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The Effect of Learning Manipulative Skills Using Ball Throwing Learning Media on the Ability to Throw and Catch the Ball in Elementary School Students

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Abstract

This study aims to improve the ability to catch in children using the ball throwing learning media. The method used in this study was experimental using a one-group pretest-posttest design. The research was conducted using manipulative motion learning to catch the ball using the throwing media. To measure and find out the results of the data obtained by researchers using the statistical package for the social sciences (SPSS) software. The sample in this study was upper-grade elementary school students. Twenty students were chosen with a random sampling technique. This study's data collection technique using the instrument is a ball catch test. The data analysis technique used a t-test with a significance level of 0.05. This study concluded that there was a significant effect of learning outcomes using the ball throwing learning media on the ability to catch the ball of elementary school students.

Introduction

Physical education is a bridge for children in mastering the skills of a sport that is their specialty towards their highest achievement. Physical education is an educational process through physical activity that develops a person's physical, mental and emotional aspects as a whole (Gultom et al., 2021; Rahma & Kastrena, 2020), stating that improving physical health and sense of responsibility health in students, and getting used to a healthy way of life is very important. A healthy lifestyle can be habituated with physical education, sports, and school health activities. Physical education is an inseparable part of a general education because education can develop individual personalities. The educational process in schools will be paralyzed without physical education. The real contribution of physical education is to develop psychomotor skills. The position of physical education is unique because it has more opportunities than other subjects to develop skills. If other subjects are more concerned with intellectual development, reasoning, attitudes, and skills are also developed through physical education (Yuwono, Rahayu, Sulaiman, & Rustiadi, 2021). Education is a continuous process in human life. Physical education is an inseparable part of human life. Through physical education, humans can learn more about affective, cognitive, and psychomotor skills, which are human provisions to achieve better life goals. The influence of physical education is such that elementary school children's ability to carry out physical

activities develops their respective skills. Early age is a very decisive period for physical growth and development, and movement plays an important role in forming quality individuals in the future. Physical education taught in schools provides opportunities for students to be directly involved in various learning experiences through routine physical, sports, and health activities (Ritonga, 2022). Good physical education must improve children's basic movement principles and character values . Professional skills may comprise competence areas such as planning education, creating a learning environment, and managing learning. In that case, it seems clear that the professional beliefs of teachers or prospective teachers are related to their professional skills regarding the studies carried out in schools as stated.

Through physical education, children can carry out movement activities with their peers. Through activities carried out at school, children will grow and develop according to their time. One of the objectives of implementing physical education, sports, and health in elementary schools is to improve basic movement abilities and skills (Yuntoto, 2015). Doing motion activities will improve heart and lung fitness (Dewi, Supriadi, Hardinoto, & Gustira, 2020). Movement activities carried out by children should be activities that prioritize play activities. With the play approach, elementary school students will do activities happily because their games will make them happy to actively move (Verawati, Dewi, & Ritonga, 2021). Variations in playing can improve the basic movements of elementary school children (Verawati et al., 2021). Movement activities carried out by children will provide a very valuable experience for children. The experience gained will make an impression and shape the character and personality in his life in the future. If the experience gained by the child is in the form of a good experience, it will be a motivation for the child to live life the next day. If the experience obtained by the child is bad, then the experience can reduce motivation for the child. So that all the experiences gained, both good experiences and bad experiences, become a good motivation, then the role of the teacher can make it through physical education. Physical education Health and sports carried out for elementary school children support the growth and development of the movement in children. The growth and development of children's movements cannot be separated from the movement learning carried out by the children themselves. Movement learning carried out in schools will also improve basic movement skills in children. The basic movement skills possessed by children will be used as a foundation in learning basic technical skills in certain sports. Lemos, Avigo, and Barela (2012) explain that regular physical activity carried out by elementary school students will improve the gross motor development of elementary school students. The basic motor skills consist of basic locomotor, non-locomotor, and manipulation skills. Verawati and Dewi (2019) stated that basic movement skills in elementary schools could be divided into three types: locomotor, non-locomotor, and manipulation.

Basic locomotor movement skills are the ability to move from place to place, either moving from place to place by walking, jumping, crawling, or rolling. Non-locomotor movement skills are the ability to perform motion without moving from place to place, such as bending the arms, bending the legs, bending, and all movements that use joint space. At the same time, manipulative movement skills are the ability to move. Good motor development can bring changes in various aspects of life in children while increasing self-confidence in children (Restrepo Klinge, 2019). Motor skills in elementary school children are one of the most important aspects of their participation in physical education, sports, and health. The child's gross motor development will usually

see significance when the child has received movement learning that refers to manipulative movements (Lemos et al., 2012). Gross motor movements involve the activity of the hand muscles, leg muscles, and the child's entire body, and these movements rely on maturity in coordination, so that the various gross motor movements achieved by children are very useful for later life (Nur, Giyartini, & Sumardi, 2020). Physical education, sports, and health in schools elementary school children's motor skills can also be obtained through play activities outside of school in their spare time. As stated by Asnaldi (2019) with his research entitled *Contribution of Motor Ability and Concentration to the Ability of Word Mastery Heian Yodan Kateka Fatari Dojo Angkasa Lanud Padang*, motor skills are the basic capital for physical therapy needed in sports activities, and the activities can be learned in the early stages of development. Rismayanthi (2013) states that motor development changes in harmony with nerve and muscle maturity.

The result of a research study entitled *Contribution of Fundamental Movement Skills to Playing Skills in Small Sided Handball Games* is that fundamental movement skills have a significant correlation at a moderate level with playing skills (Fadilah & Wibowo, 2018). Manipulative motion is developed when the child is mastering various objects (Hidayat, 2017). Manipulative motion is playing certain objects or tools, for example, ball, racket, or bat (Savitri et al., 2020). According to Siregar, Damaiwaty, and Lubis (2019), manipulative motion is an activity carried out by the body with the help of tools. Meanwhile, according to Verawati and Dewi (2019), manipulative movement skills require coordination with space and objects around them or activities carried out by the body with the help of tools. Based on the opinion above, the manipulative motion has a very important role in learning physical education, especially in sports that require some forms of movement of the limbs more skillfully, such as football, volleyball, basketball, and baseball. Imani, Muslihin, and Elan (2020), in their research entitled *Ball Game on Children's Manipulative Movement Development*, state that games for children using ball media can improve children's basic manipulative movement skills. In another research study, it is stated that using simple learning aids can improve student learning outcomes of manipulative basic movement skills class II (Kustiawan, Prayoga, Wahyudi, & Utomo, 2019). Rahma and Kastrena (2020) in their research state that modified games as an alternative learning activity for children that can make a positive contribution to increasing children's manipulative movement abilities include: the ability to throw, catch, kick, roll and bounce the ball.

Manipulative basic movement abilities are activities carried out by limbs using an object, such as hitting, kicking, throwing, pushing, bouncing, receiving, catching, and stopping (Samsudin & Nugraha, 2015). With good manipulative abilities, children will participate in the game activities with their peers. In other words, the potential for manipulative basic movement skills of a child is very important to be developed more optimally if the child wants to have maximum motor development. As stated by Dewi and Verawati (2021), the research results showed an increase in basic motor skills of elementary school students through manipulative games. Rahma and Kastrena (2020) stated that the children's manipulative movement skills through bottle bowling games from cycle I to cycle III were good. The ability to catch is a basic movement skill always carried out in everyday human life. With good catching skills, a person will carry out daily life activities related to catching and holding objects well.

Obstacles Faced by High-Grade Students

Every child owns the potential for manipulative skills, but with different levels. This result is in line with what was stated by Rahma and Kastrena (2020) that essentially every child has the potential for manipulative skills but at varying levels. Furthermore, Rahma and Kastrena (2020) stated that problems in basic manipulative movement skills for children are usually marked by the absence of children's skills in movement activities that require manipulative skills.

Manipulative skills are needed in daily movement activities such as throwing, catching, hitting, and kicking. For example, in the basic manipulative motion of catching a ball, if a child has not been able to carry out the manipulative motion of catching a big rolling ball with both hands, he has not been able to catch a large ball that comes at stomach level using both hands properly. Therefore, it is necessary to learn the basic manipulative movements of catching a big ball which is done repeatedly and varied. In addition to being repeated and varied, a learning media can be used as a learning aid. Learning media that will be used other than learning can also increase students' motivation to follow the learning process itself. Media that can be used in the manipulative motion learning process to catch big balls can use simple learning media and complex media. Learning media that can be used to improve manipulative skills in catching balls in elementary school children can use the help of tools in the form of machines. The machine in question is a ball-throwing tool that serves to pass the ball to the child. Therefore, manipulative learning to catch big balls by using a ball throwing device for children is expected to improve basic manipulative movement skills to catch big balls in elementary school children.

Ball Thrower Learning Media

The working system of the learning media for the ball throwing device is throwing the ball according to the needs when the learning process is in progress. The ball throwing learning media can be adjusted for the height of the ball and the direction of the ball thrown either to the left or right. The learning media that uses this ball-throwing device is hoped to eliminate boredom for children in the learning process (Afandi, Chamalah, & Wardani, 2013). The learning media can improve student learning outcomes and make them more serious and enthusiastic in the learning process. The improvement of basic manipulative movement skills to catch the ball must have a movement learning process. Without the movement learning process, certainly, the mastery of basic manipulative movement skills to catch big balls in elementary school children will not increase. So that the process of learning the basic manipulative motion of catching the ball in elementary school children does not experience boredom, the researchers tried to use the ball throwing media in the process of learning activities. Swadesi and Kanca (2018) stated that the learning media for physical education, sports, and health in the big ball game is very good to use. So far, the teachers of physical education, sports, and health in learning basic manipulative movements of throwing a ball always give the ball to students one by one in turn. This situation can cause boredom in students when following the learning process of throwing the ball.

To eliminate the boredom that comes to students in the learning process, the teacher needs a learning media used in the learning process of manipulative throwing a big ball. Learning media that can be used in helping teachers

in the learning process of manipulative basic motion throwing a big ball is a ball throwing tool that the author has developed. Development research carried out in 2021, entitled the development of ball-throwing aids with the result that the developed ball-throwing tools can be used as training media. According to Heijnen et al. (2013) and Ericsson and Karlsson (2014), the ball throwing device can be used as a training aid (learning).

Method

The method used in this research is to use an experimental method with a one-group pretest-posttest research design. Before the researcher conducts the research, the researcher will give a pretest to the sample to know the initial ability of the sample before receiving treatment from the researcher. Before testing the hypothesis, the data was tested with a normality test and a homogeneity test using SPSS version 2.1. The trial was carried out through the stages of giving a pretest (pretest) to determine the initial abilities of elementary school students. In the initial test, treatment/stimulus to improve basic manipulative movement skills to catch big balls was given using media ball throwing lessons. The treatment trials were given in 2 meetings. After that, the final test (post-test) using Throw Catch Big Ball is conducted after being given basic manipulative learning to catch big balls.

There are two variables in this study: the independent and dependent variables. The independent variable in this study was the basic manipulative movement learning using the ball throwing learning media, while the dependent variable was the basic manipulative movement ability to catch a big ball. The instrument used to collect data is a tool to measure the ability to throw and catch a large ball. The data analysis used in this research includes descriptive data, requirement tests, and hypothesis tests. Descriptive data describes the analyzed data, which consists of the mean, amount of data, standard deviation, and percentage. After describing the description of the data, the researcher conducted a normality test to know whether the data was normal or not. Furthermore, the t-test is conducted to determine whether there is an effect after the researcher's treatment.

Results

After the researcher got the data, the researcher conducted an analysis. The analysis results will be presented in the form of Table 1.

Table 1. Data Description

Type of Test	Group	Test Mean	Difference	SD
<i>Pretest</i>	Throw Catch Big Ball	0.30	0.1	0.35
<i>Posttest</i>	Throw Catch Big Ball	0.29		0.32

Based on the average test results of the large-ball throwing and catching pretest group, it was 0.30. The big-ball throwing-catch post-test was 0.29 and had an average difference of 0.1. The normality test was carried out with the Lilliefors test on the research variables, namely, Exercise using a ball thrower (X) Reaction Speed (Y) can be seen in Table 2.

Table 2. Normality Test

Test	L count	L table
Pretest - Throw Catch Big Ball	0.1746	0.242
Posttest - Throw Catch Big Ball	0.1960	0.242

Based on Table 2, it is known that the data from the Pree-Test Catch the Big Ball after the calculation results in an L count of 0.1746 and an L table of 0.242. This result means that L count is smaller than L table. It can be concluded that the distribution of the data from the Pree-Test Big Ball Throw and Catch is normally distributed. For testing the data, the post-test Big Ball Catching result resulted in a Lcount of 0.1960, which was smaller than a Ltable of 0.242. So it can be concluded that the distribution of data from the Post-test Big Ball Catch results is normally distributed. Homogeneity test was conducted to determine whether the sample came from the same variance or homogeneous. The homogeneity test in this study used Levene statistics by testing the pretest and post-test data. The homogeneous results can be seen in Table 3.

Table 3. Homogeneity Test

Test	Significant	Description
Pretest - Throw Catch Big Ball	0.550	Normal
Posttest - Throw Catch Big Ball	0.547	Normal

Based on table 3, it is known that the results of the homogeneity test of learning using ball throwing media have a significance value of pretest and post-test > 0.05, which means that the data used is homogeneous. The description of the results of the research on reaction speed data in the pretest before the treatment and after the treatment (post-test) using the ball thrower learning media produces the following data: The learning outcomes data using the ball throwing media before the pretest is more dominant in the category low with a total of 15 students (75%) with a standard score range of 4-5, the very low category four students (20%) with a standard range of 1-3 scores, for the high category one student (5%) with a standard range score 6-7. While the scores after being given treatment (post-test), four students were in the very high category (20%) with a standard score range of 8-12, the high category was 14 students (70%) with a standard range of 6-7 scores and the low category was two students (10%) with a standard range of 4-5 scores. The results of the data (pretest) and data (post-test) can be seen in Table 4 and in Figure 1.

Table 4. Frequency Distribution of Pretest and Posttest Big Ball Catching Ability

Assessment	Score Standard	Frequency			
		Pretest		Posttest	
		Absolute (Fa)	Relative (%)	Absolute (Fa)	Relative (%)
Very High	8–12	0	0.00%	4	20.0%
High	6 – 7	1	5.0%	14	70.0%
Low	4 – 5	15	75.0%	2	10.0%
Very Low	1 – 3	4	20.0%	0	0.00%
Quantity		20	100%	20	100%

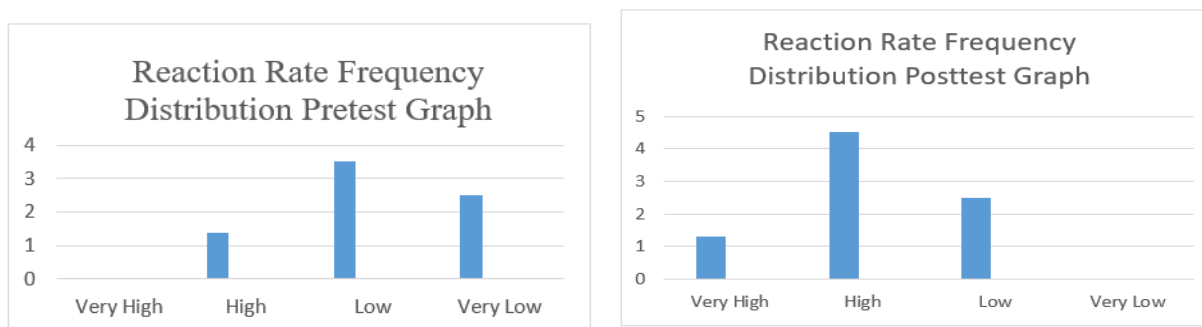


Figure 1. Pretest and Posttest Frequency Distribution Data on Ability to Catch Big Balls

Based on the influence test carried out to answer whether the proposed hypothesis is accepted or rejected using the t-test, the results of the ability to catch big balls with a tcount of 57.34 are then compared with ttable and then obtained d.b = (N-1) with a significant level of 5% of 1.679. From the results of the tcount and ttable calculations, it can be concluded that the results of the ball catching test with a tcount value of 57.34 > ttable 1.679, so the hypothesis shows that there is an effect of learning using ball throwing media on the ability to catch big balls in elementary school children with a percentage of 45.00 %. The results of the processed t-test values can be seen in Table 5.

Table 5. Processed Value Of Pretest And Post-Test t-Test Percentage Increase

Treatment	Description	t _{count}	d.b	t _{table}	Level	Percentage
					Significant	Improvement
Manipulative	Pretest	57.34	19	1.679	5%	45.00%.
Games	Posttest					

Discussion

Based on the results of the study, it was found that there was an increase in the manipulative ability to catch big balls in elementary school children. These results can be seen from before the treatment (pretest) and after the treatment (post-test) using tests and measurements of throwing and catching big balls. Research conducted by researchers supports these results, and the results of the analysis show that learning using a ball thrower can provide significant benefits for increasing physical performance (Ulfiansyah & Kriswantoro, 2015). Ulfa and Kamtini (2018) state that playing can be used as a medium to improve gross motor skills and certain abilities. In addition, as an activity carried out with or without tools that produce, provide information, provide pleasure, and develop children's imagination (Ritonga, 2022). Physical movement activities controlled by learning methods using play and tactical approaches can provide space and optimization to achieve learning objectives and improve the quality of student learning. Playing to improve children's physical motor skills, especially in basic manipulative movements for ages 4-5 years, can be carried out with various kinds and forms of games. For example, the ball game has been modified by many previous researchers to make the ball in the form of various

games. Imani et al. (2020) explained that elementary school-age children could develop manipulative skills are catching the ball, throwing the ball, and hitting the ball. Basic manipulative movement skills are very influential so that children achieve the role of manipulative development to the maximum (Dewi & Verawati, 2021).

Manipulative skills can improve the reasoning and development of smooth and gross muscles of elementary school children (Perwita & Indrawati, 2020). According to Sutini (2018), games using ball media do not require high-level skills and will allow all children to be involved in the game to respond to activities happily. This game can be used in groups or individually and then adjusted to the level of child development so that children can channel their energy and aspirations. Because using the ball media will help children in the learning process to develop various aspects, one of which is in the child's gross motor aspect. Using the media ball will encourage children to interact actively and engage with their physical environment. At the same time, on the other hand, children have the opportunity to enrich their movements such as movements with sensory motors, hands, feet, head, or other body parts that will involve the child's large muscles so that they can optimally develop their gross motor skills. Verawati and Dewi (2019) state that manipulative movement skills using games/big ball learning media aim to see empirical data regarding the effect of big ball games to improve the manipulative skills of elementary school students. Manipulative games through ball throwing learning media using large balls are used as a medium to stimulate children's manipulative development. At the beginning of the study, many children were not directed and needed guidance and training in the ball-throwing game to get optimal results. (Imani et al., 2020) explained that to improve manipulative skills in using the game of dribbling. Games using balls are felt to be necessary to improve elementary school children's manipulative skills. The ability to catch is a basic movement skill that is always carried out in everyday human life. With good catching skills, a person will be able to carry out daily life activities related to catching and holding objects well. Imani et al. (2020) explained that manipulative games using ball games improve gross motor skills. This part is interrelated with each other. When children make movements to catch the ball through the ball throwing learning media, it will improve the manipulative abilities of elementary school children because ball games use forms of movement in manipulative skills. (Imani et al., 2020) also explained that the effectiveness of playing catch the ball for gross motor development showed that catching the ball affected the gross motor skills of elementary school children. From the study results (Imani et al., 2020), it can be explained that the research conducted proved that the game of catching the ball through the ball throwing media showed significant results on gross motor skills. Ulfa and Kamtini (2018) state that playing activities to catch the ball positively affect children's gross motor development, such as catching movements from below, from above the head, or beyond the head and catching from the side. This research proves that this manipulative skill improves the child's ability to catch an object thrown through the learning media of a ball throwing device to improve the ability to catch a ball in elementary school children.

The potential for manipulative skills is owned by every child but at different levels. This finding is in line with what was stated by Rahma and Kastrena (2020) that essentially every child has the potential for manipulative skills but at varying levels. Furthermore, Moerianto, Valianto, and Dewi (2020) stated that problems in basic manipulative movement skills for children are usually characterized by the absence of children's skills in movement activities that require manipulative skills. Manipulative skills are needed in daily movement activities

such as throwing, catching, hitting, and kicking. For example, in the basic manipulative motion of catching a ball, if a child has not been able to carry out the manipulative motion of catching a big rolling ball with both hands, he has not been able to catch a large ball that comes at stomach level using both hands properly. Therefore, it is necessary to learn the basic manipulative movements of catching a big ball which is done repeatedly and varied. In addition, learning media can be used as a learning aid. Learning media also increases students' motivation to follow the learning process itself. Media that can be used in the manipulative motion learning process to catch big balls can use simple learning media and complex media. Learning media using a ball throwing device for elementary school children is a learning media that helps children in manipulative movement skills by catching the ball. Verawati and Dewi (2019) explained that developing manipulative skills for children could be through throwing and catching balls. The application of manipulative games through ball throwing learning media has many benefits making it easier for elementary school children to play it. Besides, the tools and facilities used are not too expensive and do not cost much because the game tools are easy to modify. The tools used only need imagination and creativity (Dewi et al., 2020). Furthermore, manipulative games involve many people, so the use of learning time is effective, besides involving many people (students) will cause students to be able to communicate with peers regarding the manipulative game model being carried out, the process of interaction through effective communication. What is done will form an attitude of togetherness, honesty, responsibility, sportsmanship, a spirit of competition, and obedience to the rules that are made (Fajrin, 2015). In addition, the application of manipulative games through the ball throwing learning media also has a positive impact on positive control of social skills, students' physical and motor skills, and control (Kovačević & Opić, 2014). The working system of the learning media for the ball throwing device is throwing the ball according to the needs when the learning process is in progress. This ball throwing learning media can be adjusted for the height of the thrown ball. It can even adjust the direction of the ball thrown either to the left or right. With learning media that uses this ball-throwing device, it is hoped to eliminate boredom for children in the learning process (Saputro & Susilo, 2019). The use of learning media can improve student learning outcomes, and students are more serious and more enthusiastic in the learning process. Furthermore, innovative and fun learning can provide a positive stimulus in student learning to encourage them to be actively engaged in physical education learning activities (Malik, 2013; Nur et al., 2019). Motor skills must be done from an early age because the development of elementary school students through physical education starts from the development of learning motion, especially manipulative movements (Clark, 2007). The movement of motor skills reflects a series of activities in sync with temporal and spatial coordination in simultaneous action. It is also an important skill in moving the body from one place to another and a manipulative tool and a basic form of advanced movement in certain sports skills (Abdullah et al., 2013). The improvement of basic manipulative movement skills to catch the ball must have a movement learning process. Without the movement learning process, certainly, the mastery of basic manipulative movement skills to catch big balls in elementary school children will not increase. So that the process of learning the basic manipulative motion of catching the ball in elementary school children does not experience boredom, the researchers tried to use the ball throwing media in the process of learning activities. Swadesi and Kanca (2018) stated that the learning media for physical education, sports, and health in the big ball game is very good to use. Movement learning through manipulative catching skills through ball throwing learning media is modified to help children master the

skills of catching elementary school children (Dewi & Verawati, 2021), improve the quality of movement, and improve cognitive abilities, fitness, psychological and mental health (Tandon et al., 2016).

It can be stated that manipulative skills are individual abilities in catching ball movements combined with ball throwing learning media as a learning tool for elementary school children. Then, elementary school students in upper grades can master the manipulative ability to catch big balls properly and correctly. Besides that, the manipulative movement of catching the ball through the ball throwing learning media can increase the reaction speed of elementary school students in terms of responding to a stimulus generated through the ball throwing learning media. Based on the results of the analysis carried out by the researchers, it can be proven that manipulative skills using the ball thrower learning media can improve the ability to catch big balls of elementary school students. The existence of these results is expected to make the ball throwing learning media can be applied to improve the ability of manipulative skills to catch the ball and can be used as a reference in learning the movement of manipulative skills properly and correctly.

The advantage of this research is that it can improve the ability of manipulative skills to catch the ball through the ball thrower learning media. In addition, the ball throwing tool, which is used as a learning medium to improve the ability of ball catching manipulative skills, makes learning more interesting because of the nature of the learning media, which refers to the use of technology-based learning media. Besides, the ball-throwing learning media is new among elementary school students, so elementary school students tend to keep trying to catch the ball from the ball thrower learning media. In addition, the ball-throwing learning media is the impact of educational technology that allows for learning that has summary patterns. Miftah (2014) explains that four patterns in learning media can be used as learning resources, namely as follows: 1) learning media are used as learning resources in the form of people as components of the main learning system, 2) learning resources/learning system components in the form of materials, tools, techniques, and environments that function through learning resources, 3) Learning resources/learning system components in the form of materials, tools, techniques, and the environment (which are combined into learning products or systems related to media learning) that interact with students (learners).) which share responsibilities with learning resources/learning system components in the form of people, 4) Learning resources/learning system components in the form of materials, tools, techniques, and the environment (which combines learning systems related to media learning) that interact with students (students) only, without any intervention or influence on from learning resources/learning system components in the form of people. The drawback in this study is that the use of ball throwing learning media is limited, so in carrying out manipulative learning to catch the ball, one has to wait and take turns in carrying it out.

Conclusion

The application of learning manipulative skills using the ball thrower learning media can improve the ball throwing skills of elementary school students. It is used for students before the treatment (pretest) and after the treatment (post-test) with indicators of skill assessment, catching, and throwing the ball. Learning manipulative skills using a ball throwing learning media are designed to be simple means that movement activities are by the

development of student movement, which refers to the characteristics of student development. In addition, learning manipulative skills using ball throwing learning media is carried out by prioritizing learning with a play approach to attract students' interest in carrying out manipulative skill movements properly and correctly. Therefore, researchers have recommendations to carry out further research more optimally: (1) teachers must be able to make innovative learning designs so that they can improve complex abilities and skills and can make or add combinations of learning media so that children do not feel bored; (2) it is better to conduct and combine meetings with fundamental motor skill movements so that they get maximum results.

Recommendations

Based on the results, this research is expected to be developed further to add scientific sources that have many innovations in choosing a manipulative skill learning model and using learning media that can be used as a basis in fulfilling references to the ability to throw and catch the ball. Then, the purpose of the process of the manipulative learning skills can be achieved properly and following the improvement of the fundamental motor skills of elementary school students.

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References

- Abdullah, B., Amri, S., Yee, K. L., & Samah, B. A. (2013). The impact of traditional games on the gross motor skill development of an early childhood. *Social Sciences (Pakistan)*, 8(6). <https://doi.org/10.3923/sscience.2013.590.595>
- Afandi, M., Chamalah, E., & Wardani, O. P. (2013). Model Dan Metode Pembelajaran Di Sekolah. *Perpustakaan Nasional Katalog Dalam Terbitan (KDT) (Vol. 392)*. <https://doi.org/10.1007/s00423-006-0143-4>
- Asnaldi, A. (2019). Kontribusi Motor Ability Dan Konsentrasi Terhadap Kemampuan Penguasaan Kata Heian Yodan Karateka Lemkari Dojo Angkasa Lanud Padang. *Jurnal MensSana*, 4(1), 17. <https://doi.org/10.24036/jm.v4i1.30>
- Clark, J. E. (2007). On the Problem of Motor Skill Development. *Journal of Physical Education, Recreation & Dance*, 78(5), 39–44. <https://doi.org/10.1080/07303084.2007.10598023>
- Dewi, R., Supriadi, A., Hardinoto, N., & Gustira, R. (2020). Development of Movement Activities Based on Play Approach in Order to Develop Skills Children's Basic Movement, 23(UnICoSS 2019), 117–121. <https://doi.org/10.2991/ahsr.k.200305.035>
- Dewi, R., & Verawati, I. (2021). The Effect of Manipulative Games to Improve Fundamental Motor Skills in Elementary School Students. *International Journal of Education in Mathematics, Science and*


- Technology*, 10(1), 24–37. <https://doi.org/10.46328/ijemst.2163>
- Ericsson, I., & Karlsson, M. K. (2014). Motor skills and school performance in children with daily physical education in school - a 9-year intervention study. *Scandinavian Journal of Medicine and Science in Sports*, 24(2), 273–278. <https://doi.org/10.1111/j.1600-0838.2012.01458.x>
- Fadilah, M., & Wibowo, R. (2018). Kontribusi Keterampilan Gerak Fundamental Terhadap Keterampilan Bermain Small-Sided Handball Games. *Jurnal Pendidikan Jasmani Dan Olahraga*, 3(1), 60. <https://doi.org/10.17509/jpjo.v3i1.7667>
- Fajrin. (2015). Mobile Gadget. *Jurnal Idea Societa*, 2(6), 1–33.
- Gultom, S., Baharuddin, B., Ampera, D., Fibriasari, H., & Sembiring, N. (2021). Profile of Student Physical Fitness Level of Sports Science Study Program: Relationship between Nutrition Status and Learning Achievement during COVID-19 Pandemic. *International Journal of Education in Mathematics, Science and Technology*, 10(1), 100–112. <https://doi.org/10.46328/ijemst.2115>
- Heijnen, J. H., Jussi Hanhimaki, Steiner, A., Abiko, T., Obara, M., Ushioda, A., ... Hinsley, F. . (2013).. *SSRN Electronic Journal* (Vol. 1). Retrieved from <http://www.eldis.org/vfile/upload/1/document/0708/DOC23587.pdf%0Ahttp://socserv2.socsci.mcmaster.ca/~econ/ugcm/3ll3/michels/polipart.pdf%0Ahttps://www.theatlantic.com/magazine/archive/1994/02/the-coming-anarchy/304670/%0Ahttps://scholar.google.it/scholar?>
- Hidayat, A. (2017). Peningkatan Aktivitas Gerak Lokomotor, Nonlokomotor Dan Manipulatif Menggunakan Model Permainan Pada Siswa Sekolah Dasar. *Jurnal Pendidikan Jasmani Dan Olahraga*, 2(2), 21. <https://doi.org/10.17509/jpjo.v2i2.8175>
- Imani, R. A., Muslihin, H. Y., & Elan. (2020). Permainan Bola Terhadap Perkembangan Gerak Manipulatif Anak Usia 4-5 Tahun. *PAUD Agapedia*, 4(2), 273–284.
- Kovačević, T., & Opić, S. (2014). Contribution Of Traditional Games To The Quality Of Students' Relations And Frequency Of Students' Association In Primary Education. *Croatian Journal of Education*, 16(Sp.Ed.No. 1).
- Kustiawan, A. A., Prayoga, A. S., Wahyudi, A. N., & Utomo, A. W. B. (2019). Upaya meningkatkan hasil belajar gerak dasar manipulatif dengan menggunakan modifikasi alat bantu pembelajaran sederhana di sekolah dasar Improve learning outcomes movement using the tools of simple manipulative learning in primary school. *Pendidikan Jasmani Indonesia*, 15(1), 28–32.
- Lemos, A. G., Avigo, E. L., & Barela, J. A. (2012). Physical Education in Kindergarten Promotes Fundamental Motor Skill Development. *Advances in Physical Education*, 02(01), 17–21. <https://doi.org/10.4236/ape.2012.21003>
- Miftah, M. (2014). Pemanfaatan Media Pembelajaran Untuk Peningkatan Kualitas Belajar Siswa. *Jurnal Kwangsan*, 2(1), 1. <https://doi.org/10.31800/jurnalkwangsan.v2i1.11>
- Moerianto, E., Valianto, B., & Dewi, R. (2020). Influence Game Method and Interest on the Basis of Motion of Learning Skills State Run SDN 105345 Sidodadi, 23(UniCoSS 2019), 158–161. <https://doi.org/10.2991/ahsr.k.200305.045>
- Nur, L., Giyartini, R., & Sumardi, S. (2020). Gross Motor Skills: Outbound Activities in Elementary Students. *JUARA : Jurnal Olahraga*, 5(1), 93–99. <https://doi.org/10.33222/juara.v5i1.781>
- Perwita, L. W., & Indrawati, T. (2020). Peningkatan Proses Pembelajaran Tematik Terpadu Menggunakan

- Model Cooperative Learning Tipe Talking Stick di SD. ... Pembelajaran Inovasi, *Jurnal Ilmiah ...*
- Rahma, A., & Kastrena, E. (2020). Peningkatan Kemampuan Gerak Manipulatif Melalui Permainan Bowling Botol. *Maempo*, 9(2), 48. <https://doi.org/10.35194/jm.v9i2.908>
- Restrepo Klinge, S. (2019). No TitleEAENH. *Ayan*, 8(5), 55.
- Rismayanthi, C. (2013). Mengembangkan Keterampilan Gerak Dasar Sebagai Stimulasi Motorik Bagi Anak Taman Kanak-Kanak Melalui Aktivitas Jasmani, 9(April).
- Ritonga, D. A. (2022). Development of Learning Variations to Improve Basic Jumping Skills and Play Approaches of Elementary School Students To cite this article : Development of Learning Variations to Improve Basic Jumping Skills and Play Approaches of Elementary School Students.
- Samsudin, & Nugraha, B. (2015). Learning Method and Its Influence on Nutrition Study Results Throwing the Ball. *Journal of Education and Practice*, 6(2), 130–138. Retrieved from http://proxy.library.vcu.edu/login?url=https://search.proquest.com/docview/1773217668?accountid=14780%0Ahttp://vcu-alm-primo.hosted.exlibrisgroup.com/openurl/VCU/vcu_services_page?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article
- Saputro, A. K., & Susilo. (2019). Model Pembelajaran Lempar Tangkap Softball menggunakan Media Pembelajaran. *Jurnal Penjakora*, 6(2), 75–81.
- Savitri, D. A. P., Kanca, I. N., & ... (2020). Pengaruh Model Pembelajaran Kooperatif Terhadap Hasil Belajar Bolavoli Ditinjau Dari Motivasi Belajar. ... *Pembelajaran ...*, 10. Retrieved from https://ejournal-pasca.undiksha.ac.id/index.php/jurnal_tp/article/view/3393
- Siregar, J., Damaiwaty, D. R., & Lubis, M. S. (2019). Pengaruh Bermain Lempar Tangkap Bola Terhadap Keterampilan Motorik Kasar Anak Usia 5–6 Tahun Di Tk Melbourn. *Jurnal Usia Dini*, 6(1), 1–9.
- Sutini, A. (2018). Meningkatkan Keterampilan Motorik Anak Usia Dini Melalui Permainan Tradisional. *Cakrawala Dini: Jurnal Pendidikan Anak Usia Dini*, 4(2), 67–77. <https://doi.org/10.17509/cd.v4i2.10386>
- Swadesi, I. K. I., & Kanca, I. N. (2018). Pengembangan Media Pembelajaran PJOK Berbasis ICT di SMP. *Seminar Nasional Riset Inovatif*, 274–281.
- Tandon, P. S., Tovar, A., Jayasuriya, A. T., Welker, E., Schober, D. J., Copeland, K., ... Ward, D. S. (2016). The relationship between physical activity and diet and young children’s cognitive development: A systematic review. *Preventive Medicine Reports*, 3, 379–390. <https://doi.org/10.1016/j.pmedr.2016.04.003>
- Ulfa, A., & Kamtini. (2018). Pengaruh Kegiatan Bermain melempar bola Terhadap Perkembangan motorik kasar Anak Usia 1-3 Tahun. *Jurnal Bunga Rampai Usia Emas*, 4(2), 40–44.
- Ulfiansyah, F. N., B, K. S., & Kriswantoro. (2015). Pengaruh Latihan Reaksi Bervariasi Dan Tetap Terhadap Kecepatan Reaksi Penjaga Gawang. *Unnes Journal of Sport Sciences*, 4(2), 18–22.
- Verawati, I., & Dewi, R. (2019). Media Development Video Tutorial Model Big Ball Game to Improve Basic Manipulative Movement Skills, 3134–3142.
- Verawati, I., Dewi, R., & Ritonga, D. A. (2021). Development of Modification of Big Ball Game with Play Approach in Order to Develop Basic Movement Skills in Elementary School Students. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 4(2), 3186–3192. <https://doi.org/10.33258/birci.v4i2.2051>

- Yuntoto, S. (2015). Pengembangan Aplikasi Android Sebagai Media Pembelajaran Kompetensi Pengoperasian Sistem Pengendali Elektronik Pada Siswa Kelas Xi Smkn 2 Pengasih. *Desy Fatmawati*, (september), 1–8.
- Yuwono, C., Rahayu, T., Sulaiman, S., & Rustiadi, T. (2021). Increasing Students' Gymnastic and Rhythmic Activities through Locomotor, Non-locomotor, and Manipulative Movement Patterns. *International Journal of Education in Mathematics, Science and Technology*, 10(1), 57–73. <https://doi.org/10.46328/ijemst.2164>

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