



Development of physical activity games in improving the physical motor ability of children aged 10-11 years at the elementary school level

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Abstract: The purpose of this study was to develop physical activity games to improve the physical motor ability of children aged 10-11 years at the elementary school level. Using research and development/R&D methods. Data collection techniques through questionnaires/questions given to experts and students, the data analysis technique used in this study is quantitative percentages. Validated by material experts, game experts, and language experts. The percentage of product design validation by experts is 80%, based on the information in the expert validation assessment table, the average value is in the range of 80%-100% valid meaning is used. The percentage of small group trials by target or object is 73%, based on the information in the table of evaluation criteria for the implementation of trial activities, the average value is in the range of 65%-82%, with good classification means used. The percentage of product design validation by experts in small group trials is 90% based on the information in the expert validation assessment table, so the average value is in the range of 80%-100% valid information means used. The percentage of large group trials by target or object is 90%, based on the information in the table of criteria for assessing the implementation of trial activities, the average value is in the range of 83%-100% very good classification meaning used. After going through the repeated validation stages and comparing small group trials and large group trials, it can be concluded that the development of physical activity games in improving the physical motor skills of children aged 10-11 years at the elementary school level is said to be very good and valid meaning is used.

Keywords: game, physical motor ability.

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INTRODUCTION

Games are non-coercive activities carried out for personal or group satisfaction. The aim of games for children is more to help them get along with other children their age and develop their character. Apart from that, games can also add movement activities so that when they grow up they are more skilled at moving around in many games. Games are one of the main interactive factors of entertainment and are outstanding in stimulating social, creative, and sharing behavior (Ferric Limano & Pratikta Aditya Setiawan, 2019). The game begins in anticipation, in a creative, predatory, and pleasant tension (Sulasikin Sahdi Kadir & Siswantoyo, 2018). Game something used to play.

Play is activities carried out by children themselves, or through interactions with other people and objects around them, done with pleasure, of their own free will, full of imagination, using all the five senses and limbs (Siti Nur Hayati & Khamim Zarkasih Putro, 2021). Children's development can be helped by playing. When children play, they learn new things about the world around them. The development of fundamental motor skills is key to developing children's skills to engage in Physical activity and meet the current recommendations in terms of total physical activity (Duncan et al., 2022). It is important to choose a game that is appropriate for the child's development so that the child can easily understand the educational messages contained in the game (Nur Azizah & Yuli Kurniawati, 2013). In playing and playing activities, children are free to express themselves and do not experience any pressure. Playing activities and games can develop aspects of development, including language development, cognitive development, social-emotional development, and physical-motor development



(Samsiah, 2018). Playing is a form of activity that aims to get pleasure or pleasure which is done without being forced but voluntarily (Ibrahim Sembiring, 2019). Playing is a learning process, and without the child realizing it, he has acquired life skills (Anita Yus, 2013). Play is an activity that can be done with tools or without tools to educate, entertain, and develop children's imagination (Ade Holis, 2016). To play is to create and then to inhabit a distinctive world of one's own making (Thomas Henricks, 2008). Play is an active form of learning that unites the mind, body, and spirit (Lisa Witherspoon & John P. Manning, 2012). Playing is very important especially for young people because it can prepare their future. According to the anthropological study done by Gossio, play is a way for human to learn their world and culture (Dewa Putu Eskasasnanda, 2017). Play allows children to experiment with social experiences and simulate alternative emotional consequences (Isabela Granic et al., 2014).

Elementary school-age children naturally want play activities, but with advances in technology this is not an option at this time, they are more busy with less useful activities. Education is the first step to prepare students for their future roles through activities, prompts, and lessons. In addition, a school is a place where the learning process is formed. Meant in Law 20 of 2003 concerning education regulations, namely planned efforts to realize the spirit of learning through guidance so that students are serious and can increase their ability to train mentally, discipline, character, skills, ethics, and abilities needed individually or in groups.

Education is an experience possessed by humans in developing mindsets or ratios and developing character in that person. Education becomes an important role when its essence is as a potential that is present to renew, and influence human life in a better direction than before (Hendrik Ryan Puan Renna, 2022). Education is part of an effort to help humans gain a meaningful life, both individually and as a group. Education is a process of changing the attitude and behavior of a person or group of people to mature humans through experience and training. Basically education is teaching held in schools as formal educational institutions (Lukman Ali & Muhammadong, 2022). Education means efforts to develop innate abilities, both physical and psychological abilities, in harmony with the values, culture and norms that exist in society. Efforts to instill values and norms that are passed down to the next generation to be optimized and implemented in everyday life, making education a means of preserving life (Ahmad Zuhdi et al., 2021). Education is the most important one to be drawn attention, to because the goal of the education itself which creates the new generations to be ready born compete with others in global competition (Elysa Hartati, 2013). Education must promote a sentient reason that connects with life, so that they learn and think by experiencing (Celso Rodriguez Echenique, 2023). Education is needed by a nation to improve the quality of superior human resources. Education has an important role in building a quality society (Arsita Yunia Sarwono et al., 2020).

Physical education is one of the options for solving existing difficulties. Significance of physical activity and physical education in promoting a well-balanced lifestyle and enriching children's educational experiences (Cereda, 2023). Physical education has become compensation for stimulating, motivating children's motor needs. Physical education is an activity whose content is learning by prioritizing motion which nourishes the body and soul consciously through education to develop student progress and changes that are fresh, planned, characterized, thinking and enthusiastic. Physical education is a structure of a complete form of learning, focusing on the development of physical abilities, motor skills, the ability to involve awareness, self-control, social skills, good and bad deeds through physical activity.

Physical education is an important component of overall education. It aims to cultivate aspects of physical fitness, movement skills, critical thinking, social skills, reasoning, emotional stability, aspects of a healthy lifestyle, and the introduction of a clean environment through physical activity, sports, and selected health topics in a systematic manner (Sabaruddin Yunis Bangun, 2012). One of the subjects taught in elementary schools is physical education. Because learning is done through physical activity, physical education is different and unique compared to other types of education. The teacher is involved in implementing the physical education learning process. In physical education the teacher must pay close attention to various student learning factors, including aspects of growth and development of the child's psychological characteristics (Abdul Hakim Siregar & Fajar Sidik Siregar, 2021). A teaching method that incorporates physical activity into the curriculum is known as physical education. In the education system, it is organized regularly with the aim of developing and improving oneself as a living being, covering all muscles, responding to the environment, self-control and mentality in the education system. Physical education is a combination of lessons that must be taught in the form of a syllabus or

curriculum (Iqbal Risman & Argantos, 2022). The assessment technique for physical education subjects refers to three aspects of assessment, namely: intelligent, aware, and understanding learning is called the cognitive aspect, self-control, attitude, and behavior are called the affective, ability, orderly, structured, guided and educated aspects called the psychomotor aspect, as well as being able to obtain achievements that include maintenance and arrangement for the progress and physical development of students (Arief Teguh Prasetyo SP et al., 2021). Physical education helps students develop the knowledge, fitness level, motor skills, and personal and social skills to the obtained goal of a lifetime activity and health (Denro Macario & Nera Grace Macario, 2023). Physical education has a central role to develop a healthy life style of students (Gita Febria Friskawati et al., 2020). Physical education in schools guarantees that children have opportunities to be active during the school day. Quality physical education goes beyond providing activity opportunities and promises to provide children with opportunities to learn through meaningful and appropriate instruction (Guy Le Masurier & Charles B. Corbin, 2006). Physical education is a physical activity, which starts from seeing and doing a movement, through physical activity routinely adapting muscles and physiology (Syamsuramel, 2020). Researchers have demonstrated that physical activity is related to improved cognitive performance, and at least two avenues for physical activity in young children (free play and directed play or physical education) appear especially important (Tara A. Stevens et al., 2008).

In placing the position of physical education, it is also believed that the contribution of physical education will only be meaningful when the experiences of movement in physical education relate to the life process of a person as a whole in society. If the experience in physical education does not contribute to other educational experiences, then there must be mistakes in the implementation of the physical education program.

Gap previous research and development from the previous (Elva Wati, 2018) thesis with the title development of physical activity games in improving the physical motor abilities of children aged 5-6 years at preschool permata bunda bengkulu city. My body game, my home game, my laundry game, let's play imitating motion, and my favorite fruit game are games developed from the results of previous titles that focus on early childhood aged 5 to 6 years and focus on fine motor skills, a little gross motor skills. Previous research and development from the previous (Septadi Hanif Pambayu, 2021) with the title of developing a model of physical activity through simple games to increase the speed and agility of lower grade elementary school students. Game bentol, game lariubung, game esbara, game gebu, game bolnas are games that were developed from the results of previous previous titles that focused on the speed and agility of lower grade elementary school students.

Based on the results of observations made in September 2022 at the Subsidi Swakarya Elementary School, during sports class the teacher tested speed and agility tests in class V A of 30 students running zig-zag. The teacher explained that there were some children who still had difficulties in their motor skills. When running zig-zag head downwards, the body bends, when running the arms don't swing, and there are some children who are not enthusiastic. Researchers can conclude that of the 30 students at Subsidi Swakarya School in class V A, 66% of the children were not good at zig-zag running, 33% of the children were good.

The urgency of this research raises a research that has never been done, games are something that is used to play because playing is a very important part of the child's development process. Children get experience related to the physical environment, language, thinking, behaving, getting along, leading, cohesive, practicing patience, and focusing. Thus playing is one of the important things in achieving children's learning goals. The benefits of this research are for children, they can train locomotor, non-locomotor, manipulative movements, and add to the experience of movement.

The novelty of this research and development finding with the title development of physical activity games in improving the physical motor ability of children aged 10-11 years at the elementary school level. Snake game to defend the crown, active drinking game, water giving game, and balloon throwing game are games that were developed based on the novelty of research and development findings by focusing on elementary school-age children aged 10 to 11 years and focusing on gross motor skills and a little fine motor skills.

METHODS

The application of the approach uses a quantitative percentage approach, uses the Research and Development/R&D method, with Sugiyono's research and development procedures. (Sugiyono, 2015) argues that the development process goes through ten stages, namely: (1) potential and problem, (2) collection data, (3) design product, (4) validation design, (5) revision design, (6) trials product, (7) revision product, (8) trial usage, (9) revision product, (10) mass production. There are ten design steps in research and development according to Sugiyono as follows:

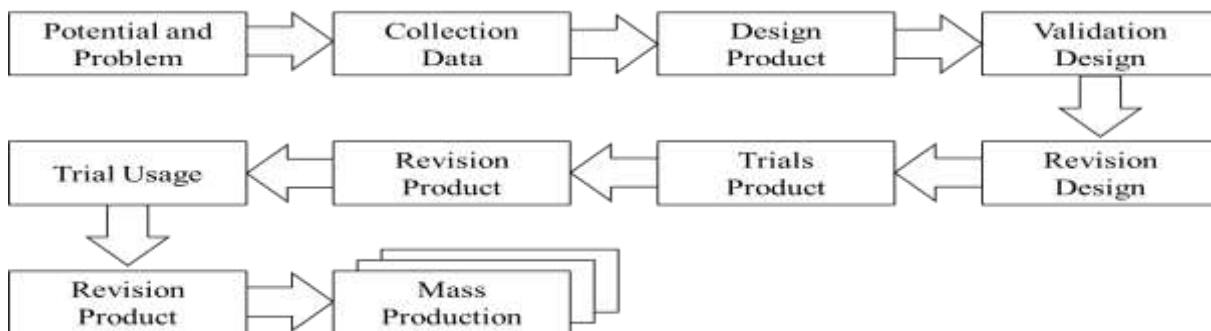


Figure 1. Method research and development

However, this research and development only uses eight steps, namely only up to trial use. It is based on research needs. The development of this game is not mass-produced, so the research and development steps that the researchers use only extend to trial use. The steps of the modified research and development design are as follows: (1) potential and problem, (2) collection data, (3) design product, (4) validation design, (5) revision design, (6) trials product, (7) revision product, (8) trial usage. From product improvement, data will be generated that will be analyzed, then the data is observed, compiled and discussed with the supervisor.

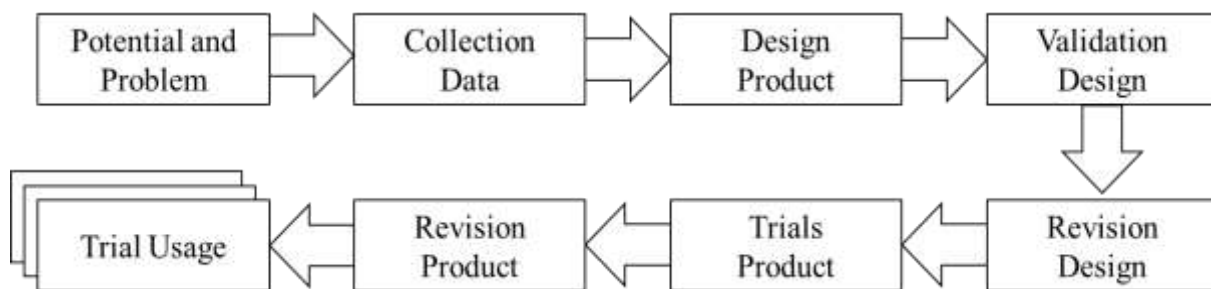


Figure 2. Method research and development

Data collection techniques used using questionnaires and questionnaires. Questionnaires and questionnaires used are questionnaires for students and questionnaires for experts. The questionnaire is used to capture the first data addressed to students. The questionnaire will examine matters related to the development of physical activity games in improving the physical motor skills of children aged 10-11 years at the elementary school level. Then, to get the second data, a questionnaire pointed out by the expert was used.

1. Questionnaire of Student Needs for Game Development

The data obtained from the questionnaire will be processed into development targets. The formula used is as follows:

$$Formula : Percentage = \frac{Number\ of\ Answers}{Number\ of\ Respondents} \times 100\%$$

Table 1. Criteria for assessment of the implementation of trial activities, (sudjana, 2005)

No	Classification	Category	Percentage	Meaning
1.	Very good	5	83%-100%	Used
2.	Good	4	65%-82%	Used
3.	Pretty good	3	47%-64%	Used (conditional)
4.	Not good	2	29%-46%	Repaired
5.	Very Not Good	1	<29%	Discarded

2. Game Development Assessment Questionnaire

This questionnaire will be given to experts. The formula used is as follows

Table 2. Trial analysis

Percentage	Information	Meaning
80%-100%	Valid	Used
60%-79%	Valid	Used
50%-59%	Not Enough valid	Not used
<50%	Invalid	Not used

Calculated with the formula:

$$P = \frac{\sum X}{\sum X_i} \times 100\%$$

Information:

P = Percentage

$\sum X$ = Number of Answers

$\sum X_i$ = Maximum Number Of Answers

RESULT AND DISCUSSION

This development research uses the Sugiyono procedure which carries out eight stages, namely potential and problem, collection data, design product, validation design, revision design, trials product, revision product, trial usage. The model developed in this research is development of physical activity games in improving the physical motor ability of children aged 10-11 years at the elementary school level. The physical activity game model designed by researchers: (1) snake game to defend the crown, (2) active drinking game, (3) water giving game, and (4) balloon throwing game.

The average percentage of product design validation by experts is 80%. Based on the information in the expert validation assessment table, the average value is in the range of 80%-100% that product design in the development of physical activity games in improving the physical motor skills of children aged 10-11 years at the elementary school level is a valid statement meaning used.

Table 3. Expert validation questionnaire results

No	Expert	Question Items										Point
		1	2	3	4	5	6	7	8	9	10	
1.	Material Expert	5	5	5	5	5	5	5	5	5	5	50
2.	Game Expert	4	4	4	4	4	4	4	4	4	4	40
3.	Linguist	3	3	3	3	3	3	3	3	3	3	30
	Points earned	Maximum points		Percentage		Information		Meaning				
	50	50		100%		Valid		Used				
	40	50		80%		Valid		Used				
	30	50		60%		Valid		Used				
	120	150		80%		Valid		Used				

The percentage value of small group trials by target or object is 73%. Based on the information in the table of criteria for evaluating the implementation of trial activities, the average value is in the range of 65%-82% that in the development of physical activity games in improving the physical motor skills of children aged 10-11 years at the elementary school level, this classification is good meaning used.

Table 4. Results of test answers in small groups of students

Question	Answer yes		Answer No	
	Number of Answers	%	Number of Answers	%
1.	24	80%	6	20%
2.	19	63%	11	37%
3.	24	80%	6	20%
4.	19	63%	11	37%
5.	24	80%	6	20%
6.	17	57%	13	43%
7.	24	80%	6	20%
8.	17	57%	13	43%
9.	25	83%	5	17%
10.	25	83%	5	17%
Number of Answers Yes = 218 218 : 300 X 100% = 72,67% = 73%			Number of Answers No = 82 82 : 300 X 100% = 27,33% = 27%	
Classification		Meaning	Classification	
Good		Used	Very Not Good Discarded	

The average percentage of product design validation by experts in small group trials is 90%. Based on the information in the expert validation assessment table, the average value is in the range of 80%-100% that the design of physical activity game development products in improving the physical motor skills of children aged 10-11 years at the elementary school level is a valid statement meaning used.

Table 5. Expert validation small group trial questionnaire results

Points earned	Maximum points	Percentage	Information	Meaning
50	50	100%	Valid	Used
40	50	80%	Valid	Used
45	50	90%	Valid	Used
135	150	90%	Valid	Used

The percentage value of large group trials by target or object is 90%. Based on the information in the table of evaluation criteria for the implementation of the trial activities, the average value is in the range of 83%-100% that in the development of physical activity games in improving the physical motor skills of children aged 10-11 years at the elementary school level, this classification is very good, meaning it is used.

Table 6. Results of Test Answers for Large Groups of Students

Question	Answer yes		Answer No	
	Number of Answers	%	Number of Answers	%
1.	58	97%	2	3%
2.	54	90%	6	10%
3.	58	97%	2	3%
4.	55	92%	5	8%
5.	53	88%	7	12%
6.	50	83%	10	17%
7.	55	92%	5	8%
8.	48	80%	12	20%
9.	48	80%	12	20%
10.	60	100%	-	0%

Number of answers Yes = 539		Number of answers No = 61	
539 : 600 X 100% = 89,83%		61 : 600 X 100% = 10,17%	
= 90%		= 10%	
Classification	Meaning	Classification	Meaning
Very good	Used	Very Not Good	Discarded

After going through a series of trials and revision processes, product development of physical activity games in improving the physical motor ability of children aged 10-11 years at the elementary school level theoretically and practically acceptable. The product being developed is designed in such a way that it is acceptable and qualifies as a test to measure development of physical activity games in improving the physical motor ability of children aged 10-11 years at the elementary school level. The preparation of this game also considers the ease with which children use tools and facilities.

Physical activity games are arranged in an interesting way using easy-to-find tools, simple movements are carried out to encourage children to participate in physical activity games. The creation of four games that were developed were: (1) snake game to defend the crown, (2) active drinking game, (3) water giving game, and (4) balloon throwing game.

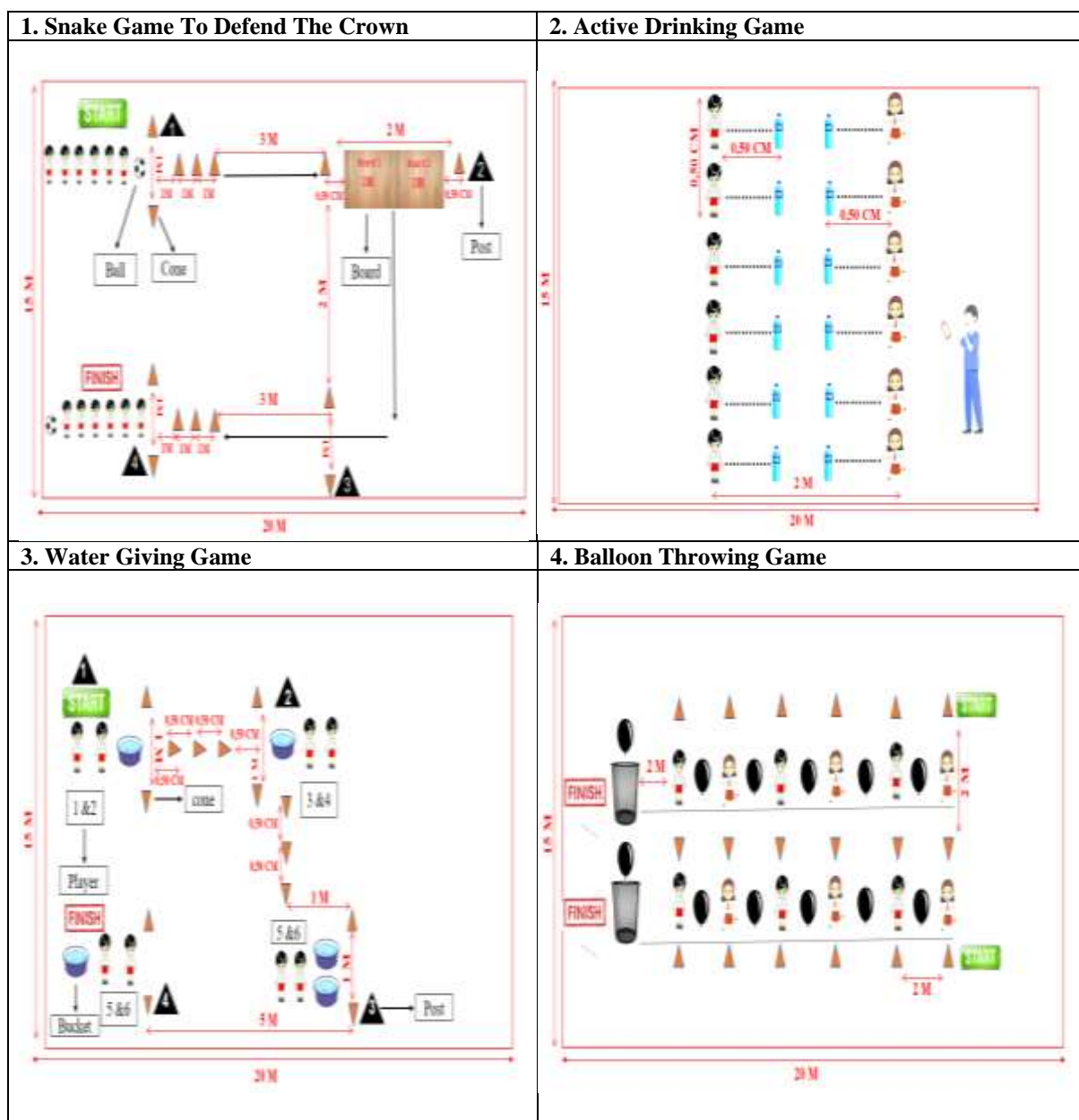


Figure 3. Four games

The game has goals and benefits, the purpose of the game is to hone physical skills, personality, communication, develop development in children, learn to practice patience, cohesiveness, and leadership, the benefits of games can train locomotor, non-locomotor, and manipulative movements in children, add to the experience of movement, and through this game they are expected to be able to take responsibility for the decisions they have made together.

The game is a means of developing aspects basic development of children, such as: physical-motoric, cognitive, social-emotional, and language (Gustian et al., 2019). From the aspect of fulfilling motion, in games there are many benefits that children get, including knowing body movements, body awareness, spatial awareness, quality of movement, and the relationship between movement abilities (Budiman et al., 2023). The ability subjectively determine the perception of success and failure in the context of physical education (Rohmansyah et al., 2022). Physical education also plays a role in the development of memory and concentration (Sumaryanti et al., 2022). States that in learning in the form of moving space activities and the ability to change direction are elements in perceptual motor states that the perceptual motor components include: body awareness, spatial awareness, directional awareness, and temporal awareness (Alim et al., 2021). Proper level of physical activity contributes to the development of healthy bone, muscle and joint tissues, systems healthy cardiovascular (Rahayu et al., 2021). Physical competence refers to an individual's ability to develop skills and movement patterns, and the capacity to experience a wide range of intensity and duration of movement. Enhanced physical competence allows one to participate in a variety of activities and physical settings (Sudarwo et al., 2023).

Cannot be separated from the findings of needs analysis and validation from a number of experts or experts. The validity of an instrument states the degree that indicates an instrument measures what will be measured. Validity includes content validity whose determination is based on the considerations of experts or experts (Ningrum & Sukoco, 2017). Techniques used by researchers to collect data using questionnaires and questionnaires. Questionnaires and questionnaires used are needs questionnaires and validation test questionnaires. The questionnaire was used to capture the first data aimed at students of the Subsidi Swakarya Elementary School, village defense road Laut Dendang.

The game was tried out in small groups with 30 students in the VA class and then gave a questionnaire. the results of small group trials of the classification "Good" meaning used with answers that games are fun and good for children, games make children think and move a lot, games are not boring and easy to do, and state the four games presented are worth playing.

The games were tried out in large groups with 60 students in VB and VC classes and then gave a questionnaire. The results of the large group test the classification "Very Good" means used with answers that games are fun and good for children, games make children think and move a lot, games are not boring and easy to do, and state that the four games presented are worth playing.

The questionnaire was used to capture the second data which was addressed to material, game and language experts. The following discussion can conclude the results of design validation and product trials.

a. Material Expert

The data generated from material expert product validation has the information "Valid" meaning used which means the development of physical activity games in improving the physical motor skills of children aged 10-11 years at the elementary school level is feasible to use, the data generated from material expert product trials has information "Valid" meaning is used which means the development of physical activity games in improving the physical motor skills of children aged 10-11 years at the elementary school level is feasible to use. Material experts help researchers to perfect the deficiencies that exist in research with comments and input in the form of revisions.

b. Game Expert

The data generated from game expert product validation has the description "Valid" meaning used which means the development of physical activity games in improving the physical motoric abilities of children aged 10-11 years at the elementary school level is feasible to use, the data generated from game expert product trials has information "Valid" meaning is used which means the development of physical activity games in improving the physical motor skills of children aged 10-11 years at the elementary school level is feasible to use. Game experts help researchers to perfect existing deficiencies in research with comments and input in the form of revisions.

c. Linguist

The data generated from the validation of the linguist's product has the information "Valid" meaning used which means the development of physical activity games in improving the physical motoric abilities of children aged 10-11 years at the elementary school level is feasible to use, the data generated from the linguist's product trial has information "Valid" meaning is used which means the development of physical activity games in improving the physical motor skills of children aged 10-11 years at the elementary school level is feasible to use. Linguists help researchers to perfect the deficiencies that exist in research with comments and input in the form of revisions.

CONCLUSION

So it can be concluded that this research and development produces products in the form of physical activity games in improving the physical motor skills of children aged 10-11 years at the elementary school level, producing four games, namely: snake game to defend the crown, active drinking game, water giving game, and balloon throwing game. So that the game is said to be very good and the meaning used is valid.

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