Effectiveness of D-Mat on Improving Basic Jumping Motions in Early Children in Palembang

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Article Info	Abstract
	Mastery of basic movements must start from an early age, because mastering basic movement abilities is an important foundation for children to be able to be involved in many kinds of physical activities in the future. This research is related to the basic motion of jumping. The aim of this study was to determine the effectiveness of D-Mat in increasing basic jumping motion in early childhood. This type of research is experimental research by providing treatment in the form of a game method with D- Mat in early childhood. The sample used in this study is the total number of early childhood children in early childhood education. The data were obtained from the results of the pretest and posttest. The research sample consisted of 4-5 years old children in TK Negeri Pembina 4 and TK Kurnia Makmur Palembang totaling 30 people. Data analysis techniques using the t test. Based on the results of the research based on the t-test calculation, the value of fcount <ftable or 4.29 <1.693 means that Ho is rejected and Ha is accepted. This shows that the child's final ability is better than before using the D-Mat. It can be concluded that D-Mat is effectively used to improve basic jumping motion in early childhood in Palembang. It is suggested that the D-Mat mat can be used in physical activities as well as learning because the D-Mat contains pictures of letters and numbers.

INTRODUCTION

Early childhood are individuals who are different, unique, and have their own characteristics according to their age stages. Early childhood is a golden age in which stimulation of all aspects of development plays an important role for further developmental tasks (Komaini, 2018). Early childhood is a child who likes to play. According to Deterding (2018), playing is children's work, but games that are suitable for children's development need attention. According to Payne & Isaacs (2012), Based on this, it is explained that playing is very important for the development of children's health, because it will affect children's welfare. Especially notable is its effect on communication skills, intelligence and motor development. The game is an activity that aims to acquire certain skills by making someone happy. Playing provides stimulation for optimal child development. One of the potential developments possessed by children can be developed by providing a stimulus. Stimulus is something that needs attention for early childhood development. Stimulus response is a learning process which is a response from someone to a stimulus they face. The stimulus is repeated until you get the same and correct response continuously. Eventually certain habits and behaviors will emerge (Wicaksono et al., 2017). motion and song are some of the most fun activities for early childhood (Sukmawati et al., 2021), Through various kinds of fun physical activities, children get a positive impact, especially on the growth and development and physical fitness of children. Learning motion can be interpreted as changes in place, position, speed of the body or parts of the human body that occur in a dimension of space and time and can be observed objectively. Motion learning is a series of processes to perfect movement skills related to training and experience that develop into motor development (Dliss et. al, 2020). Learning motion can be interpreted as changes in place, position, speed of the body or parts of the human body that occur in a dimension of space and time and can be observed objectively. In this study the authors only focused on locomotor motion. According to Kail & Cavanaugh (2010). "locomote is an ability to move around in the world". Locomotor is the ability to move in the world. As long as humans live in this world, they will certainly move, except for people who have a disease disorder that causes their bodies to be unable to move. Locomotor skills involve transporting the body in all directions from one point to another. Examples are: crawling, walking, running, hopping, hopping, galloping, swimming. (Department of Education, 2013).

The success of locomotor movements in achieving targets requires skills in the perception and execution of movement patterns that are efficient and accurate (Panteli et al., 2014). Locomotor motion according to Mahendra (2000) is often called traveling, defined as moving from place to place, such as walking, running, jumping and jumping. This skill is considered the most basic locomotor skill, because it is a skill that develops with development and is more functional in nature. Jumping is the movement of moving places using one foot as a pedestal while jumping uses two legs as a pedestal. The definition of the form of basic motion exercises jumping is the movement of lifting the body from one point to another using two or one leg as a fulcrum. Jumping is a basic movement that is used regularly

in sports. Jumping consists of 2 namely horizontal and vertical jump. Jumping movements are needed in sports such as long jump, high jump, and game sports, namely basketball, volleyball, and other sports (Barker, 2018). According to Cherly A (2004) "jumping is a gross motor skill". According to Balyi et al., (2013). "Jumping is a movement of pushing oneself off the ground with one or two feet". The jump consists of three phases namely pushing, airing and landing (Bakker & Moes, 2007). Jumping not only using two legs but jumping also using one leg. The single leg jump was implemented as an initiative and experiment (Zhu & Kawamura, 2010).

Much previous research has raised problems solving in improving basic jumping motions in various ways or methods, games. Several types of games owned by children affect the types of play activities carried out by children. Educators and parents should provide a variety of children's play tools so as to allow children to play in various ways and types of game. The more play tools available, the more active children play. The activeness of children in playing affects physical fitness. This shows that the game model is very suitable for children in improving skills. Currently technology-based research has become the focus of many research works in recent years. One study according to Gallud et al. (2021) that learning methods that are enhanced by technology and game-based can be applied. In this study the researchers tried to use D-Mat. Like previous research, the D-Mat is a tool used to improve basic locomotor movements in mentally retarded children. Like research that has been done before. Previous research

entitled "Jump Movement Skills Patterns Among Indonesian Mentally Retarded Children Using D-Mat" (Septaliza, Hanif, Yusmawati, et al., 2022). There is a similar study entitled The Effect of Jumping and Hopping Training Models Using Digital Mattresses for Children with Intellectual Disabilities (Septaliza, Hanif, & Yusmawati, 2022). From this study it shows that D-Mat has a positive impact on increasing basic movements in children with disabilities. The D-Mat is a mat designed to improve basic jumping motion. Currently, D-Mat only focuses on jumping with 2 legs and jumping with 1 leg.

Figure 1. Matras Digital (D-Mat)

The form of basic locomotor movement training for mentally retarded children on the digital mat only focuses on jumping with 2 legs and jumping with 1 leg. This type of jumping movement is designed in such a way into the digital mat with the aim of doing an exercise that is fun, not boring and more efficient. It is hoped that the jumping exercise using d-mat for early childhood can help children improve their basic jumping skills. Based on this, researchers want to conduct a

study to see the impact of using d-mat on the basic movement of jumping in early childhood.

METHODS

1) The research method used was quasi- experimental with the One Group Pretest and Posttest Design. This study used a sample of 30 early childhood children aged 4-5 in TK Negeri Pembina 4 and Kurnia Kindergarten. The instrument used is a jump test. This basic movement instrument has been validated by experts. The jumping test is a measuring tool used to determine the basic movement abilities of jumping. This test is developed from 2- foot and 1-foot jumping movements. The jump test instrument has been compiled and tested for validity and reliability with an index of $r = 0.874$ which can be declared valid and reliable to use. Implementation of the jumping test: the testee is at the start line, after the signal "yes" or the whistle is sounded, the child starts jumping using 2 legs and jumping using 1 foot alternately, carried out up to 2 repetitions for 2-foot jumps and 2 times reps for alternating 1-foot jumps. The following is a picture of the implementation of the jump test (Septaliza, 2022)
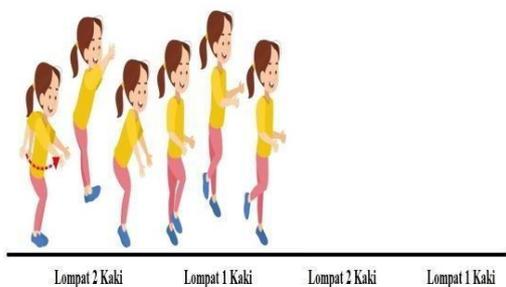
Figure 2. Implementation of the Jump Test.

The assessment is taken for the child's best movement in jumping, for the basic jumping motion test by giving a score in the form of a True-False test (True

/ False). To determine the score of this instrument with a value or score, the true value is 1 (one) and the wrong value is 0 (zero).

Table 1. Assessment of Jumping Movement

No	Assessment Aspects	Mark			
		Jump 2 Feet		Jump 1 Feet	
		Correct	incorrect	Correct	incorrect
1	Foot Stance				
2	Knee Movement				
3	Hip Movementl				
4	Hand movements				
5	Posture				
6	Harmony				
Maximum Score: 12					

Based on the table above, the basic jumping motion assessment is divided into 2 jumps using 2 feet and 1 leg jump where the maximum score is 12. After the test is held (pre test/post test). Furthermore, data analysis using t-test. To test the significance of the difference in the average X and Y values, the t-test calculation formula is used.

RESULT

The research results were obtained from tests and measurements of jumping instruments where the assessment was based on the truth value of the motion. The motion correctness value includes the following elements: 1) leg attitude 2) knee movement, 3) hip movement. 4) body movements, 5) hand movements, 6) Alignment. The effectiveness test was carried out 16 meetings 14 times for treatment and 2 times for pretest and posttest data collection in the experimental control group. In this effectiveness test using 30

research subjects. The results of testing the effectiveness of using D-Mat on basic jumping movements in early childhood. After the raw data is obtained then the value is made into a score using the T-Score. The following is the pre-test and post-test results

Table 1. Descriptive Statistics

Class	Mean	N	Std. Deviation	Minimum	Maximum	Range	Median
Pre	58,06	30	21,83	16,67	100.00	83,33	58,33
Post	82,22	30	13,79	58,33	100.00	41.67	87,50

The table above shows that: the results of the pre-test with 30 research subjects obtained a maximum value of 100, a minimum value of 16.67, an average value of 58.06 and a standard deviation of 21.83, while for post-test results with 30 research subjects a maximum value of 100 is obtained, a minimum of 5.88, an average value of 82.22 and a standard deviation of 13.79. Finding $ttabel$ with $\alpha = 0.05$ and dk = 29 ; t 0.95 29 = 1.69. If $thitung = 4.29 >$ $ttabel = 1.69$. Thus there is a significant difference in average between the pretest and posttest results. Based on the calculation above, it is obtained $thitung = 4.29$ while $ttabel = 1.69$. So it can be concluded that $thitung > ttabel$, it means that h1 is accepted and h0 is rejected. This shows that the child's final ability is better than before using the D-Mat. This shows that D-Mat is effectively used to improve the basic movement skills of jumping in early childhood. In previous research D-Mat was also used to improve basic movement in mentally retarded children aged 7-12 years. The results provide an increase in these children with special needs.

CONCLUSION

The d-mat is designed to facilitate children's basic jumping movements with the help of light and sound stimulation. In line with previous research that children can be trained using ocular training, where according to sugiarmin & baihaqi (2013) "ocular training, namely following the movement of a light with the eyes and various activities that increase perception/capacity and use of various forms". So the children will make a jump following the light signal / color light that will light up. The colors used in this mat are white, red, blue and green. Selection of striking colors on the d-mat so that children can recognize colors. Based on the opinion of caniago & zulmiyetri (2019), "everyone is attracted to striking colors". Therefore, the selection of flashy colors is expected to increase children's knowledge of colors and increase interest in jumping movements. D-mat is designed using modern technology. D-mat products that really help students in increasing children's physical activity. D-mat can be active and play media fun because it is equipped with music with children's songs during its implementation. The d-mat can be done anywhere because of its foldable shape. The most important thing is that there is An electric current source to operate the d- mat. Another advantage is that the d-mat has a low electric power of 24 watts. This d-mat product is a source or training medium for early childhood in recognizing and mastering jumping movements and in increasing physical

activity (septaliza, hanif, yusmawati, et al., 2022). The results of research conducted to prove the usefulness of the product in early childhood. This shows that the use of d-mat is effectively used to improve the basic movement skills of jumping in early childhood.

CONCLUSION

Based on the results of data analysis and discussion, it can be concluded that the use of D-Mat has a very significant influence on the basic jumping ability in early childhood. This shows the effectiveness of using D-Mat in increasing basic jumping motion in early childhood. It is hoped that the D-Mat that has been developed by researchers can contribute to teachers and trainers as a suggestion to improve basic locomotor jumping. D-Mat can be used in physical activities as well as learning because the D-Mat contains pictures of letters and numbers. This research needs to be refined with further research so that everyone can use D-Mat as an effective medium to improve all basic movement abilities.

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