good" criteria with a mean rating of 4.86, which means X > 4.2; 4) the rubber band unclang game is included in the "very good" criteria with a mean rating of 4.9, which means X > 4.2; and 5) the bicycle wheel target ball game is included in the "very good" criteria with an average rating of 4.9, which means X > 4.2

KEYWORDS: game model, motor skills, elementary school students

I. INTRODUCTION

Growth and development is a dynamic process throughout human life that is carried out in stages, where one phase becomes the basis for development in the next phase. Growth can be interpreted as an increase in size, such as height and weight and can be measured quantitatively using kilo grams or centimeters. Human growth is greatly influenced by inherited genetic factors and begins from the conception phase, namely from the moment the egg cell meets sperm. However, the potential for growth depends on the nature and patterns of growth and development which are influenced by the environment, especially during childhood and adolescence. For this reason, parenting styles for children must be implemented appropriately because they can affect the child's growth and development. Therefore, inappropriate parenting patterns can result in malnutrition, physical abuse of children, and exploitation of children. (Rahmatika, 2021; J Suteja, 2019).

Growth and development are two things that cannot be separated and are interrelated biological processes. Growth is a condition for development to occur, because it can stimulate development by increasing the number of cells or tissues. Without growth, changes in the shape, structure, or function of cells or organisms are impossible. On the other hand, development is the result of growth which can result in differentiation, specialization, integration, or regeneration in cells or organisms. Because proper development will improve body functions and complex skills, thereby helping to bring about qualitative changes, namely, in the form of psychosocial, cognitive, moral, and motor function changes. (Bisri, 2015).

In general, motor skills are body movement abilities whose development is influenced by the child's age and overall development. Human motor development is divided into two types, namely fine and gross motor development. The development of gross motor skills involves the large muscles in the arms, legs and trunk. Fine motor skills refer to the ability to coordinate small muscles in hand, finger and eye movements. Gross motor skills generally develop earlier than fine motor skills. However, gross motor skills also form the basis for fine motor skills and are related to body awareness, balance, strength and reaction speed. Thus, gross motor skills and motor skills must be trained, because they really support the child's development process to increase physical maturity and development of the nervous system that supports body movement (U.Hasanah, 2016).

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Elementary school age children are called middle childhood and are the mature age for children to learn. Because during middle childhood, children have a high desire to master new skills given by teachers at school. This is also one of the initial signs of a change in the child's attitude towards the family, namely that it is no longer egocentric but objective and empirical (M Limbong, 2020). This means that in middle childhood, children already have an intellectual attitude so that this period is called the intellectual period states that the elementary school age period is also often referred to as the intellectual period or harmony period where children are easier to educate than the previous and subsequent periods. For this reason, learning at the elementary school stage must be carried out appropriately, where the development of children's intelligence is in line with the maturity of their motor skills (Lara Fridani, 2009).

Elementary school students are a period where various changes occur in growth and development which will influence the formation of children's characteristics and personalities. The elementary school age period can be used as a core experience for children who are considered to be able to take responsibility for their own behavior in relationships with peers, parents and others. Apart from that, elementary school age is a time when children gain the basic knowledge in determining success in adapting to adult life and acquiring certain skills (Diyantini, et.al.2015). For this reason, learning in elementary schools must be adapted to the characteristics of students and developments in science and technology. In this way, students always have the opportunity to be creative with their abilities and do not experience boredom during learning (Lara Fridani, 2009).

Education is the process of changing the attitudes and behavior of a person or group of people to mature humans through learning and training efforts (Warniti, 2014). Education has a very important and strategic role in life in a global era full of change, competition and complexity. Education that is implemented from childhood will have a positive impact in efforts to shape character and personality as well as the sustainable development and improvement of human resources. For this reason, education must start from elementary school because success in attending secondary school and college is greatly influenced by success in attending basic education. Apart from that, through basic education, students will be equipped with basic abilities related to the ability to think critically, read, write, count and master basic skills for studying science and technology as well as the ability to communicate which is a minimum ability requirement in social life (Muhammad Ali, 2009).

Technically, elementary school education can be defined as the process of guiding, teaching and training students aged between 6-13 years to have basic abilities in intellectual, social and personal aspects that are integrated and in accordance with their developmental characteristics. Thus, elementary school education can be said to be in the concrete operational phase, where students have demonstrated the ability in the thinking process to operate logical rules, even though they are still tied to concrete objects (Siti, 2017). This means that elementary school students are also able to understand how to combine several groups of objects at varying levels, and are able to think systematically about concrete objects and events(Abidin, 2016).

The development of science and technology does not always have a positive influence on education in Indonesia, especially on physical education subjects in elementary schools. The negative impact of technological developments can be seen by the large number of elementary school students who are lazy about moving and tend to play with cellphones. As a result, the child's tendency to move is minimal, resulting in motor skills not being able to develop in accordance with the child's growth and development. Facing this phenomenon, there is a need for physical education learning innovations that can trigger elementary school students to get opportunities to carry out movement activities. Through physical education, it is hoped that it can help build the development of attitudes, skills, knowledge, creativity and character education so that students can adapt to their surrounding environment (Ritonga & Sutapa, 2020; Kaimuddin, 2018).

Physical education is basically an integral part of the overall education system which aims to develop aspects of health, physical fitness, critical thinking skills, emotional stability, and others. Physical education can also be used as a medium to encourage the development of motor skills, physical abilities and knowledge. Apart from that, through physical education students will acquire various expressions that are closely related to pleasant personal messages. The results of observations show that physical education learning implemented in elementary schools in the Special Region of Yogyakarta has the same tendency at every level of education. Most teachers and coaches prioritize the competitive aspect compared to the development aspect of students' motor perception. Apart from that, the tendency to implement classical and holistic learning is still considered a truth that must always be applied. As a result, learning materials applied to lower class and upper class students always use the same methods and models. Physical education in schools is often seen as a movement activity that only causes fatigue. Apart from that, physical education is often considered a learning process that is only a psychomotor aspect, and is not taken into account by parents. If this situation continues, then one day the Special Region of Yogyakarta will lack potential children who will become outstanding athletes in the future. For this reason, it is necessary to develop learning models that can foster a sense of enjoyment and improve the motor skills of elementary school students, especially in the Special Region of Yogyakarta, because the model is a conceptual framework used as a guide for carrying out activities(Sagala, 2012). Using the right model will make it easier for elementary school students to understand each material provided systematically (Metzler, 2014).

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Basically, elementary school students can be said to be playing. This means that every time is filled with activities carried out with inner freedom to gain pleasure so that children can express all forms of behavior that are enjoyable and without coercion in accordance with the statement that playing games that are fun, inclusive and skill-based will help prepare children to participate in a wide variety of physical activities with greater success and enjoyment. Thus fun, inclusive, and skill-based play will help children prepare to participate in a variety of physical activities successfully and happily (Yusuf, 2014; Rohmah, 2016, Louise 2015. Apart from that, playing is a means and medium for children to learn movement, learn about their bodies, and form their personalities (Trianto, 2013; Gallahue & Ozmun, 2013; Pratisti, 2008).

The elementary school curriculum states that physical education is an educational process that utilizes physical activity and is planned systematically with the aim of improving individuals organically, neuromuscular, perceptually, cognitively, socially and emotionally. Meanwhile, the concept of play is a means of socialization which is expected to provide children with opportunities to explore, discover, express feelings, be creative and learn in a fun way (Sujiono, 2012). Thus, the concept of play must be implemented in physical education learning, especially for elementary school children. Through play, it is hoped that it can trigger creativity, smarten the brain, overcome conflict, train empathy, hone the five senses, as a medium for therapy, and make discoveries (Montolalu et.al., 2013).

Traditional games are a culture that contains local wisdom values such as character education values which are important to be transformed to the younger generation. Globalization and advances in science and technology have had a significant impact on the reduced interest of elementary school students in traditional games, because they have been replaced by various digital games such as internet-based or online games on computers or mobile phones. As a result, children's motor development is disrupted and cannot be optimal. For this reason, there is a need for a learning model that can make children interested, feel happy, and of course must involve motor performance (Gallahue & Ozmun, 2013; Lara Fridani, 2009).

The development of a physical education learning model based on local wisdom through traditional games in the Special Region of Yogyakarta is one solution to overcome this problem. Therefore, the potential of traditional children's games in the Special Region of Yogyakarta opens up opportunities for education to look again at local potential, especially to improve the motor skills of elementary school students. Apart from that, the potential that exists in traditional games can be explored in more depth so that local cultural wisdom values can be derived in order to expose children to the onslaught of global culture. The traditional games of the Special Region of Yogyakarta which are expected to improve the motor skills of elementary school students are: a) bicycle wheel racing game; b) gandon game; c) rubber band throwing game; d) rubber band unclang game; and e) bicycle wheel target ball game. Through the game model, it is hoped that it can develop and improve the gross motor and fine motor skills of elementary school students and become a learning reference. The game model is made simply so that it can be practiced in all elementary schools without reducing the goals and objectives of the learning curriculum. Teachers only need to understand and apply the game model in the teaching and learning process (TS Qodr, 2020; M Afandi, 2013).

II. METHODS

This type of research uses research and development with steps adopted from Sugiyono (2010: 298), namely: potential and problems, data collection, product design, data validation, data validation, product trials, product revisions, usage trials, revisions product, and final product. The test subjects in the research were elementary school students in Yogyakarta City, Yogyakarta Special Region. The data collection process was carried out quantitatively and qualitatively. Qualitative data was obtained from: (1) the results of interviews with elementary school teachers; (2) field notes; (3) data on suggestions for improvements to the initial model draft and results of observer observations during product trials (small scale) and use trials (large scale). The quantitative data was obtained from: 1) assessment of the validation value scale, 2) assessment of the observation value scale of game implementation, and 3) assessment of the observation value scale of the feasibility of implementing development in the game. Data Collection Instruments through observation, interviews and questionnaires. The data analysis technique used in this research is quantitative and qualitative descriptive data analysis. Quantitative descriptive data analysis techniques are carried out through: (1) validation assessment results using material experts' rating scales on the game model draft before testing; (2) assessor data resulting from observers' observations of the game model; (3) data from observations regarding the feasibility of designing game facilities for the growth and development of elementary school students in the learning process

III. RESULTS & DISCUSSION

The preliminary study was carried out using observation and interview methods. Observations were carried out on elementary school teachers and students, both directly and indirectly. Based on observations made by researchers, the following data can be obtained: 1) there is no game model guidebook to improve the motor skills of elementary school students, 2) a game model

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guidebook to improve the motor skills of elementary school students is needed to make it easier for teachers to implement it in the process learning, and 3) Students are interested in knowing and learning games to improve motor skills.

Based on initial research conducted, there are still many students and teachers who have not utilized traditional games as an alternative physical learning method to improve the motor skills of elementary school students. Difficulty in finding references or sources related to effective and efficient models to apply to the learning process is an obstacle that has been faced by elementary school teachers. For this reason, there is a need for a learning model that is easy to understand and implement in the physical learning process in elementary schools. The steps taken in the process of developing the game model are as follows: 1) analysis of the objectives of developing the game model to improve the motor skills of elementary school students, 2) analysis of the characteristics of elementary school students, 3) reviewing the literature on game models for students elementary school, 4) determine the principles for developing game models to improve the motor skills of elementary school students, 5) determine the objectives, content and activity management strategies, and 6) prepare a draft model for developing game models to improve the motor skills of elementary school students.

The validation model in the research used five validators, namely: three material experts and two media experts. To validate the model using V-Aiken analysis. The results of the analysis show that all the items developed are valid in the medium category (V-Aiken ≤ 0.04 = Low, V-Aiken ≤ 0.08 = Medium, V-Aiken ≤ 0.1 = High). As for the reliability test, Cronbach's Alpha is used with the following analysis results:

Table 1. Reliability Results of Traditional Game Models for Developing Motor Skills in Elementary School Students

Cronbach's Alpha	N of Items
0,691	5

Table 1 shows that the data analysis using Cronbach's Alpha above is the result of the reliability of the game developed by researchers using Cronbach's Alpha, obtaining a value of 0.691, which means $\alpha > 0.60$. In this way, the game model developed by researchers can be said to be reliable.

Results of Small Scale Trials

The implementation of small-scale trials was carried out by elementary school teachers. A small-scale trial was carried out at Muhammadiyah Jogokariyan Elementary School with 15 children to serve as test subjects. Data from small-scale trials can be explained as follows:

1) The bicycle wheel racing game has an average score of 184 (94%) with an average of 4.7. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating is 4.7 for the quality of the bicycle wheel racing game. Included in the "very good" criteria because it falls within X > 4.2.
2) The rubber band throwing game has an average score of 184 (94%) with an average of 4.7. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating is 4.7 for the quality of the rubber band throwing game. Included in the "very good" criteria because it falls within X > 4.2.
3) The rubber band unclang game has an average score of 181 (92%) with a mean of 4.6. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating is 4.6 for the quality of the rubber band unclang game. Included in the "very good" criteria because it falls within X > 4.2.
4) The bicycle wheel target ball game had an average score of 186 (96%) with a mean of 4.8. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating is 4.8 for the quality of the bicycle wheel target ball game. Included in the "very good" criteria because it falls within X > 4.2.

Based on the results of the observer's assessment of model products that have been tested on a small scale, it shows that: the game model for developing motor skills is in accordance with the core competencies and basic competencies of elementary schools, the game model suits the characteristics of students, the game model attracts the attention of elementary school students, the game model can develop the gross and fine motor skills of elementary school students, the instructions in the game model are clear so they are easy to understand and carry out, the equipment used in the game is easy to obtain and safe for use

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by elementary school students. Based on the analysis of trials in small groups, it shows that the initial product meets the requirements for trials in large groups.

Results of Large-Scale Trials

The large-scale trial is the result of a follow-up to the game draft which was tested on a small scale and has been revised, to find out the quality of the game model for developing motor skills for elementary school students. Large-scale trials were carried out on 28 students from Muhammadiyah Jogokariyan Elementary School and Minggiran State Elementary School. In large-scale trials, data is obtained in the form of evaluations and recommendations from teaching teachers which will then be used as material for revision.

Table 2. Results of large-scale trials assessing the quality of bicycle wheel racing games

No	Appraised items	Scale				
		1	2	3	4	5
1.	The game model is in accordance with core competencies and basic competencies	0	0	0	0	4
2.	The model is appropriate to the characteristics of elementary school students	0	0	0	1	3
3.	Game models can attract students' attention	0	0	0	1	3
4.	Game models can develop gross motor skills	0	0	0	0	4
5.	Game models can develop fine motor skills	0	0	0	0	4
6.	Game instructions are clear and easy for teachers to understand	0	0	0	1	3
7.	The game instructions are clear and easy for the teacher to put into practice	0	0	0	0	4
8.	The security level of the model complies with security standards	0	0	0	0	4
9.	The security level of the tool complies with security standards	0	0	0	1	3
10.	The equipment needed is easy to obtain	0	0	0	1	3
11.	Equipment settings are clear	0	0	0	0	4
12.	Attractive equipment for students	0	0	0	2	2
13.	Equipment settings are easy for students to understand	0	0	0	1	3
Frequency		0	0	0	8	44
Number (scale x ∑frequency)					32	220
Total score		252				
Percentage		96%				
Average Score		4,8				
Criteria		Very good				

Table 2 shows that the bicycle wheel racing game has an average score of 252 (96%) with a mean of 4.8. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating of 4.8 for the quality of the bicycle wheel racing game is included in the "very good" criteria because it is included in X > 4.2.

Table 3. Results of Large-Scale Trials on Quality Assessment of the Mineral Water Bottle Gandon Game

No	Appraised items	Scale				
		1	2	3	4	5
1.	The game model is in accordance with core competencies and basic competencies	0	0	0	0	4
2.	The model is appropriate to the characteristics of elementary school students	0	0	0	0	4
3.	Game models can attract students' attention	0	0	0	1	3
4.	Game models can develop gross motor skills	0	0	0	0	4
5.	Game models can develop fine motor skills	0	0	0	0	4

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No		Scale 1	2	3	4	5
6.	Game instructions are clear and easy for teachers to understand	0	0	0	1	3
7.	The game instructions are clear and easy for the teacher to put into practice	0	0	0	0	4
8.	The security level of the model complies with security standards	0	0	0	1	3
9.	The security level of the tool complies with security standards	0	0	0	0	4
10.	The equipment needed is easy to obtain	0	0	0	1	3
11.	Equipment settings are clear	0	0	0	0	4
12.	Attractive equipment for students	0	0	0	0	4
13.	Equipment settings are easy for students to understand	0	0	0	1	3
Frequency		0	0	0	5	47
Number (scale x ∑frequency)					20	235
Total score		255				
Percentage		98%				
Average Score		4,9				
Criteria		Very good				

The mineral water bottle gandon game has an average score of 255 (98%) with an average of 4.9. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating of 4.9 for the mineral water bottle gandon game is included in the "very good" criteria because it is included in X > 4.2.

Table 4. Results of large-scale trials assessing the quality of the rubber band throwing game

No	Appraised items	Scale				
		1	2	3	4	5
1.	The game model is in accordance with core competencies and basic competencies	0	0	0	0	4
2.	The model is appropriate to the characteristics of elementary school students	0	0	0	0	4
3.	Game models can attract students' attention	0	0	0	1	3
4.	Game models can develop gross motor skills	0	0	0	0	4
5.	Game models can develop fine motor skills	0	0	0	1	3
6.	Game instructions are clear and easy for teachers to understand	0	0	0	0	4
7.	The game instructions are clear and easy for the teacher to put into practice	0	0	0	1	3
8.	The security level of the model complies with security standards	0	0	0	1	3
9.	The security level of the tool complies with security standards	0	0	0	0	4
10.	The equipment needed is easy to obtain	0	0	0	2	2
11.	Equipment settings are clear	0	0	0	0	4
12.	Attractive equipment for students	0	0	0	0	4
13.	Equipment settings are easy for students to understand	0	0	0	1	3
Frequency		0	0	0	7	45
Number (scale x ∑frequency)					28	225
Total score		253				
Percentage		97%				
Average Score		4,86				
Criteria		Very good				

The rubber band throwing game has an average score of 253 (97%) with a mean of 4.86. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table

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to qualitative data on a scale of 5, the average rating of 4.86 for the rubber band throwing game is included in the "very good" criteria because it is included in X > 4.2.

Table 5. Results of Large-Scale Trials on Quality Assessment of the Rubber Band Unclang Game

No	Appraised items	Scale				
		1	2	3	4	5
1.	The game model is in accordance with core competencies and basic competencies	0	0	0	0	4
2.	The model is appropriate to the characteristics of elementary school students	0	0	0	0	4
3.	Game models can attract students' attention	0	0	0	0	4
4.	Game models can develop gross motor skills	0	0	0	0	4
5.	Game models can develop fine motor skills	0	0	0	1	3
6.	Game instructions are clear and easy for teachers to understand	0	0	0	1	3
7.	The game instructions are clear and easy for the teacher to put into practice	0	0	0	0	4
8.	The security level of the model complies with security standards	0	0	0	0	4
9.	The security level of the tool complies with security standards	0	0	0	1	3
10.	The equipment needed is easy to obtain	0	0	0	1	3
11.	Equipment settings are clear	0	0	0	0	4
12.	Attractive equipment for students	0	0	0	0	4
13.	Equipment settings are easy for students to understand	0	0	0	1	3
Frequency		0	0	0	5	47
Number (scale x ∑frequency)					20	235
Total score		255				
Percentage		98%				
Average Score		4,9				
Criteria		Very good				

The rubber band unclang game has an average score of 255 (98%) with a mean of 4.9. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating of 4.9 for the rubber band unclang game is included in the "very good" criteria because it is included in X > 4.2.

Table 6. Results of large-scale trials assessing the quality of bicycle wheel target ball games

No	Appraised items	Scale				
		1	2	3	4	5
1.	The game model is in accordance with core competencies and basic competencies	0	0	0	0	4
2.	The model is appropriate to the characteristics of elementary school students	0	0	0	0	4
3.	Game models can attract students' attention	0	0	0	1	3
4.	Game models can develop gross motor skills	0	0	0	0	4
5.	Game models can develop fine motor skills	0	0	0	0	4
6.	Game instructions are clear and easy for teachers to understand	0	0	0	0	4
7.	The game instructions are clear and easy for the teacher to put into practice	0	0	0	1	3
8.	The security level of the model complies with security standards	0	0	0	0	4
9.	The security level of the tool complies with security standards	0	0	0	0	4
10.	The equipment needed is easy to obtain	0	0	0	1	4
11.	Equipment settings are clear	0	0	0	0	4
12.	Attractive equipment for students	0	0	0	0	4
13.	Equipment settings are easy for students to understand	0	0	0	1	3
Frequency		0	0	0	4	48

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Number (scale x ∑frequency)				16	240
Total score	256				
Percentage	98%				
Average Score	4,9				
Criteria	Very Good				

The bicycle wheel target ball game had an average score of 256 (98%) with an average of 4.9. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating of 4.9 for the bicycle wheel target ball game is included in the "very good" criteria because it is included in X > 4.2.

CONCLUSION

Based on the results of research and development of a book on developing motor skills game models for elementary school students, it can be concluded that the Motor Skills Game Model for Elementary School Students includes 5 types of games, namely: bicycle wheel racing game, mineral water bottle gandon game, rubber band throwing game, game unclanging rubber bands, and a bicycle wheel target ball game based on the results of analysis in large-scale trials shows that the final product can be said to be feasible and can be a reference in learning for elementary school teachers in improving motor skills.

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